"Methodenstreit" and Political Science

The Methodological War at the Beginning of the 21st Century between the Scientistic Establishment and the Phronetic Perestroikans[1]

Abstract

This monograph contains a *critical evaluation* of the present *state of research* within political methodology and a *classification* of the current discussion into a *methodological development* that has been ongoing for two millennia. It furthermore offers some *suggestions* for the *future development* of political methodology.

The focus of the work lies on the dispute known as the "Methodenstreit". Its beginnings date back to the 19th century, and at the start of the 21st century it erupted into what can justifiably be called a "methodological war".

Firstly, an *ad fontes reconstruction* of *naturalism*, *positivism* and *scientism* is undertaken by means of methodical books and classical literature, demonstrating that the issue lies not with the *mainstream* but with the *establishment*. Then, the opposite view is presented, using the example of the *phronetic perestroikans*, who undertook the latest great rebellion against the establishment.

The limits of *applied methodologies* are identified, both of the scientistic (*normative rational choice theory*) and of the phronetic kind (*applied phronesis*). Furthermore, a case is made for the need for a *genuinely practical* (normative, pragmatic and technical) methodology that is *complementary* to an *empirical* (descriptive, explanatory and prognostic) one.[2]

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[2] Background: this monograph was accepted as a dissertation at the Faculty of Economics and Social Sciences at Heidelberg University. Supervisors: Klaus von Beyme and Michael Haus. The monograph is currently only available in German, exceptions: abstract, introduction and charts in this PDF-Version are in English. It was published in three media formats:
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1. Introduction: Methodology and Political Science

1.1 Starting points: methodological disputes within political science, past and present

1.1.1 Relevance and instrumental nature of methodology for science

The central relevance of scientific methodology lies in the fact that methodology alone establishes and legitimizes a demarcation line between science and other forms of cognition. Science is the place where scientific knowledge is generated. In antiquity, methodology undergirded the transition from myth to logos, and still today it makes it possible to distinguish between scientific knowledge and other forms of knowledge that are not scientifically, i.e. not methodologically and not systematically, generated.

Methodology is both the tool and the object of science. As a tool, it serves to generate content in the form of knowledge. Methodology itself is also the subject of scientific research, critically evaluated and developed further. Methodology delimits the boundaries of "science". Note that the terms "knowledge" and "science" really belong together. In other languages (except in Latin, where the word "*scientia*" means both science and knowledge) this is not as obvious as in German, where we have *Wissenschaft* (science) and *Wissen* (knowledge): for example, there are two words in English, "science" and "knowledge", and in French "*science*" and "*savoir*" or "*connaissances*". Scientists therefore generate knowledge within scientific institutions with the help of various scientific tools. So the scientific methodology establishes a demarcation line between scientific knowledge and other forms of knowledge. However, this line is constantly shifting due to the methodological developments, and indeed the limits of scientific knowledge are ceaselessly widening or narrowing.

But in each individual field, methodology also plays a role in aspects other than knowledge generation. It is involved in the training and socialization of professional representatives, in recruitment to scientific institutes, and, later, in the promotion of research, for example in the allocation of research funds in scientific institutes or in enabling publications: "What becomes clear in this context is the extent to which methods currently serve as identity markers for various fields, including as gatekeepers for doctoral students embarking on comprehensive exams and dissertation research, graduating PhDs seeking jobs, junior faculty seeking promotion and tenure, and all seeking research funding, opportunities to present work in conferences, and publications outlets for research. And the issues arise as well in teaching, curricular design, and textbooks contents" (Yanow/Schwartz-Shea 2014a [2006]: 421-422). The methodology thus leads internally to the emergence of schools and of professional boundaries. Rejecting these disputes as fetishism would mean obscuring the various actual or alleged incommensurabilities between different academic schools and traditions as well as the constructed individual and professional identities.

So, methodology basically has two different meanings. The endogenous significance of methodology lies in distinguishing scientifically legitimized knowledge from other forms of knowledge. The exogenous importance of methodology governs the socialization and co-optation of new members in the science system, further contributing to the promotion of research and the development of society.

I have nothing said about the relevance of, for example, lifeworld, religious or ideological forms of knowledge generation; they are neither appraised nor devalued. The pejorative devaluation as "pseudoscience" of findings that are not reached by following the methodological requirements of a school, for instance in Critical Rationalism, is widespread. Findings of scientists from other schools are also subsumed under pseudoscience. Furthermore, within methodological studies the value of science cannot be discussed, and arguments for or against a scientification of politics cannot be examined.

This study discusses the instrumental character of methodology for the generation and legitimation of knowledge (endogenous meaning). Its relevance to the socialization of researchers and the promotion of research (exogenous importance) is not addressed.

1.1.2 Foundations of scientific research: axiology, epistemology, methodology and ontology

Epistemology, methodology, and ontology constitute the "sacred trinity" of science, which is particularly addressed within the philosophy of science: "'[M]ethodology' often appears as one member in a trio of the philosophy of science, the two other being 'ontology' and 'epistemology'. These are the three musketeers of metaphysics" (Moses/Knutsen 2012 [2007]: 4). For the individual sciences, the methodology, in particular the methodical level (Chart 1, p. 21), is the favorite child, while epistemology is accepted as a necessary evil. Ontology is clearly the stepchild and was often dismissed as obsolete by many (neo-) positivist and naturalistic philosophers of science or scientists in the individual sciences, especially in the 20th century. Since the 1990s, this has been changing very slowly, including in political science (Hay 2011 [2009]).

Jonathon W. Moses and Torbjørn L. Knutsen analyze epistemological, methodological and ontological issues in terms of their relevance to political science research and, above all, consider them with epistemic glasses. In their book, "Ways of Knowing. Competing Methodologies in Social and Political Research" (Moses/Knutsen 2012 [2007]), this is clearly noticeable in the structure and the discussion. Moses and Knutsen try to objectively represent both positions, they speak of naturalism versus constructivism; that is, both the possibilities and the limitations of the two methodologies are analyzed. Their second important goal is to build methodological bridges (Moses/Knutsen 2012 [2007]: 302) between naturalism and constructivism.

Axiological questions are just as relentlessly discussed in the *„Methodenstreit"*. Therefore, in some methodology books they are quite rightly cited alongside epistemological, methodological and ontological questions (Creswell 2013 [1998]: 21). The main issue is whether there is a separation between "is" and "ought" (*Sein* and *Sollen*). Scientistic scientists affirm this by referring to Weber (2011 [1904] and 1973e [1919]), while interpretivists and perestroikans deny this. Furthermore, the question of to what extent value-laden (scientific) research exists or how values influence research as knowledge-guiding interests (Habermas 1968c) remains controversial. In general, axiological questions are about how to deal with questions of value and what role practical questions should play.

The scientistic scientists, who also operate under other names, such as social scientists, naturalists, positivists, or neo-positivists, concentrate primarily on the methodical level in the narrower sense (Chart 1, p. 21) and treat the philosophical foundations

rather as a stepmother. These questions, which were in the foreground in the second half of the 19th and the first half of the 20th century, have been pushed into the background. At the forefront came arguments at the methodical level, more precisely between the representatives of quantitative and qualitative research.

The importance of the philosophical level is again emphasized not only by the phronetic perestroikans but also by the interpretivists: "Treating methods as self-standing 'tools' apart from the pre-supposed ontological and epistemological positions that inform and shape them and their themes" (Yanow/Schwartz-Shea 2014a [2006]: 425, Bevir 2010 [2008], Moses/Knutsen 2012 [2007], Bevir/Rhodes 2016a, Bevir/Blakely 2016).

In this work, the emphasis is on methodology rather than the methods level, so that all issues are considered through philosophical (axiological, epistemic, methodological and ontological) glasses. All questions are discussed on ten vertical levels (Chart 1, p. 21) and on three horizontal levels (Chart 2, p. 22).

1.1.3 The Aristotelian Organon: possibilities and limitations of scientific methodology

Plato and Aristotle can be described as the two founding fathers of political science. This applies both to content-related questions of the field as well as to the rather formal, methodological questions that are the subject of this work. Aristotle enjoys a higher reputation among empirically-oriented political scientists.

From a methodological point of view, Aristotle's Organon[3] can be considered the first book on methodology. In it, Aristotle systematically discussed all rational or scientific tools with which the leap from myth to logos was made in ancient times – impartial, objective and factual, *sine ira et studio*. He explored in particular the possibilities and limits of scientific methodology or of tools in the broader sense (axiological, epistemic and ontological conditions) as well as in the narrower sense (categories, logic (syllogism), dialectics, rhetoric).

1.1.4 Extensive methodological discourses and an unmanageable variety of scientific tools

Today, in the early decades of the 21st century, we have an unmanageable variety of scientific tools (concepts, propositions, theories, logics, argumentations, methods and methodological approaches) and of discourses on the foundations of scientific methodology, theory and prerequisites for scientific work (e.g. on tasks, limits, assumptions, criteria and characteristics of scientific research), both within the philosophy of science and within the social sciences, not least – or especially – in political science. Several different approaches, as well as attitudes, can be observed in political science at the start of the 21st century:

A. ignorance of methodological questions, "just do it" pragmatics
B. methodological grunt work in normal mode within different methodological traditions and schools

[3] *Sources*: Aristotle 1920 [4th century BC], see Aristotle: https://archive.org/details/AristotleOrganon, access 12.12.2018.

C. methodological wars in revolutionary mode

D. pluralistic habitus and reductionist practices.

A. Ignorance of methodological questions, "just do it" pragmatics

Since the emergence of modern social sciences, methodological questions have been regarded by many empirical scientists as a necessary evil, if not as superfluous. Probably the vast majority of political scientists hold a pragmatic attitude ("just do it") coupled with an ignorance of methodological questions: "Their motto is, once again: 'just do it' (Barry 1970, v; Dryzek 2005)" (Goodin 2011b [2009]: 29). Goodin also states: "But the vast majority of political scientists whose main concern is generally nonplussed. They do so in the same way they would have done under any alternate regime" (Goodin 2011b [2009]: 30-31).

Those who wish to extol the virtues of this attitude can, however unfoundedly, even quote a classic such as Weber: "All this gives rise to the wish that the current fashion for every beginner's work to be adorned with epistemological inquiries will very soon die out"[4] (Weber 1973b [1903-1906]: 127, my translation). This remark referred to a footnote to Dr. Biermann. Weber is considered a classic in the social sciences, because he made lasting contributions to the methodology of the social sciences, and also because he implemented the methodological guidelines in his empirical work. One should therefore not overestimate these critical remarks and pay close attention to the context of their creation and use.

B. Methodological grunt work in normal mode within different methodological traditions and schools

"Normal" methodological grunt work takes place within different methodological traditions, or in schools within these traditions; without this work, the enormous methodological progress of the last century would not have been possible. The platonic-galilean tradition, which maintains a methodological reductionism and is very homogeneous, is usually introduced first. This is followed by the aristotelian tradition, which represents a methodological pluralism and is very heterogeneous. Only one school from the aristotelian tradition, the perestroikans, is discussed in detail in this work. The distinction made between the platonic-galilean and the aristotelian tradition, or in other words between methodological reductionism and methodological pluralism, builds on the work of Georg Henrik von Wright (1971) and was further developed by me elsewhere (Lauer 2013).

"The Oxford Handbook of Political Methodology" (Box-Steffensmeier/Brady/Collier, 2010a [2008], hereinafter referred to as "Political Methodology") currently offers the most outstanding overview of the platonic-galilean tradition. The naturalistic, positivist, or scientistic methodology of the discipline is oriented towards the natural sciences, understands as part of the social sciences and works above all with experiments, logical-mathematical argumentation methods, quantitative and qualitative-mathematical (qualitative positivistic) methods as well as with models (in particular rational choice models).

[4] "[D]ies alles läßt den Wunsch entstehen, es möge die heutige Mode, daß jede Anfängerarbeit mit erkenntnistheoretischen Untersuchungen geziert werden muß, recht bald wieder aussterben" (Weber 1973b [1903-1906]: 127)

There has been criticism of this scientistic, platonic-galilean tradition since the 19th century from scholars leaning on the humanities, on human sciences, or on linguistic, hermeneutic, (post) structuralist or interpretative lines of argumentation as well as on preferred qualitative-interpretative methods and methodological approaches (Dilthey 1922 [1883], Rothacker 1926, Rickert 1910 [1896], Windelband 1900 [1894], Gadamer 2010 [1960], Garfinkel (1967), Glaser/Strauss 1967, Foucault 1971 [1966] and 1995 [1969], Geertz 1983 [1973]), Giddens (1984 [1976]), Bodammer 1987, Denzin/Lincoln 1994, Creswell 2013 [1998], Flick/von Kardorff/Steinke 2015 [2000], Blatter/Janning/Wagemann 2007, Yanow/Schwartz-Shea 2014 [2006], Bevir/Rhodes 2016a).

At the beginning of the 21st century, a new methodological school within the aristotelian tradition stood up in opposition to the scientistic, naturalistic methodology. This school sees itself as a phronetic political or social science (Flyvbjerg 2001 and 2006, Schram/Caterino 2006) or as real social science (Flyvbjerg/Landman/Schram 2012a). The phronetic scientists take arguments from the aristotelian tradition, but they are also part of the perestroika movement and argue for an independent, real social science. An overview of the diversity of the perestroika movement is provided in the book "Perestroika! The Raucous Rebellion in Political Science" (Monroe 2005). This book also presents an evaluation of the movement. A further evaluation followed in Perspectives on Politics in 2015 (Gunnel 2015a and 2015b, Farr 2015, Laitin 2015, Monroe 2015 and Schram 2015).

It must be emphasized that the "normal", grunt work is almost exclusively done within the two traditions. The representatives of these two traditions usually do not engage in constructive engagement with representatives of the other tradition: instead, their respective grunt work leads them to an unproductive methodological war.

C. Methodological war in revolutionary mode. The opponents in the *„Methodenstreit"* within political science at the start of the 21st century: scientistic political scientists versus phronetic perestroikans

Disputes within political science can inflame into religious wars with Manichean features, as Klaus Gustav Heinrich von Beyme (2000 [1972]: 142) diagnoses. He was referring to the methodological disputes during the so-called "behavioral revolution" in the 1950s and 1960s and the "rational choice revolution" in the 1970s. Today religious wars within science have unfortunately not disappeared. Robert Edward Goodin, a representative of the scientistic establishment, also notes in his "State of the Discipline, the Discipline of the State" that disputes within political science often take a "Manichean, Good versus Evil form" (Goodin 2011b [2009]: 10). Unfortunately, this also applies to the arguments about the adequate methodology.

The scientistic scientists (Chart 3, p. 23) assume that their counterparts cannot work scientifically: "American scientists, however, often have reduced all the competing approaches [all approaches except the rational choice approach] to the status of inferior journalism" (von Beyme 2000 [1972]: 148, my translation[5]). In the same vein, the disciplined political scientists also work with other, subtler insults: colleagues are

[5] "Amerikanische Wissenschaftler haben aber vielfach alle konkurrierenden Ansätze [gemeint sind hier alle Ansätze außer dem Rational-Choice-Ansatz] auf den Status eines inferioren Journalismus herabgedrückt" (von Beyme 2000 [1972]: 148).

not regarded as scientists, but only as theorists. Furthermore, these theoreticians, who are also described as happy and undisciplined, are not classified as being within the scientific departments of the social science faculties, but in the humanities: "Political theory is an interdisciplinary endeavor whose center of gravity lies at the humanities end of the happily still undisciplined discipline of political science"(Dryzek/Honig/Philips 2009: 62; see ibidem political scientist versus political theorist p. 63).

The rejection and devaluation of other axiological, epistemic and ontological assumptions as well as methodological procedures is the strategy of the scientistic scientist in this scientific war. Second, there is also a rejection or at least a devaluation of linguistic-hermeneutical or philological-interpretive arguments, methods and methodological approaches. "Political science is the only social science in which the history of past theories plays a special role. 'History of dogma' in economics, on the other hand, became a secondary subject for 'fairy tale examinations' – in addition to the hard business of quantifying economics"[6] (von Beyme 2002: 14, my translation). This subdivision is especially strong in economics, but it goes to the heart of a division that also exists in political science, especially in the United States. Just as economic history tends to be investigated in the history departments, scientistic political scientists also try to deport the history of ideas, political philosophy, and generally all "theoreticians" who work "only" with linguistic-interpretive methods of argumentation and qualitative-interpretative methods, into the humanities. Only those who look for causalities may claim the status of "scientist".

The opponents of the scientistic scientists (the humanities and cultural scientists, constructivists, anti-positivists, hermeneutics, interpreters, structuralists or post-structuralists, phronetic perestroikans, human scientists; Chart 4, p. 24), in turn, react with exaggerated and in part unjustified criticism. While it is true that the scientists often do not take their opponents seriously or ignore them altogether, the interpretivists tend to build up straw men that they can then easily knock down. Not only do they reject the positivist and naturalistic assumptions for exploring the political and social world, but they also deem the logical-mathematical tools to be unsuitable. These are, in essence, the main arguments for the demand for a turnaround in human and social sciences and the necessity of a post-positive political science.

Furthermore, they point in particular to the alleged lack of public relevance (Flyvbjerg, 2001), method-driveness (Green/Shapiro 1994) or unworldly self-centeredness in the form of methodological scholasticism (Mead 2010). It is not surprising, then, that Bent Flyvbjerg, one of the representatives of the perestroika movement (Flyvbjerg 2006: 56), speaks of a "science war" (Flyvbjerg 2001: 1).

The dispute, which has now degenerated into a methodological war, emerged in the nineteenth century because of the orientation of some scientists in the social sciences towards the natural sciences, and others' rejection of such aspirations.

The Kuhn narrative, i.e. the use of the philosophy of science of Thomas Samuel Kuhn (1962) to explain progress within the sciences, has acted like a fire accelerator, since

[6] "Die Politikwissenschaft ist die einzige Sozialwissenschaft, in der die Geschichte vergangener Theorien eine besondere Rolle spielt. 'Dogmengeschichte' in der Ökonomie wurde dagegen zum Nebenfach für 'Märchenklausuren' – neben dem harten Geschäft der quantifizierenden Ökonomie" (von Beyme 2002: 14).

both sides use it not only to prove their own superiority but also to present their opponents as being outdated. Thus, a meaningful debate between scientists with different theoretical assumptions becomes fundamentally impossible from the outset.

It is astonishing to witness scientists go from "normal" academics to religious warriors when they act as revolutionary standard-bearers. They then have only one goal: to kill all methodological opponents by all available means.

In my opinion, a drive for money or power can also be identified in the revolutionary mode, because scientists are also always fighting for material resources to gain recognition, publication and career opportunities. This is largely the case because the existential, socio-economic situation of the overwhelming majority of political scientists has been very precarious since the emergence of the field. Already at the start of the twentieth century, Weber spoke in his well-known speech "Science as a Vocation" of the fact that the situation of many scholars and scientists in Germany, just as in the USA, was "as precarious as any proletarian existence" (Weber 1973e [1919]: 584 [526], my translation[7]). Aristotle, on the other hand, did not personally face such existential or economic problems.

"If social science were viewed less as a prizefight between competing theoretical perspectives, only one of which may prevail, and more as a joint venture in which explanations condition and augment another, the partisan impulses that give rise to methodologically deficient research might be held in check" (Green/Shapiro 1994: 204). Unfortunately, this call from the last century has remained a pious wish, as the methodological war at the start of the 21st century between the scientistic scientists (King/Keohane/Verba 1994, Brady/Collier 2010 [2004], Box-Steffensmeier/Brady/ Collier,2010a [2008]) and the phronetic perestroikans (Flyvbjerg 2001, Schram/Caterino 2006, Flyvbjerg/Landman/Schram 2012a), the interpreters (Rosenthal 2014 [2005], Kleemann/Krähnke/Matuschek 2009, Yanow/Schwartz-Shea 2014 [2006], Bevir/Rhodes 2016a, Münch 2016) or the qualitative researchers (Denzin/Lincoln 1994, Creswell 2013 [1998], Flick/von Kardorff/Steinke 2015 [2000], Blatter/Janning/Wagemann 2007) attests.

Because these argumentations are delivered in revolutionary mode, there are many misunderstandings, whereas sober, rational discussions would bring the parties closer. The polarizing approach to methodological questions within the social sciences differs very clearly and unfavorably from Aristotle's approach. This is not only borne out by the violence of the words "*Methodenstreit*", *"Positivismusstreit*" (Adorno 1976, Falter 1982, Keuth 1989, Topitsch 1967), or "science war" (Flyvbjerg 2001: 1). Since the first methodological disputes in the 19th century arose in the German-speaking world, the word „*Methodenstreit*" has found its way into the English language, where it is still used today quite idiosyncratically, in lower case and grammatically incorrectly: "[H]arking back to the method dispute" (Hawkesworth 2006: 152). Other Anglo-Saxon authors also use the German word (Caterino/Schram 2006: 11).

D. Pluralistic habitus and reductionist practices

Pluralism is a value that hardly a political scientist calls into question today, even if, like the scientistic and phronetic reductionists, they practice exactly the opposite. In

[7] "ähnlich prekär wie jede 'proletaroide' Existenz" (Weber 1973e [1919]: 584 [526]).

short, the adversaries in this methodological war constantly display a *pluralistic habitus*, even if they daily pursue or implement a *reductionist agenda*.

The tendency to a camp mentality is rejected beyond the boundaries of one's own camp (Green/Shapiro 1994: 204). The tendency of others to debate in an either-or-mode is constantly lamented. This is true not only of the two great disputes, the one the Neo-Marxists (Caucus for a new Political Science) began in the 1960s and 1970s and the one the perestroikans started in the early 21st century, but also of many other disputes: "[T]here is a remarkable penchant for representing the options in 'either-or' fashion. Behavioralist or traditionalist, structure or agency, ideas or interests, realist or idealist, rationalist or interpretivist: you simply have to choose, so we are constantly told. On all those dimensions and many others as well, the only proper response is to refuse to choose. Respond insistently, 'Both!'" (Goodin 2011b [2009]: 10). Goodin also conceded that the perestroikans propagate a pluralistic ideology: "This is the official ideology, if not always practice, of the perestroika movement" (Goodin 2011b [2009]: 10, footnote 19 with reference to Schram 2003: 837).

However, this pluralistic aim is not always applied in the eleven-volume series "The Oxford Handbook of Political Science" (Goodin 2011a [2009]), which was supervised by Goodin as general editor. In particular, the volume "Political Methodology" (Box-Steffensmeier/Brady/Collier 2010a [2008]), which is most relevant to this investigation, practices methodological reductionism: only the logical-mathematical methodology is presented in detail. The linguistic-interpretive methodology for the interpretation of meaning-making or sense-making is completely ignored. In this volume, the declared aim of which is to provide an overview of the entire methodology of political science, only methodologies that apply causal thinking are included. Qualitative-mathematical methods are explained, but no qualitative-interpretative methods, although there a wealth of such methods has been used for decades (Denzin/Lincoln 1994, Flick/von Kardorff/Steinke 2015 [2000], Blatter/Janning/Wagemann 2007, Creswell 2013 [1998], Yanow/Schwartz-Shea 2014 [2006], Bevir/Rhodes 2016a).

On the other side, Bent Flyvbjerg (2001) also justifies his plea for a phronetic, real social science in part by pointing to the fundamental difference between natural and social sciences. Furthermore, he does not tire of emphasizing the practical insignificance or irrelevance of quantitative methodology, uncovering the limits of deductive reasoning and propounding the superiority of inductive reasoning. At the end of the first part of his book, he suddenly states: "To amputate one side in these pairs of phenomena into a dualistic 'either-or' is to amputate our understanding. Rather than the 'either-or', we should develop a non-dualistic and pluralistic 'both-and'. Hence, we should not criticize rules, logic, signs, and rationality in themselves. We should criticize only the dominance of these phenomena to the exclusion of others in modern society and in social science. Conversely, it would be equally problematic if rules, logic, signs, and rationality where marginalized by the concrete, by difference, and by the particular. This later problem, however, is presently far less pressing than the former" (Flyvbjerg 2001: 49). One then wonders, why the plea for a phronetic revolution, which supposedly alone can enable only a real social science? Would a simple adjustment not have sufficed?

1.2 Main issues

This work looks at three extensive questions:

1.2.1 The „Methodenstreit" or the methodological war within political science

A. Who are the protagonists in the methodological war?

B. Which different axiological, epistemic, methodological or ontological conditions or approaches do the protagonists prefer?

C. What are the most important concepts and issues in the „*Methodenstreit*" at the beginning of the 21st century?

D. What shortcomings and misunderstandings determine the debate?

E. Which concepts and procedures are best suited to reconstruct the development of methodology?

1.2.2 Overcoming the methodological war

A. How can the methodological war be overcome?

B. What effects do axiology, epistemology and ontology have on methodology?

C. Which philosophical (axiological, epistemic and ontological) assumptions can be partially identified as implicit assumptions within the methodology?

D. What does a methodological differentiation look like on three horizontal and ten vertical levels?

E. Can structural differences be found between empirical-interpretive (descriptive), empirical-scientistic (explanatory and prognostic) and practical (normative, pragmatic and technical) methodologies at different levels?

F. Is there a complementarity between empirical-interpretive (descriptive), empirical-scientific (explanatory and prognostic) and practical (normative, pragmatic and technical) methodologies? Or, in other words:

G. Are empirical-interpretative, explanative-prognostical and practical methodologies contrary or complementary to each other?

1.2.3 Value issues within political science and practical methodology

A. What are the main axiological differences or practical disputes about questions of value in political science?

B. What are the possibilities and limits of the practical methodologies represented by scientistic scientists (normative rational choice theory) and phronetic perestroikans (applied phronesis)?

C. Can a genuinely practical (normative, pragmatic and technical) methodology include applied methodology (normative rational choice approach) and problem-oriented methodology (applied phronesis)?

D. Can a genuinely practical (normative, pragmatic and technical) methodology establish the foundations for practical political science as part of a "practical social science" (Weber 2011[1904]: 56)?

1.3 Outline of monograph´s goals

The following goals are pursued in this monograph:

1.3.1 „Methodenstreit" or methodological war within political science: First, the "Methodenstreit" is presented. The discussion focuses on the protagonists in the methodological war and the associated Kuhn narrative and its terminology. The deficits, misunderstandings and issues that arise are demonstrated with the help of an *ad fontes* reconstruction based on original sources. Furthermore, a more appropriate terminology is presented, with the help of which one can better reconstruct the development of political methodology.

1.3.2 Overcoming the methodological war: Secondly, it is shown that due to the complexity of the topic, it is necessary and sensible to explain the crucial questions (axiological, epistemic, methodological or ontological) on ten vertical and three horizontal levels. Only through an increase in complexity can the counter-productive dispute transform into a constructive discussion of the limits and possibilities of political methodology. Firstly, the structural differences between empirical-interpretive (descriptive), empirical-scientific (explanatory and prognostic) and practical (normative, pragmatic and technical) methodologies are demonstrated. Then it is shown that they are complementary. Due to this complementarity, mutual recognition instead of religious war, and thus a constructive discussion, is possible.

1.3.3 Value issues within political science and practical methodology: Third, I will build on the state of methodological knowledge within political science with my own methodological considerations (Lauer 2013 and 1997). Above all, I will point out the methodological deficits of the current practical methodology, that of normative rational choice theory and applied phronesis. Then I will explain the need for a genuinely practical (normative, pragmatic and technical) methodology, since this differs in principle from an empirical (descriptive, explanatory and prognostic) methodology on ten methodological levels. Such a practical methodology can form the foundations of practical political science as part of a "practical social science" (Weber 2011[1904]: 56). Furthermore, important axiological questions such as the influence of value questions on scientific results or the relationship between politics and science will be discussed.

1.3.1 "Methodenstreit": terminology, deficits, counterparties, misunderstandings and issues in the methodological war, the scientistic and the phronetic Kuhn narrative

At the center of the work lies the philosophical (axiological, epistemological, methodological and ontological) science war or „Methodenstreit" within political science that erupted at the start of the 21st century between the scientistic establishment and the phronetic perestroikans. The emphasis on methodology does not justify excluding axiological, epistemic and ontological questions; on the contrary, without discussing these questions one cannot adequately discuss the science war because such questions decisively influence the methodological approach.

This methodological war has been smoldering since the 19th century, causing opponents to talk past each other rather than to each other. The other side's positions are simply ignored (scientistic scientists), or the constant methodological

developments of the other party are not adequately perceived (interpretivists). The latter create straw men that they then easily knock down.

The notion of *ad fontes* reconstruction was established in the 16th century by Desiderius Erasmus of Rotterdam (1466-1536), Philipp Melanchthon (1497-1560) and Martin Luther (1483-1546) as a humanistic tradition. It seeks to legitimize scientific narratives with the help of original sources. This established tradition in the humanities and in cultural studies is paradoxically ignored by scientists who prefer linguistic-interpretive methods. The aim of this monograph is to reconstruct the positions of the scientistic scientists on the basis of scientific handbooks and their classics.

Both sides in the methodological war refer to the philosophy of science of Thomas Samuel Kuhn (1962), so that I speak of two versions of the Kuhn narrative: a scientistic and a phronetic version. However, the Kuhn narrative cannot adequately explain the preceding methodological development. This narrative is counterproductive, because it acts like a fire accelerator and contributes decisively to the many misunderstandings in the dispute. It will be shown that the concepts of Georg Henrik von Wright (1971) and Imre Lakatos (1978) are better suited to represent the development of scientific methodology since the emergence of science.

1.3.2 Overcoming the „Methodenstreit": axiological, epistemological, methodological and ontological aspects of the methodological war on ten vertical and three horizontal levels

A. Participatory philosophy of science

"Philosophy is like a lame man who cannot move without his crutches, the sciences. And the sciences are like workers in the dark if they do not use the light of philosophy to see the ways that connect them with life"[8] (Lorenzen 1974: 130, my translation). Although Lorenzen exaggerates the importance of the philosophical usually formal analyses are greatly underestimated, while contributions by philosophers are generally overestimated. This also applies analogously within the sciences.

Firstly, Lorenzen overestimates the possibilities of philosophy; secondly, he usually pursues a philosophy of science in philosophy-of mode rather than in philosophy-with mode. "In this mode [philosophy-of mode], philosophers remain largely outside of the individual sciences with their work. To this Hansson contrasts 'philosophy with ...', meaning a mode of philosophizing in close collaboration with scientists from a particular science. In this mode, philosophers of science do not operate as outsiders, as observers of the individual sciences, but are themselves active participants in the theory development process of the individual sciences. In this perspective, the goal of the philosophy of science is not only to understand what science is and, if possible, methodologically to improve the science operation. Rather, a contribution to the individual scientific questions should also be provided"[9] (Reydon/Hoyningen-Huene

[8] "Die *Philosophie ist wie ein Lahmer, der ohne seine Stützen, die *Wissenschaften, nichts bewegen kann. Und die *Wissenschaften sind wie Arbeiter im Dunkeln, wenn sie nicht das Licht der *Philosophie benutzen, um die Wege zu sehen, die sie mit dem Leben verbinden" (Lorenzen 1974: 130).

[9] "In diesem Modus [Philosophie-von-Modus] bleiben Philosophen mit ihrer Arbeit weitgehend außerhalb der Einzelwissenschaften. Dem stellt Hansson die ‚Philosophie mit …' gegenüber, womit er einen Modus des Philosophierens in enger Zusammenarbeit mit Fachwissenschaftlern aus einer Einzelwissenschaft meint. In diesem Modus betreiben Wissenschaftsphilosophen ihr Fach nicht als Außenstehende, als Beobachter der

2011: 136, my translation; see Hansson 2008: 472-483). These considerations are described by Thomas A. C. Reydon and Paul Hoyningen-Huene under the subheading "Participatory Philosophy of Science".

The second position, philosophy-with mode, is summed up as follows: "Other authors have a more ambitious goal: in their opinion, the philosophy of science should also seek to produce scientific knowledge. Here, the philosophy of science becomes an interdisciplinary enterprise and the philosopher of science a researcher who participates in the knowledge production process of the individual sciences and continues this process in areas where the individual sciences themselves do not occur"[10] (Reydon/Hoyningen-Huene 2011: 136, my translation; see also 140-141).

Mario Bunge is also committed to a close collaboration between philosophy and individual science: "Now a philosophy of *x* [x stands for any single science] should match *x* rather than be at variance with *x*, for only then will it be able to (*a*) give an adequate (true) description of *x*, (*b*) suggest fruitful avenues for the conduct of inquiry in *x*, and (*c*) participate competently and effectively in philosophical controversies in or about *x*. We call these the *conditions of adequacy and fertility* (...). But what does 'match' mean in this context? Loosely speaking, a philosophy P*x* of *x* matches *x* if P*x* shares the 'spirit' or 'attitude' of *x*, deals with philosophical issues raised by the actual practice of *x*, and makes use of scientific findings to construct and check its own hypotheses" (Bunge 1996: 10).

Logical positivism and Erlanger constructivism can be seen as philosophical schools working in the philosophy-of mode. The overwhelming majority of twentieth-century philosophers of science, on the other hand, have always explained their considerations using the example of a single science, with physics predominating (Popper 2005 [1934], Kuhn 1976 [1962], Feyerabend 1986 [1975], Lakatos 1978). In the second half of the 20th century, there was a turn to biology (Salmon 1989, Vollmer 2002 [1975]), to medicine (Wieland 1986), in some cases to the social sciences (Topitsch 1967, Adorno 1976 [1969], Acham 1983, Bodammer 1987, Salmon 1992, Braun/Saam 2015) and the technical sciences (Bunge 1996, Poser 2008a, Kornwachs 2012). In the following, I will briefly describe how I understand, have pursued and continue to operate a participatory methodology of science based on the example of political science.

B. Participatory scientific methodology using the example of political science

My criticism is directed at the mainstream of the sciences, especially political science, meaning both the scientists and the interpretivists. A practical (normative, pragmatic and technical) discourse that satisfies current logical-analytic reasoning is not possible with either the scientistic or the interpretive methodology, because it requires a practical (normative, pragmatic and technical) and not a reductionist methodology.

Einzelwissenschaften, sondern sind selbst aktive Teilnehmer im Theorieentwicklungsprozess der Einzelwissenschaften. In dieser Perspektive ist das Ziel der Wissenschaftsphilosophie nicht nur zu verstehen, was Wissenschaft ist und nach Möglichkeit den Wissenschaftsbetrieb methodologisch zu verbessern. Vielmehr soll auch ein inhaltlicher Beitrag zu den einzelwissenschaftlichen Fragestellungen geliefert werden" (Reydon/Hoyningen-Huene 2011: 136; see Hansson 2008: 472-483).

10 "Andere Autoren haben ein ambitionierteres Ziel: Ihrer Meinung nach sollte die Wissenschaftsphilosophie ebenfalls anstreben, wissenschaftliches Wissen zu produzieren. Die Wissenschaftsphilosophie wird hier zu einem interdisziplinären Unternehmen und der Wissenschaftsphilosoph zu einem Forscher, der selbst am Wissensproduktionsprozess der Einzelwissenschaften teilnimmt und diesen Prozess in den Bereichen weiter fortsetzt, wo die Einzelwissenschaften selbst nicht auftreten" (Reydon/Hoyningen-Huene 2011: 136; see also 140-141).

In particular, using the example of the European Union and social security, I have explained, explicated, clarified, reconstructed, newly developed or further developed scientific tools (concepts and methodological approaches) in accordance with my motto, "combining tradition and progress". Thus, I practice scientific theory as a participatory methodology of science based on concrete questions within political science (Lauer 1993 and 1998).

In my opinion, methodological questions can only be adequately addressed within a participatory scientific methodology. This first requires dealing with philosophical questions (Lauer 2013). Secondly, it examines the concrete axiological, conceptual, epistemological, methodological and ontological considerations within a discipline. I do so using the example of political science (Lauer 1997). Third, applying concrete methodology to concrete, paradigmatic examples, I have elaborated this most extensively on the example of social security (Lauer 1998).

C. The need to treat axiological, epistemic, methodological and ontological questions ideally on ten vertical and three horizontal levels

"Attempts are made to differentiate the levels of abstraction more strongly than is the case in most American representations, where arguments from the meta-theoretical, theoretical, methodological and research-technical levels are often juxtaposed. It should not be concealed that this attempt occasionally has something artificial about it"[11] (von Beyme 2000 [1972]: 7, my translation). Following the approach of Klaus Gustav Heinrich von Beyme, the aim here is to separate the different methodological levels of scientific discourse. I wish to show the complexity and diversity of scientific discourses and their methodology, in particular by identifying the implicit assumptions and prerequisites, which are found mainly in the choice of scientific tools as well as in the presupposed philosophical (axiological, epistemological, methodological and ontological) foundations.

The distinction between different levels of scientific theory certainly has something artificial about it and can only be idealized. Nevertheless, it is made because it is not only of didactic interest, but is central to both scientific analysis and the evaluation of scientific results. The distinction between ten vertical and three horizontal levels forms, as it were, the intellectual overview, an orientation or a topography of scientific methodology (logical geography, Ryle 2009 [1949]; orientation in the thinking or topography of reason, Kant 1977 [1786]). The ten vertical levels also form the outline, following which almost all subsequent chapters and charts are constructed. In this work, all ten levels of scientific discourse are systematically represented (Chart 1, p. 21).

A horizontal structure is further added to this vertical structure. In the first place, there are structural differences between empirical-interpretive (descriptive), empirical-explanatory and empirical-prognostic and practical methodologies, and secondly, these methodologies complement each other (Chart 2, p. 22).

[11] "Es wird versucht, die *Abstraktionsebenen* stärker zu sondern, als dies in den meisten amerikanischen Darstellungen der Fall ist, bei denen Argumente der meta-theoretischen, theoretischen, methodologischen und forschungstechnischen Ebene häufig unvermittelt nebeneinander stehen. Es sei nicht verschwiegen, daß dieser Versuch gelegentlich auch etwas Künstliches an sich hat" (von Beyme 2000 [1972]: 7).

This monograph seeks to identify three distinct methodological traditions between which methodological incommensurability can be identified, that is, each methodology has different axiological, epistemic, methodological and ontological presuppositions or assumptions. On the one hand, a fundamental difference between an empirical (descriptive, explanatory and prognostic) methodology (Chart 6, p. 26) and a practical (normative, pragmatic and technical) methodology (Chart 7, p. 27) should be pointed out. Within empirical methodology, there are differences in principle between an interpretative (empirical-descriptive) (Chart 3, p. 23) and a scientistic (empirical-explanatory and empirical-prognostic) methodology (Chart 4, p. 24). All three methodologies can be found in the second chart, p. 22).

It does not make sense to speak of different paradigms within political science, because they do not involve general incommensurability. The methodological incommensurability does not lead to irreconcilable discontinuities that prevent meaningful coexistence. But this is exactly what should be the case when one speaks of different paradigms, as the Kuhn narrative urges. On the contrary, a practical methodology is necessarily dependent on the results generated by an empirical (descriptive, explanatory and prognostic) methodology. To generate political knowledge, therefore, one needs all three methodologies: first, the empirical-descriptive methodology to describe visible political phenomena, then the empirical-explanatory and prognostic methodology to explain the invisible causal relation of these phenomena and make predictions about the future. Only with a genuinely practical (normative, pragmatic and technical) methodology can political standardization and regulations be justified. A practical political science that seeks to justify realistic regulatory proposals and not alien dystopias or utopias is dependent on the knowledge that has been developed with the help of empirical-descriptive and empirical-explanatory methodologies (Chart 9, p. 29).

1.3.3 Value issues within political science and practical methodology

The possibilities and limitations of practical methodologies are a particular focus of my scientific interests. The search for scientific answers to practical political questions forms the core of my work. I acknowledge empirical (descriptive, explanatory and prognostic) answers, but my claim is to formulate practical (normative, pragmatic, technical) answers with practical tools (concepts, sentences, theories, logics, arguments, methods and methodological approaches). It is necessary to use existing scientific tools, to develop some of them further and to discover and justify new ones.

The possibilities and limits of two practical methodologies should therefore be presented and critically evaluated. Both the practical methodology of the scientistic scientists (normative rational choice theory) and of the phronetic perestroikans (applied phronesis) will be evaluated. Unfortunately, little attention has been paid to practical methodology within the linguistic-interpretive methodology, although a practical, problem-driven research (problem-based research) is vigorously demanded (Green/Shapiro 1994, Shapiro 2005, Schram 2003 and 2005). The phronetic perestroikans, as one of several interpretive schools, not only demand problem-driven research, but have also used applied phronesis to formulate a methodological approach for how to concretely implement this kind of research.

The aim of modern science is to enrich human life (Bacon 1990 [1620]: 173, 81. aphorism, part 1). Scientistic scientists believe that one can make "inversions of causal statements" (Weber 1973d [1917]: 529 [491]) or "mere inversions of the basic schema of scientific explanation" (Popper 1981 [1972]: 353). Both are only possible because there is an equivalence between causality and action (Bacon 1990 [1620], 3rd aphorism). Only under this assumption can recognition (theory) be converted into action (practice), i.e. into social technology. Practical problems can therefore be solved through the inversion of causal statements, because true knowledge and effective action are equivalent (Bacon 1990 [1620]: 286, 4th aphorism, part 2). The scientistic establishment not only believes that normative rational choice theory offers an adequate practical methodology, but also that it is the best practical-normative methodology (Hardin 2011 [2009]).

The phronetic perestroikans question the problem orientation of the scientistic scientists and want to use an applied phronesis to revolutionize political science and to help it regain more public relevance: the titles of their works – "Making Social Science Matter: Why Social Inquiry Fails and How It Can Succeed Again" (Flyvbjerg 2001), "Making Political Science Matter" (Schram/Caterino 2006), and "Real Social Science. Applied Phronesis" (Flyvbjerg/Landman/Schram 2012a) – indicate the program.

Weber distinguishes between empirical and practical social science. He notes the distinction between theoretical and practical philosophy that has existed since antiquity only indirectly, in a footnote in which he emphatically emphasizes the work of the logicians of neo-Kantianism (Weber 2011 [1904]: 50). In his methodological writings, Weber's main concern is the possibilities and limitations of an empirical science. The limits he worked out for empirical sciences are generally still accepted by the empirical-oriented scientistic scientists today.

On the other hand, the perestroikans, as well as most interpretivists, reject a separation between is and ought (*Sein* and *Sollen*). Furthermore, they claim that the axiological values of the researchers and the explorers almost necessarily influence research as guiding interests (Habermas 1968c).

Further important goals of this work concerning value questions include, firstly, a detailed presentation of the axiological arguments and their influence on scientific results. Secondly, the critique of the philosophers of technology (Bunge 1967b, Kornwachs 2008 and 2012, Poser 2001) is explained. An *inversion* of causal statements that Maximilian Carl Emil Weber and Karl Raimund Popper is still considered unproblematic. Third, the need for a practical (normative, pragmatic, and technical) methodology that differs at ten levels from an empirical (descriptive, explanatory and prognostic) methodology is explained.

The end goal is to justify the possibility and necessity of a practical political science, and also of a practical social science, which builds on the scientific-theoretical distinction pointed out by Weber. This practical methodology establishes a practical political science that is also in the Aristotelian tradition, but has little in common with the practical political science of Wilhelm Hennis (1963). Neither the normative rational choice approach of the scientists, nor the applied phronesis of the perestroikans, nor the topics favored by Hennis are rejected, but they form only very small parts of a much broader practical (normative, pragmatic and technical) methodology.

There are several models for how to shape the relationship between practical politics and political science. Not a few scientistic scientists lean towards a technocratic model in which science has the last word. The lack of democratic legitimacy in this approach is immediately striking. On the other hand, while the decisionist model has democratic legitimacy, it is lacking in factual expertise.

Jürgen Habermas (1968b [1963]) proposed a pragmatic model that combines the advantages of the technocratic and the decision-making model and overcomes the disadvantages of both. In many handbooks on political consulting (Falk/Rehfel/Römmele/Thunert 2006, Heidelberg Academy of Sciences 2006, Bröchler/Schützeichel 2008), this model is not only discussed, but preferred by most scientists as well as by the phronetic perestroikans. It is also used in practical politics; the EU Commission for example also resorts to the pragmatic model and argues for a democratization of expertise (democratising expertise) and a scientification of democracy (expertising democracy) (EU Commission 2001a, EU Commission 2001b, EU Commission 2002).

Due to the fact that practical politics and science have different functional logics, i.e. have different tasks and have to comply with different requirements and criteria, the pragmatic model of political consulting in the end can meet neither democratic nor scientific standards. For reasons of principle, science can only justify hypothetical knowledge (Chart 9, p. 29), but neither make definite or binding decisions nor assume liability for their consequences. Democratic institutions can do just that: make binding and definitive decisions, and at the same time be liable for the consequences, i.e. assume legal responsibility. Therefore, I advocate a complementary model of political consulting in which each subsystem performs its tasks as well as possible (Chart 12, p. 31, Chart 11, p. 31).

1.4 Structure of the work

The introduction provides a general lead-in to the topic as well as an overview of the most important questions. The *second* and *third* chapters present the actual „Methodenstreit" between scientistic scientists and perestroikans within political science at the beginning of the 21st century.

The axiological, epistemological, methodological and ontological arguments in political science are characterized not only by the complexity of the topics they contain, but also by confusion, mutual criticism and misunderstandings of all kinds, just as those in the positivism dispute (Adorno et al., 1976). To avoid confusion and misunderstandings, the „Methodenstreit" is dealt with in two chapters, at the risk of redundancies and repetitions.

First, the *second* chapter discusses the most important issues that characterize this dispute. This is followed by an explication of terminology, which is necessary for the structuring of the questions and controversies, so that a factual discussion becomes possible. The scientistic scientists (naturalists, causal reductionists, (neo) positivists, disciplined political scientists; 3rd chart, p. 23), who are oriented towards the natural sciences and apply a logical-mathematical research methodology, are introduced first. At the conclusion of the second chapter, the competing methodological tradition, which is oriented towards the humanities and cultural studies and uses a linguistic-interpretive methodology, is considered using the example of the phronetic

perestroikans (Chart 4, p. 24). They represent the latest major rebellion against the scientistic establishment – and not against the mainstream, as is generally claimed. The terms "establishment" and "perestroikans" are also explained here.

The second chapter is primarily about the Kuhn narrative, that is, the storyline of the methodological war. This is antagonistic and can convince dramaturgically and rhetorically, but it not only stands in the way of an adequate scientific debate but has for decades been contributing to a considerable extent to this counterproductive methodological war. In the reduction of complexity, Ockham's razor is used so boldly that of the actual opponents only cardboard figures are left. The economy principle (principle of parsimony), first formulated by Wilhelm of Ockham (1288-1347), in this case calls for the economic use of scientific philosophical assumptions.

The methodological war, known as the „Methodenstreit", can therefore only be ended by first working with other terms. Secondly, if one reduces the other position to a handful of caricatured theses, important assumptions are omitted or distorted. A more nuanced presentation of political methodology, i.e. an *ad fontes* reconstruction from original sources, is inevitable because of its complexity. This is what the next chapter will do.

The *third* chapter is the most important and comprehensive part of this work. It undertakes a differentiation and a nuancing between terms bordering on pedantry. The factual, philosophical (axiological, epistemological, methodological and ontological) differences and some similarities between the scientistic establishment and the phronetic perestroikans, as well as my own statements, are examined in more detail on ten levels (Chart 1, p. 21). In addition to these distinctions made on the vertical plane, above all for epistemic reasons, three distinctions are made on the horizontal level for axiological and ontological reasons (Chart 2, p. 52). Only with such differentiations can one reasonably do justice to the complexity of these issues, as explained elsewhere (Lauer 2013 and 1997). Only a few answers to these questions can be discussed. The aim is to provide an overview of the manifold relationships between axiological, epistemological, methodological and ontological questions or a logical geography of political methodology (Chart 2, p. 22).

The *fourth chapter* presents a summary of the results and the main theses. The introduction started with some reflections on the importance of the methodology, and the summary asks whether the „Methodenstreit" is an expression of an identity crisis or a sign of relevance and vitality.

The *fifth* chapter contains an outline of political methodology. The outlook is intended to provide a brief overview of political science methodology in general and, in particular, an overview of the methodology of practical political science. Here, ways to overcome the deficits of political methodology in general as well as of practical methodology in particular are identified (Chart 10, p. 30). A practical political science as supplementing an empirical (descriptive, explanatory and prognostic) political science (Chart 6, p. 26) with a practical (normative, pragmatic and technical) methodology (Chart 7, p. 27, Cahrt 13, p. 32) is, in my opinion, the appropriate place to discuss practical political issues. A practical methodology can justify a practical social science (Weber 1973c [1904]) and thus also a practical political science (Chart 8, p. 28, Chart 9, p. 29).

1.5 Literature, self-citation and citation

The citations in this essay and in the references have several special features:

- The citation first indicates the year of the edition used and the original year of publication in square brackets. For classic works, the original year of publication (not the year of publication of the first German translation) is always stated in square brackets after the year of publication of the edition used.
- The page number refers to information on the used edition. Exceptions to this are due to edition conditions. In classics such as Aristotle, Plato, Immanuel Kant or Maximilian Carl Emil Weber, the page numbers of basic editions are also recorded in square brackets. A special citation is also appropriate for the works of Ludwig Josef Johann Wittgenstein. In the Philosophical Investigations, the paragraph is indicated instead of the page number, while in the Tractatus logico-philosophicus only the number of the sentence is shown.
- The indication of the edition is omitted in the text, whereas it is indicated in the bibliography. For online articles, the URL as well as the last date of access of the website are listed.
- As a rule, the first names of all authors are mentioned, provided they could be determined.

I have also been publishing scientific papers on the Internet for years, and a number of projects are constantly being developed as "works in progress". I use extensive material from these projects. These projects are referenced as follows:

- Internet project ongoing since 1997: Scientific Political Consulting. Part II: Methodology of Practical Political Science. URL: praktische-politikwissenschaft.de. Referenced in the text as "Lauer 1997".
- Internet project ongoing since 1998: The potentials of the German social model. Proposals for a consistent and complementary development. URL: soziale-sicherheit.de. Referenced in the text as "Lauer 1998".
- Internet project ongoing since 2013: Scientific Political Consulting. Part I: Methodology of empirical and practical science. URL: praktische-wissenschaften.de. Referenced in the text as "Lauer 2013".

A self-citation is avoided because it would be very reader-unfriendly. The necessary URL information would make the text illegible, as the projects that are being developed are published in HTML format and not in PDF format. These projects have not yet been published in print.

1.6 Transient versus linear text

Linear text has a fixed structure in which the reader moves from the beginning to the end of the text (from left to right and from top to bottom). If the text is in digital form, the contents are in a file. The text is linear in all print forms. Hypertext or transient text has no rigid structure and is usually not contained in just one file but is spread across several files. The reader has the opportunity to jump from one place in the text to another via links or references and to return to the original position. Hypertext refers to connections between documents that have the purpose of explaining terms and pointing to other documents. Image and graphics, audio and video can also be integrated.

Although possibilities for fast navigation within the text have also been developed for books (e.g. tables of contents, person and subject registers), hypertext makes this much easier. This not only makes reading easier for the reader, but also facilitates the evaluation and thus the understanding of complex relations and contexts. An HTML version of this monograph can be found on the Internet at the following URL: www.lauer.biz/methodenstreit/index-en.html

1.4 Charts

Chart 1: The Ten Levels of Scientific Methodology

<table>
<tr><td rowspan="5">1.1 Philosophical foundations:

Tasks and limits, axiological, epistemic, methodological and ontological assumptions, conditions or criteria as well as ideals and properties of scientific research</td><td>1.1.1 Philosophical level (1, first level)</td><td colspan="2">A. Tasks and objectives of scientific research
B. Limits of scientific research
C. Axiological, epistemic, methodological and ontological assumptions of (political) scientific research</td></tr>
<tr><td>1.1.2 Knowledge level (2):
general conditions or general (core) criteria of knowledge</td><td colspan="2">General postulates of rationality:
A. Intersubjectivity
B. Objectivity
C. Reliability
D. Validity</td></tr>
<tr><td rowspan="3">1.1.3 Level of ideals and properties (3)
of scientific research</td><td>Ideals</td><td>Properties</td></tr>
<tr><td>A. Truth
B. Rightness (Ethics)
C. Justice (Politics)
D. Phronesis
E. Efficacy</td><td>A. True/False
B. Right/Wrong
C. Just/Unjust
D. Wise/Unwise
E. Effective/Ineffective</td></tr>
<tr><td></td></tr>
<tr><td rowspan="7">1.2 Scientific tools</td><td>1.2.1 Concept level (4)</td><td colspan="2">Scientific concepts</td></tr>
<tr><td>1.2.2 Sentence level (5)</td><td colspan="2">Scientific sentence (statements, norms, i.e. justice standards, pragmatic or technical rules)</td></tr>
<tr><td>1.2.3 Theory level (6)</td><td colspan="2">Scientific theories</td></tr>
<tr><td>1.2.4 Logic level (7)</td><td colspan="2">Formal inference and inference rules related to scientific concepts and scientific sentences</td></tr>
<tr><td>1.2.5 Argumentation level (8)</td><td colspan="2">Argumentation inside scientific theories or logical structure of scientific arguments (logic of research)</td></tr>
<tr><td>1.2.6 Method level (9)</td><td colspan="2">Scientific investigation of facts and judgements, generation and evaluation of facts</td></tr>
<tr><td>1.2.7 Methodical approaches level (10)</td><td colspan="2">Scientific generation of theories</td></tr>
</table>

Chart 2: Three Traditions and Ten Levels of Political Science Methodology

Scientific methodologies and **types of science**	**I. Descriptive tradition**: empirical-descriptive methodology (sciences)	**II. Explanatory-prognostic Tradition**: empirical-explanative and empirical-prognostic methodology (sciences)	**III. Practical tradition**: practical (normative, pragmatic and technical) methodology (sciences)
1. Philosophical level	**Descriptions**: description of (**visible**) **phenomena**, interpretation of **symbols** (text, image, audio and video), mainly by means of language	**Explanations** and **predictions**: world recognition, world explanation of **invisible causalities** using especially logic and mathematics	**Valuations**: world change, practical (normative, pragmatic and technical) standards (norms) and regulations using logic, language and mathematics
2. Knowledge level	Empirical-descriptive knowledge	Empirical-explanatory and empirical-predictive knowledge	Practical (normative, pragmatic and technical) knowledge
3. Level of ideals and properties	Ideal of *truth* Predicates: true or false		Ideal of *rightness* (ethics): right/wrong Ideal of *justice* (politics): just/unjust Ideal of *phronesis* (Klugheit): wise/unwise Ideal of *efficacy*: effective/ineffective
4. Concept level	Qualitative, interpretative or classificatory concepts	Quantitative, mathematical or metric concepts	Practical (normative, pragmatic and technical) concepts
5. Sentence level	Descriptive propositions	Explanatory and predictive propositions	Norms, i.e. justice standards, pragmatic and technical rules
6. Theory level	Empirical theories consist of systems of propositions, including propositions about standards and rules.		Practical theories consist of regulations, i.e. systems of empirical statements and practical standards and regulations.
7. Logic level Formal inference and inference rules related to scientific concepts and scientific sentences	**Truth-apt logic**: *Propositional logic*: It is the case, that [...] *Predicate* logic: F "is a human". Modal logic, e.g. *alethic modal* logic: It is necessary/impossible/possible/contingent that [...] *Epistemic* (doxastic) logic: It is believed/considered impossible/conceivable that [...] *Tense* logic: It was/will be/always will be/always was the case that [...] *Deontic* logic (*is-ought*, Sein-Sollen): It ought to be/it is forbidden/permitted/indifferent that [...]		Unlike classical logic, these are **not truth-apt** (*Jørgensen's dilemma*). Logic of *Norms* (*act-ought*, Tun-Sollen, not *is-ought*, Sein-Sollen), logic of *imperatives*, *interrogative* logic, legal *logic*, logic of *implementation* (Durchführungslogik). Efficacy and rightness, Prima-facie property of ethical norms and political maxims of action. Conflicts of justice standards and mediation of justice standards.
8. Argumentation level Argumentation inside scientific theories or logical structure of scientific arguments (logic of research)	Analytical, dialectical, empirical, evolutionary or hermeneutic means of argumentation		Practical (normative, pragmatic and technical) argumentation
	Explaining-understanding-debate thought of as complementary		Practical, substantive argumentation, practical syllogism and pragmatic syllogism
	Understanding	Explaining	
	Abductive, inductive, substantial, warrant-using, tentative, formally invalid, epagogical argumentation: Hegelian dialectics, hermeneutic circle	Deductive, analytical, warrant-establishing, conclusive, formally valid argumentation: deductive-nomological model (or HO schema), evolutionary explanatory model	
	Aristotelian topic (dialectics)		
9. Methods level with reference to political science. Scientific investigation of facts and judgements, generation and evaluation of facts	Empirical-descriptive methods	Empirical-explanatory and empirical-predictive methods	practical (normative, pragmatic and technical) methods
	Qualitative methods: content analysis, document analysis, participatory observation	Quantitative methods: quantitative data collection, correlation and regression analyses	Arguing, discourse, deliberation, mediation, synopsis, categorical imperative, evaluation, implementation planning, technology assessment (TA)
	Triangulation: The application quantitative and qualitative methods on a phenomenon.		
10. Methodical approaches level with reference to political science Generation and evaluation of theories	Approaches with empirical and practical elements		
	Socio-technological, synoptic, practical-normative, critical-dialectical, empirical-normative, argumentative and pragmatic approach, rational choice approach, advocacy coalition approach, governance approaches, actor-centered approaches (decision arenas, networks, exchange and negotiation systems, regimes)		
	Empirical approaches		Practical approaches
	Historical, institutional and structuralist approach, narratives, frames, discourses	Behavioural, functional and quantitative approach	Participatory policy approach, decisionist, synoptic, normative, pragmatic and technical approach

Chart 3. The liberal-scientistic Narrative: axiological, epistemic, methodological and ontological Assumptions of the platonic-galilean Tradition

Ontological assumptions	1. External reality both given and constructed 2. Causal reductionism or causality as an invisible relation that which holds the world together at its core 3. Empirical reductionism 4. Equivalence between causality and action 5. Inversion of causalities: The transformation of empirical causal propositions produce social-technological rules or normative statements.
Epistemic objectives	6. Causal regularities and generalisations at the macro level 7. but also causal processes or causal mechanisms at the micro level 8. Postulates of rationality: intersubjectivity, objectivity, reliability, validity 9. Ideal of truth, coherence theory or correspondence theory of truth 10. If-then depth structure and hypothetical character of knowledge. *Conjectures*, therefore, neither a search for universal truths nor context knowlege! The context is stored in the *ceteris paribus* conditions or is implicitly assumed. 11. Methodological individualism
Methodological procedures	12. Logic and mathematics as the preferred means of world recognition and world change 13. logical-mathematical concepts, *data-set observations* (DSOs) and *causal-process observations* (CPOs) 14. Truth-apt empirical and normative statements 15. Falsifiable causal hypotheses 16. Deductive and inductive argumentation 17. Model thinking 18. Experiments (simulations) 19. Quantitative methods (e.g. correlation and regression analyses) 20. Qualitative-mathematical methods e.g. process analysis (*process tracing*), *Qualitative Comparative Analysis* (QCA)
Axiological, practical (normative, pragmatic and technical) assumptions	21. Liberalism 22. Utilitarianism 23. Universalism 24. Separation between Is and Ought 25. Normative rational choice theory as a practical approach

Chart 4: The phronetic Narrative of the Perestroikans: axiological, epistemic, methodological and ontological Assumptions

Ontological assumptions	1. Constructed reality 2. Detecting tension points
Epistemic objectives	3. Contextuality of knowledge 4. Description of phenomena 5. Use of symbols (texts, pictures, audio and video), *naming* 6. Local knowledge 7. Language rules, interpretation schemes, forms of life (Lebensformen) 8. Framing, structures and patterns of interpretation
Methodological procedures	9. Qualitatively-interpretative tools (concepts, methods and methodical approaches, e.g. qualitative content analysis, discourse analysis, hermeneutics) 10. Quantitative tools; the quantitative-qualitative schism is rejected and a diversity of methods propagated 11. Methodological holism
Axiological, practical (normative, pragmatic and technical) assumptions	12. Better practical relevance, problems with practical relevance (problem-driveness) 13. Pragmatism 14. Hermeneutics 15. Phenomenology 16. Philosophy of language 17. Critical theory 18. Structuralism 19. Applied phronesis
Assumptions that do not produce fundamental contradictions to the scientistic narrativ	20. No universal truths 21. Contextuality of knowledge 22. External reality constructed or given 23. Coherence theory of truth instead of correspon-dence theory of truth

Chart 5: Actor-centered Explanations, the Rational Choice Approach

<table>
<tr><td>Macro or
system level</td><td>1. (a) Collective
characteristic</td><td colspan="2">(b) Collective hypothesis,
causal regularity, nomological explanations:
"nomological conception of scientific
explanation", "explanation2"
(Salmon 1989: 184).
→</td><td>4. (c) Aggregate
characteristic</td></tr>
<tr><td>Transition from
macro to
micro level,
explanation at the
micro level and
transition from the
micro to the macro
level</td><td>↘
A. Context hypothesis</td><td colspan="2">B. Individual hypothesis,
causal process, ontic explanations: "ontic
conception of scientific explanation".
"causal/mechanistic explanation"
"explanation1"
(Salmon 1989: 182 and 184).
→</td><td>↗
C. Aggregation rules</td></tr>
<tr><td>Micro or
individual level</td><td></td><td>2. Individual
characteristic (actor)</td><td>3. Individual
characteristic
(action)</td><td></td></tr>
<tr><td></td><td>Logic of situation
The assumptions made
here model the
relationship between
the situation and the
actor.
Coleman describes
these as rules that
ensure the transition
from macro to micro
level.</td><td colspan="2">Logic of selection
Teleological action theory of the
individual level, here concerning the rules and
preferences on the basis of which the
individuals choose what action to take.</td><td>Logic of aggregation
Transformation rules
based on which
the collective
explanandum is derived.
Coleman designates them
as
rules which ensure
the transition from the
micro to the macro level.</td></tr>
<tr><td colspan="5">Sources: My own presentation based on the sketches of Coleman (2010 [1990]: 10 and 13), and the 1st chapter (Coleman 1990), von Beyme (2000 [1972]: 136-150), Braun (1999: 17-52) and Salmon (1989).</td></tr>
</table>

Chart 6: Methodology of empirical Political Science

Type of science	Human and cultural sciences (*humanities*), interpretivists		*Real social/political science*, phronetic perestroikans	*Social sciences*, scientistic scientists
Forms of knowledge	Empirical (empirical-descriptive) knowledge.		Empirical knowledge	Empirical (explanatory and predictive) knowledge
Tasks and objectives	World understanding, world interpretation, world description			World explanation
	Interpretation and interaction: describe or critique lifeworlds and text analyses.	Describe visible phenomena (*phainómenon*: visible appearance).	Discover tension points	Recognize invisible causalities between events, explain causal regularities and causal processes.
Knowledge objectives	Descriptive, exploratory, critical			Explanatory, predictive
Tools in a large sense (*Organon*)	**Language** as a preferred means of world recognition, world interpretation and world description of (visible) phenomena, especially interpretative and qualitative-classificatory tools (concepts, methods and methodical approaches), e.g. qualitative content analysis, discourse analysis, hermeneutics.			**Logic and mathematics** as preferred means of world recognition and world explanation of invisible causalities, especially quantitative and qualitative mathematical tools, experiments and simulations.
Macro level	Language rules, interpretation schemes, forms of life, framing, structures and patterns of interpretation.	Description of phenomena at the macro level, e.g. demonstrations.	Show power structures.	Nomological explanations: probabilistic laws or regularities, complex interrelationships, causal or nomological regularities, (*explanation2*).
Micro level	Use of symbols (texts, pictures, audio and video), *naming*.	Description of phenomena at the micro level, e.g. demonstrator.	Discover tension points	Ontic explanations: Explain cause and effect mechanisms, causal processes or potentialities (*explanation1*).

Chart 7: Methodology of practical political science

Type of science	*Social science*, scientistic scientists	*Real social science*, phronetic perestroikans	Practical political science
Forms of knowledge	Applied knowledge.	Problem-oriented knowledge (*problem-based, problem-driven*)	Practical (normative, pragmatic and technical) knowledge
Tasks and objectives	World change, applied science	World change, problem-oriented science (*problem-based, problem-driven*).	World change, using genuinely practical methodology.
Knowledge objectives	Social-technological	Participatory, critical, deliberative	Practical (normative, pragmatic and technical)
Praxis	Establish social technology by reversing causalities.	Change power relationships and tension points.	Legitimation of normative standardization and regulations.
Normative level, value discourse	Legitimisation of values is not possible: utilitarianism, like ethics of responsibility, is an "ethics of the second order" (Wieland 1999a).	No normative legitimation: "Our sociality and history is the only foundation we have, the only solid ground under our feet". (Flyvbjerg/Landman/Schram 2012c: 293).	Legitimation of maxims of action or political standards (*Handlungsmaximen oder politische Normen*).
Pragmatic level, pragmatic discourse	Selection and substantiation of objectives using a rational choice approach is not possible: Arrowparadox.	No pragmatic legitimation: "[W]here 'better' is defined by the values of phronetic researchers and their reference groups" (Flyvbjerg/Landman/Schram 2012c: 290).	Legitimation of strategies for action, individual-pragmatic rules and sociopragmatic regulations (*Handlungsstrategien, individualpragmatische Regeln sowie sozialpragmatische Regulierungen*).
Technical level, means discourse	Substantiate social-technological regulations with rational choice approach.	Applied phronesis enables empowerment	Substantiate instruments for action or practical instructions for action (*Handlungsinstrumente oder praktische Handlungsanweisungen*).

Chart 8: Practical methodology within political philosophy and political science

Levels of discourse	**Ethics and political philosophy**	**Political science: Policy analysis and governance research**		
		Actor-centered institutionalism and governance perspective	Advocacy coalition approach	Institutional analysis and development framework
Normative value discourses. Normative legitimations, normative (ethical and moral) **evaluations**, here maxims of action (*Handlungsmaxime n*). **Why** should something be done?	Third evaluation stage: ethical-moral rationality, categorical imperative. 3.1 Virtue ethic (*Tugendmoral*), ethical and moral standards, 3.2 Legal morality (*Rechtsmoral*), (political) justice, legal norms (Höffe 2009[2007]: 26).	"Design perspective" (Haus 2010: 109), "third order governing", "metagovernor", "meta governing", "who or what - ultimately - governs the governors" (Kooiman 2003: 170 ff.).	Highest and most comprehensive level, the "*deep core belief system"* consisting of normative and ontological axioms, "basic ontological and normative beliefs, such as the relative valuation of individual freedom versus social equality" (Sabatier/ Jenkins-Smith 1999: 121, see 133).	Constitutional Rules-in-Use (Ostrom/Cox/Schlager 2014:285). "Constitutional-choice rules affect operational activities and their effects in determining who is eligible and the rules to be used in crafting the set of collective-choice rules that in turn affect the set of operational rules" (Ostrom/Cox/Schlager 2014: 284).
Pragmatic objective discourses. Pragmatic legitimations, **objectives** and **purposes**, here strategies for action (*Handlungsstrategie n*). **What** should be done? State, market and civil society.	Second evaluation stage: Here objectives and purposes are evaluated. Pragmatic rationality, pragmatic imperative. 2.1 Individual pragmatic rules, 2.2 Social-pragmatic regulations (Höffe 2009 [2007]: 24-25).	"Level of structuring the practices of problem solving by 'institution building'" (Haus 2010: 109), "second order governing", "institution building" (Kooiman 2003: 153 ff.). "governance structure" (Mayntz/Sharpf 1995: 16).	Middle level of the "*policy core belief systems"* consisting of policy strategies with which central values are implemented, "normative commitments and causal perceptions across an entire policy domain or subsystem" (Sabatier/ Jenkins-Smith 1999: 121, 133).	"Collective Choice Rules-in-Use" (Ostrom/ Cox/Schlager 2014: 285). "Collective-choice-rules affect operational activities and results through their effects in determining who is eligible and the specific rules to be used in changing operational rules" (Ostrom/ Cox/Schlager 2014: 284).
Technical means discourses. Technical legitimations, **means**, here tools of action (*Handlungsinstrume nte*). **How** should something be done?	At the *first stage*, means and ways are tested for their suitability for optional intentions or objectives. Technical rationality, technical imperatives. 1.1 Technical individual rules, 1.2 Social-technological regulations (Höffe 2009[2007]: 23).	Level of an operative practice of direct problem solving (Haus 2010: 109), "first order governing", "opportunity creation" (Kooiman 2003: 135 f.), "Service structure (industry structure" (Mayntz/Sharpf 1995).	Lowermost level with respect to "*instrumental decisions*" (Sabatier/Jenkins-Smith 1999: 133), "*secondary aspects of a coalition belief system"*, e.g. design of specific institutions" (Sabatier/Jenkins-Smith 1999: 122).	"Operational Rules-in-Use" (Ostrom/Cox/Schlager 2014: 285). "Operational rules directly affect day-to-day decisions made by the participants in any setting" (Ostrom/Cox/Schlager 2014: 284).

Sources: Höffe 2009[2007], Ostrom/Cox/Schlager 2014, Mayntz/Sharpf 1995b, Kooiman 2003, Sabatier/Jenkins-Smith 1999, Jenkins-Smith/Nohrstedt/Weible/Sabatier 2014). Frank Fischer (2003: 193-198) identified **four** rather than three levels: Technical-Analytical Discourse: Programme Verification, Contextual Discourse: Situational Validation, Systemic Discourse: Societal Vindication and Ideological Discourse: Social Choice Comparison of actor-centered institutionalism and governance perspective in Haus (2010: 109).

Chart 9: Scientific operations and scientific discourses with reference to political science

1. Analytical operations of political science **Analytical discourses**		*Analytical discourse*: Analytical discourse includes analytical operations and generates *analytical knowledge*. This especially includes *political concepts* or *categories*, but also *models* for analyzing political reality. These are *conceptual* or *logical truths* in the form of non-empirical, truth-apt statements.
2. Empirical operations of political science or operations concerning *what is*, or what constitutes political reality, comprising of **sentences** (descriptions, explanations and predictions), and **sentences** about valid *standardization* and *regulation* of a *political system* **Empirical discourses**	**2.1 Descriptive operation or descriptions of political reality**	*Descriptive discourse*: In this case, the aim is to *understand* political reality. What exists becomes the focus of attention – using *descriptive-interpretative methods* a picture is created of what everyday politics is like in a political system: Power structures, dependencies and political decision-making processes are considered and examined in more detail. This also includes truth-apt statements regarding maxims for action (guidelines, norms, principles and values). These are identified and described, e.g. the welfare state postulate, e.g. Article 20 of the German Constitution. However, it also includes a detailed description of action strategies and instruments such as social security systems.
	2.2 Explanatory operation or explanations of political reality	*Explanatory discourse*: Political reality also requires *causal explanations*. For example, there are explanations for demographic developments, but also for why social policy has developed in one way and not another.
	2.3 Predictive operation or predictions with respect to future political developments	*Predictive discourse*: The need to *predict* future developments is central: It makes sense to take a look into the future in order to provide decision-makers in the present with important key information.
3. Practical operations of political science or operations concerning *what ought to be*, containing discourses on *standardizations* or *regulations* (maxims of action, strategies of action, instruments for action, instructions for action and practical judgements) **Practical discourses**	**3.1 Normative operation or normative dimension of policy**	*Normative discourse* or *value discourse*: In this case, the political maxims of action (*Handlungsmaximen*) which are decisive for the standardization or regulation of the political system as a whole or of a policy area should be discussed.
	3.2 Pragmatic operation, strategic level or dimension of policy	*Pragmatic discourse* or *objective discourse*: In this case, the political strategies of action (*Handlungsstrategien*) that will be decisive for the regulation of a policy area should be discussed.
	3.3 Technical operation, the operational level or dimension of policy	*Technical discourse* or *means discourse*: In this case, the political instruments for action and individual instructions for action (*Handlungsinstrumente*) that are decisive for the regulation of a policy area should be discussed.

Chart 10: Knowledge (*Wissen*) versus capability (*Können*)

<table>
<tr><td rowspan="4">1. Knowledge, theory

Actors:
Scientists, such as political scientists, generate empirical and/or practical knowledge – natural scientists empirical knowledge, technical scientists practical knowledge.</td><td>Form of knowledge: Analytical knowledge in the form of propositions.</td><td>Conceptual and logical truths in the form of non-empirical, truth-apt statements.</td></tr>
<tr><td rowspan="3">Form of knowledge: Empirical knowledge in the form of natural or social science propositions and propositional systems, including statements about standards and rules.

Type of science:
empirical (theoretical) sciences.

Examples: Natural sciences, empirical social sciences.

Analytical and empirical knowledge is also sentences knowledge, because both are formulated as sentences.</td><td>Descriptive knowledge in the form of truth-apt descriptions.</td></tr>
<tr><td>Explanatory knowledge in the form of truth-apt explanations.</td></tr>
<tr><td>Predictive knowledge in the form of truth-apt predictions.</td></tr>
<tr><td rowspan="3">Form of knowledge: Practical knowledge in the form of practical standardizations and regulations

Type of science:

Practical (normative, pragmatic and technical) sciences.

Examples: medical sciences, technical sciences, practical social (political) sciences.

Practical knowledge consists of three different components:
➢ Why, or the normative component, consisting of ethical-moral evaluations, in this case maxims of action
➢ What for, or the pragmatic component, objectives and purposes, in this case action strategies
➢ how, (the technical component, means, here action instruments).</td><td>Normative knowledge in the form of maxims of action (Handlungsmaximen) and normative-political judgments that are just or unjust.</td></tr>
<tr><td>Pragmatic knowledge in the form of action strategies (Handlungsstrategien) and pragmatic judgments consisting of e.g. different methodological approaches to cure a disease. Pragmatic rules are wise or unwise.</td></tr>
<tr><td>Technical knowledge in the form of tools for action (Handlungsinstrumente) and technical judgments, e.g. methods that contain practical technical rules for curing a disease. Technical rules are effective or ineffective.</td></tr>
<tr><td>2. Capability (Können)

Actors: Practitioners – citizens, politicians, civil servants, administrators, entrepreneurs can make political decisions.</td><td colspan="2">Practical competence in implementing empirical and practical knowledge, to be able to do something, e.g. the ability of the physician, craftsman, engineer, teacher, manager, politician, scientist to produce outstanding achievements in his or her field.

Capability consists of dispositions, competencies, skills in doing something. This is the area covered under the label of implicit, non-propositional knowledge. This is only one part of expertise (know-how), that of practical capability. Ryle´s conception of know how include what I understand under practical capability and practical knowledge, know that includes analytical and empirical knowledge.</td></tr>
</table>

Chart 11: Knowledge (theory) versus praxis (action)

1. Knowledge (theory): **Sphere of cognition and knowledge**	A *scientist* is *always* a *theorist*, no matter whether he asserts empirical propositions regarding political reality with an empirical methodology or whether he also legitimizes standardizations or regulations using a practical methodology. In the first case, the scientist generates *empirical knowledge*, in the second *practical knowledge*. There are *no* applied sciences, but only practical sciences and scientifically trained *practitioners* who apply knowledge, and *scientists* who generate knowledge.
2. Praxis (action): **Sphere of action**	A *practitioner* (citizen, politician, official, administrator, entrepreneur) changes (political) reality, whether he refers to scientifically based *empirical* and *practical knowledge* and *makes rational decisions*, or makes subjective *gut decisions*. Theory and praxis are considered as *complementary* and not hierarchical. Equivalence between the two, as is usual in the Bacon program, is also rejected.

Chart 12: Relationship between science and politics. Complementary model of policy advice

1. The task of science	Use scientific *tools* in a wide sense to conduct discourses and substantiate *hypothetical answers* to practical political questions in the form of empirical and practical knowledge. Furthermore, one can criticize ideology within scientific discourses, i.e. expose ideologies, subjective opinions and popular slogans.
2. The task of politics or political institutions	To provide *definitive answers* in the form of decisions by means of political discourses and political decision-making procedures and also to assume *liability* (*Haftung*) for all *consequences* associated with regulation. In turn, determining how decision-making procedures and thus legitimacy can best be substantiated is the task of a practical political science.

Chart 13: Empirical and practical ways of argumentation

1. Practical (intentional) inference	"*A* intends to bring about *p*. *A* considers that he cannot bring about *p*, unless he (first) learns (how) to do *a*. Therefore *A* sets himself to do *a*" (from Wright 1971: 101, cf. from Wright 1977c [1963], from Wright 1977d [1972]). "From now on A intends to bring about *p* at time *t*. From now on *A* considers that, unless he does *a* no later at time *t´*, he cannot bring about *p* at time *t*. Therefore, no later than when he thinks time *t´* has arrived, *A* sets himself to do *a*, unless he forgets about the time or is prevented" (from Wright 1971: 107, see Anscombe 1963).
2. Pragmatic syllogism	A *causal theorem* (C) is *equivalent* to a *technical rule* (TR): **C** (**A => B**, if **A**, then **B**) <=> **TR** (**B** per **A** if **B** is desired, do **A**). *Critique*: "Pragmatic syllogism is a result of the pragmatic interpretation of a deductive-nomological explanation and its connection with a normative principle, e.g. that B is desired. Bunge sometimes calls this expression a ´technological rule´" (Kornwachs 2012: 67, translation JL). There is only one *pragmatic*, but no *logical* relation between lawful or regulative *propositions* , e.g. if A, then B, and associated (technical) *rules* or instructions, e.g. B per A, if you want to achieve B , then try A (Kornwachs 2008: 139 and Kornwachs 2012: 64 ff.). There is a difference "between the propositions **A** and **B** and the associated action **A** or a real state **B**, which is put into action by action **A** " (Kornwachs 2012: 65, translation JL). Kornwachs takes this *notation* from Mario Bunge (1967b: 132-139).
3. Deductive-nomological model or HO schema or subsumption theory of the explanation (*covering law model*)	I. Antecedens, singular conditions (**conditio**) **C1**, **C2** [...] **Ck** II. Explanans (the explanatory), general laws (**lex**) **L1**, **L2** [...] **Lk** _____ III. Explanandum, the event to be explained **E** Sources: Hempel 1972 [1966]: 239, see Hempel/Oppenheim 1948 and Popper 2005 [1934].
4. Inversion of causal principles to technical regulations	I. Causal truth-apt statement, **A => B** (if **A**, then **B**) II. Equivalence between causality **A** and action **B**, **A <=> B** (**A** precisely if **B**) or **(A => B** and **B => A**) III. Pragmatic syllogism, **C** (**A => B**, if **A**, then **B**) <=> **TR** (**B** per **A**, if **B** is desired, do **A)** _____ IV. Technical rule, **B** per **A** (if **B** is desired, do **A**). Sources: My own presentation, Equivalence between *causality* and *action* (Bacon 1990 [1620]: 80, 3. Aphorism, Volume 1), *Pragmatic Syllogism* (Bunge 1967b: 132-139 and Kornwachs 2008: 139 and 2012: 64 ff.).

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