



The moral authority of science: Evidence from parliamentary debates in seven countries

Ali Qadir & Jukka Syväterä

To cite this article: Ali Qadir & Jukka Syväterä (2021): The moral authority of science: Evidence from parliamentary debates in seven countries, European Journal of Cultural and Political Sociology, DOI: [10.1080/23254823.2021.1885461](https://doi.org/10.1080/23254823.2021.1885461)

To link to this article: <https://doi.org/10.1080/23254823.2021.1885461>



© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 23 Feb 2021.



Submit your article to this journal [↗](#)



Article views: 249



View related articles [↗](#)



View Crossmark data [↗](#)

The moral authority of science: Evidence from parliamentary debates in seven countries

Ali Qadir^a and Jukka Syväterä ^b

^aNew Social Research and Faculty of Social Sciences, Tampere University, Tampere, Finland;

^bFaculty of Social Sciences, Tampere University, Tampere, Finland

ABSTRACT

Relying on a neo-institutionalist framework of epistemic governance, this article examines the rhetorical function the term ‘science’ plays in the parliamentary discourse of seven countries. Our analysis confirms that ‘science’ is often referred to by members of parliaments throughout the world and across all policy sectors. We find ample references not just to particular sciences, but also to science in the abstract, and find hardly any contests around the mentions of science beyond technical contests around the credibility of a particular result. Our analysis reveals crucial forms of epistemic work conducted by evoking ‘science’ in the abstract. Drawing on and elaborating Durkheim’s view of morality and the framework of epistemic governance, we argue that much of the work done by references to ‘science’ can be characterised as building a moral authority of science.

ARTICLE HISTORY Received 28 February 2019; Accepted 8 January 2021

KEYWORDS Authority; epistemic governance; morality; parliamentary debates; rhetoric; science

Introduction

Recent theorising on policymaking has argued that governance functions by way of taking into account, and working upon, others’ conceptions of the world (Alasuutari & Qadir, 2014, 2016, 2019). From this perspective, governance is epistemic in that people seeking social change try to convince others of a correct or necessary course of action by recognising how those others see the world and then basing their arguments on that view. This is the case for most of political rhetoric, whether agents of social change are in official positions of authority or not. When it is a case of politicians arguing for a new course of action, this epistemic aspect of

CONTACT Ali Qadir  ali.qadir@tuni.fi

© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

governance is readily evident. As has been demonstrated by a growing body of empirical investigations into epistemic governance (e.g. Alasuutari & Vähä-Savo, 2018; Hellman, Hakkarainen, & Saebo, 2016; Ojala, 2017; Paananen, Alasuutari, Karila, & Siippainen, 2020; Pi Ferrer & Rautajoki, 2020; Vähä-Savo, Syväterä, & Tervonen-Gonçalves, 2019), most political rhetoric by actors involved in policymaking can be understood as a window into popular conceptions of reality. Policymakers appeal to justifications that they believe their audiences would accept as natural. Depending on the situation, this can be more or less consciously reflexive: sometimes policymakers plan their speeches and acts cleverly by analysing how they think their audience understand the world, crafting their message accordingly. However, more often than not, they operate with a Wittgensteinian ‘feel’ for the situation at hand, i.e. a sense of what will work and what will not.

Studies on epistemic governance have shown, also, that as part of this feel for a situation, policymakers rely on various sources of authority, when they seek to ground their arguments in existing understandings in order to make their case convincing (Alasuutari, 2018; Alasuutari, Rautalin, & Syväterä, 2016; Rautalin, Alasuutari, & Vento, 2019). Such research has made it clear now that authoritative bodies and figures (including, sometimes, charismatic leaders) are used as grounds to justify a proposed social change. When such a proposal takes place in the parliamentary context of law-making, it makes a case to argue that the evoked authorities are part of the public imagination. After all, the authority in question was referred to precisely because the MP felt it would make a good case for the proposal. Whether or not a parliamentarian is successful in their proposal depends on many factors, but whatever is the outcome, the act of referring to authorities is an elementary part of political argumentation. Thus, the epistemic governance framework leads to pinpointing the authorities that speakers think are convincing in the eyes of wider public. References to coercion-based, knowledge-based, moral, and charismatic authorities abound in political debates in parliaments and beyond. However, when considering the types of authorities that previous studies have uncovered in political talk, most of the literature has focused on what might be termed ontic entities: authorities that are flesh-and-blood, or bricks-and-mortar. Ideals, norms and principles (like democracy, freedom, and the like), are also widely appealed by politicians and other individuals engaged in justifying their actions in the public discourse (Boltanski & Thévenot, 2006; Ylä-Anttila & Luhtakallio, 2016).

Therefore, in this article we ask whether the ideal of ‘science’ is one such authority used in parliamentary debates when proposing a particular form of social change. Even a cursory glance at such debates shows that ‘science’ is referred to extensively. But is it used as authority in debates in the sense similar to a widely held abstract principle or ideal? Or does it take the form of an authority in a similar way than the more ontic, tangible authorities do? If so, what is that form? What use do policymakers put science to, when and how, and where do contests arise?

To address these questions, we examine parliamentary debates on proposed, new legislation and analyse whether, when and how MPs invoke ‘science’ as part of the rhetoric when they seek to convince audience – not only fellow parliamentarians, but also constituents, parties, and wider populations – of the right course of action. Parliamentary debates consist of naturally occurring data that reflects broad socio-cultural premises that speakers expect others will find convincing (Alasuutari, 2016; Fairclough & Fairclough, 2013). When parliamentarians justify an argument by referring to ‘science’, that principle functions as an authority in the sense above. Yet, if that is the case, it is still not clear what the nature of that authority is. Although countless studies touch upon the role of science in parliamentary policymaking, only few have actually focused on this topic. Even these few focus only either on the use of science in individual policy processes or on the role of a particular field of science (Boswell, 2009; Hajer, 1995; Mulkay, 1994, 1995; Tuominen & Turja, 2007). Considerably wider literature around the science-politics interface has largely been concerned with the questions about whether science is used enough, or in appropriate ways, by politicians (Davies & Nutley, 2000; Pielke, 2007; Stevens, 2011). By contrast, our concern is not whether parliamentary discourse in any one country or on any one issue is scientific *enough*. Rather, we take a constructionist stance and map the peculiar rhetorical function that the term ‘science’ plays in political, parliamentary discourse. We build a qualitatively derived account of how the authority of science is built in national political discourse and what that results in.

Much previous literature also assumes that there are national dynamics or national peculiarities in parliamentary discourse (Bayley, 2004). That is, it could be assumed that major variations can be expected in how science is used in parliaments. However, research on epistemic governance suggests quite the contrary. Albeit not directly related to science, studies on epistemic governance argue that parliamentary

discourse around the world is rather similar in nature, just as parliaments themselves are unexpectedly similar despite tremendous variations between political cultures around the world. Parliaments, in this sense, are examples of world cultural institutions, as argued by world society scholars (Meyer, Boli, Thomas, & Ramirez, 1997).

The article is organised as follows. In the next section, we briefly review sociological neoinstitutionalism's perspectives on the authority of science. We start from world polity theory's argument that science plays a role of an enormous cultural authority in the modern world polity. Then we present the framework of epistemic governance, which, we argue, enables us to clarify how such cultural authority actually works when looked from a bottom-up perspective. We also link this perspective to a Durkheimian notion of authority, thus clarifying what we mean by 'moral authority'. This leads to a section where we elaborate the research questions, our data consisting of parliamentary debates, and methods utilised in the empirical analysis. After that, we present the results of our analysis in three sections. First, we discuss overall characteristics of science-talk in parliamentary debates, then we zoom in on such mentions of 'science' wherein it is used as an abstract category, and finally we discuss when and how the usage of science is contested. These results confirm some understandings from studies in the rhetoric of science, justification theory, and from world polity theory regarding the widespread acceptance of science as a rhetorical tool to justify political action and arguments largely in the same manner around the world. However, our analysis extends beyond this generic finding to outline the particular ways in which science is invoked in political discussions and the curious absence of any contests around the abstract term in what is overtly a morally determined forum: the parliament. In this sense, characterising the political use of 'science' further, we find that it fulfils Durkheim's criteria of a moral authority, as we discuss in the final section.

Theoretical background

Authority of science in the world polity

Many popular accounts of the role of science emphasise the instrumental utility of science, either because science is conceived to serve the functional needs of society, or because it works in the interests of scientists or other elite groups like capitalists or governments. Hence, science's authority in policymaking is seen as based on scientists' capacity to

provide objective and trustworthy knowledge about the world. However, several key theorists in science studies have emphasised the cultural authority of science. Influential authors like Bruno Latour (2012) and Steven Shapin (2010) have argued that science and politics are always impure, inseparable categories, although modern thinking compulsively tries to separate them. Studies have shown, for instance, that the translation of scientific results into facts that can be implemented in political programmes and policies is a process demanding hard work (e.g. Bijker, Bal, & Hendriks, 2009; Guston, 1999; Jasanoff, 1994). They have shown, too, that scientific knowledge is rarely disinterested (e.g. Moore, Kleinman, Hess, & Frickel, 2011). Thus, empirical studies have mostly focused on the production of science or scientific experts' activities and internal politics. When usage of science in policymaking has been studied, the focus has generally been on single policy processes, most often in cases where science was expected to have an important role. However, this scholarship has had little to say about the authority of science as a global phenomenon. Although it has done much to make sense of actors involved in 'scientific governance' (e.g. Irwin, 2008), the wider legitimisation and authority of science is often assumed and not problematised.

Yet, the general authority of science cannot be understood by studying only the people engaged in science production. This has been well established by a long tradition of rhetorical analysis of science in political argumentation, launched as the modern study of the rhetoric of science in the 1980s as part of the linguistic turn in the human sciences (Gross, 1996). The fundamental idea is that science is a rhetorical activity, or a 'suasive dialogue' (Edmondson, 1984, p. 62), like any other genre of writing or speech. As rhetoric, scientific knowledge is not simply 'objective' or 'neutral', but rather scientists use various rhetorical techniques to convince their peers of the correctness of their theory, for instance as shown about Darwin in Campbell's (1986) seminal study. In a related vein, rhetoricians of science argue that science policy or popularisation gives scientific results an entirely new rhetorical life that can significantly hide from view the constraints of the original results, making them seem more 'certain' than they were presented as (Fahnestock, 1998).

Whether it is by scientists themselves or by those reporting on science, the point is that science communication (even by the scientist to herself) is a rhetorical activity replete with all the techniques identified by analysts since Aristotle. However, most rhetorical analyses of science have concentrated on a specific discipline or case with the aim of identifying

these techniques or have compared how different rhetorical techniques have been employed in different cases. There has been little attention to how scientists and others actually recruit their audiences and the general public to acquire the broader legitimacy to make claims. Our research addresses this by identifying how politicians scaffold their specific argument in a general approach that supports their use of a scientific result. Unlike most rhetorical analysts, we focus not on the rhetorical techniques but on how the general validity of using those techniques is built, partly by building the authority of science in the abstract to frame the use of this or that scientific result. There has been some scholarly attention to the general role of ‘science’ and ‘facts’ in political debate since 2016 (e.g. Skinnell, 2018), but this largely laments the drop in evidence-based policymaking and, in seeking to restore science to politics, often imagines some rhetorically neutral version of science that is untenable. Moreover, most rhetoric of science studies are based in the U.S. or Europe and do not offer much evidence of the role of science in political argumentation in the rest of the world. Or, they assume that other social contexts will have very different acceptability levels of science. This paper not only includes data from countries often overlooked in rhetoric of science studies, but also puts assumptions of cultural context to the test.

Here, the paper connects with the studies of science in world polity theory, in which scholars also begin by arguing that scientific authority is not a property of the scientist, but of the wider society that confers and endorses this authority (Drori, Meyer, Ramirez, & Schofer, 2003, pp. 28–30). Thus, this tradition has shown that practices and institutions of science have expanded throughout the world, regardless of country-specific features or local power configurations (Drori et al., 2003; Drori & Meyer, 2006; Schofer, Ramirez, & Meyer, 2000). These studies have focused attention on several examples of scientific research that can go against elite interests instead of one-sidedly advancing them, e.g. setting norms for human rights and environmental protection. Thus, the approach has taken critical distance from functional explanations of social change and pointed out that world culture shapes local decision-making in all policy areas (Frank, Hironaka, & Schofer, 2000; Koenig, 2008; Meyer & Bromley, 2013; Meyer, Ramirez, Frank, & Schofer, 2007; Schofer & Meyer, 2005). A crucial process through which world culture impacts local decision-making is scientisation, a trend that has radically accelerated worldwide since World War II (Castilla, 2009; Drori et al., 2003; Drori & Meyer, 2006; Schofer, 1999; Zapp, 2018).

As a cultural model, science shapes society in diffuse and tacit ways, instead of being used mainly for instrumental purposes. This view perceives scientisation as a cultural phenomenon: '[S]cience props up the necessary model of the universalized and lawful environment in response to which a scientifically understandable agentic actorhood is obviously correct and desirable' (Drori et al., 2003, p. 24). In other words, modern science functions as the secular equivalent of a 'sacred canopy' that defines the world around us. The functional value attached to science, as well as the idea that science provides trustworthy knowledge about the world, are both integral parts of this cultural model, but they alone cannot fully explain its dramatic expansion throughout the globe and all sectors of societal life. Science is not simply an instrumental tool: it also has profound ontological and legitimating role in world society (Drori et al., 2003; Drori & Meyer, 2006; Meyer & Jepperson, 2000). In some ways, this is analogous to the role religion had in most societies. Part of the authority of science rests on its being removed from actual practices, like from political decision-making. Its authority is drawn from 'institutionalized myths of scientific knowledge' (Drori & Meyer, 2006, p. 60) and from experts who are to create such knowledge. Indeed, scientists *must* not be actual practitioners but rather disinterested advisers to 'real' actors (Drori et al., 2003, p. 25).

Moral authority in epistemic governance

Although world polity theorists argue that the cultural authority of science is a prime example of how world culture shapes the local decision-making throughout the globe, they have not studied how it is reflected in actual national decision-making, e.g. how politicians invoke the authority of science in political discourse. This gap is in large part because the research design in World Polity Theory is typically operationalised as 'diffusion', in this case a trend of scientisation flowing from the West to the rest. Such a perspective tends to brush aside the fact that it is local policymakers and other political actors who actually take decisions and deploy certain authorities to justify those decisions. Even given a world culture that legitimates the deployment of science, it is not immediately clear what forms such culture of reliance on science takes in national policymaking.

What use do individual actors put this cultural authority to, when and how, and where is it contested? Can we say more about science's authority than that it is 'cultural'? In this paper, we focus on parliamentary debates

on new laws to describe the role of 'objective' science in what is, *ipso facto*, a morally defined activity: legislative discourse. This article contributes to previous sociological institutionalist studies on science by: (1) providing additional evidence of the spread and rhetorical deployment of science worldwide in a largely unexamined site of world culture, viz. parliaments; (2) developing a qualitative description of key features of how science is deployed in these sites and what work it does; and (3) highlighting the largely uncontested authority that science commands around the world in supporting moral arguments for making new laws. Thus, we engage with sociological institutionalism's critical insight into the cultural authority of science but seek to elaborate how it works in actual national political rhetoric. We make a case for describing the authority of science as what Durkheim referred to as 'moral authority.'

Authorities can be, and typically are, used to justify the argument along each dimension of epistemic work. By authority we refer not to an overt position of domination, but to a legitimated source of expertise (albeit with 'legitimation' in the widest, cultural sense and not restricted to Weber's (1922/1978) bureaucratic/legal system).

In the case of parliamentary talk, any authority invoked must be very broadly legitimate, since the audience of a parliamentarian is society at large. Therefore, reliance on scientific authorities in parliamentary talk presupposes a broader, paradigmatic reliance on the idea of science itself. Speakers assume that by invoking a scientific authority they can convince others because they believe people are willing to be convinced of a course of action when a scientific authority is invoked to that end. Durkheim foreshadowed this:

Opinion, eminently a social thing, is one source of authority. Indeed, the question arises whether authority is not the daughter of opinion. Some will object that science is often the antagonist of opinion, the errors of which it combats and corrects. But science can succeed in this task only if it has sufficient authority, and it can gain such authority only from opinion itself. All the scientific demonstrations in the world would have no influence if a people had no faith in science (Durkheim, 1912/1995, p. 210).

Following Durkheim (1924/2010, p. 45), we refer to this broad, paradigmatic acceptance as 'moral authority', and thereby connote Durkheim's desirability of moral behaviour beyond Kantian imperatives of duty. That is, for Durkheim, 'the individual cannot accept moral norms as binding merely because they are imposed ... one must be convinced of their moral propriety as well' (Hall, 1987, p. 71). The social nature of

morality was paramount in Durkheim's work, especially in his later writings and lectures. This led to his emphasis on authority: 'By authority we must understand that influence which imposes upon us all the moral power that we acknowledge as superior to us' (Durkheim, 1925/1961, p. 29). Durkheim's test of morality is instructive: if the consequences of an action violating a rule (such as using the word 'science') are a direct result of that action, then the 'rule' is not a moral one; if, however, the consequences of violating a rule are a result of social sanction alone, then the rule is a moral one. This view underlines the social norms or ideals underlying moral authorities, irrespective of where their authority originates. For Durkheim, the most obvious moral authorities were those that almost never were recognised because there was hardly any contest around them.

Most studies in the 'new' sociology of morality emphasise social sanction (for an overview see Hitlin & Vaisey, 2013). For instance, moral desirability underlies 'utilitarian' reform of higher education that runs entirely against local utility (Qadir, 2014; Young, 1996). Or, American attitudes toward homosexuality correlate strongly with where people place moral authority, in science or religion, marked by little intra-group conflict (Whitehead & Baker, 2012). Similarly, (Hall, 1997) shows how money or military capability were built as moral authorities in pre-sovereign Europe, and argues that any moral authority 'acquires utility as a power resource to the extent that it is institutionalised as a convention' (Hall, 1997, p. 594). The primary characteristics of a moral authority thus are: (1) activation in all cases where a 'rule' is violated; (2) taking the form of social sanctions, often institutionalised as conventions; (3) reflecting autonomy of action, or desirability rather than imposition; and (4) lacking substantial contestation. In our case, empirical investigation can clarify whether reliance on scientific authorities or arguments implies science as a 'moral authority', as well as what is done when that authority is invoked. If science can be well described as carrying a moral authority in these four ways, that sharpens its character from the vaguer notions of 'cultural authority'. We operationalise this test in three research questions.

Data and methods

Research questions

From an epistemic governance perspective, it should be evident that actors seeking social change mention science as an authority to convince

others because they presume that this rhetorical act will work. Yet, we still need to know more about how politicians actually refer to science in their argumentation. Our first question is: how is 'science' evoked in political rhetoric across countries and policy sectors? Our analysis begins from examining frequency of 'science' mentions and then goes on to examine what is meant by science, what sciences are mentioned, and what kind of argumentative sequences unfold when 'science' is invoked.

Even a cursory glance at political talk shows that 'science' is often discursively used as an abstract principle that hardly needs to be explained. This imparts it an ontological status that in some way shapes the way the world appears to policymakers. Therefore, our second question is: what kind of epistemic work is done when 'science' is invoked in the abstract? This includes studying to what extent mentions of 'science' are linked to broad-based world cultural scripts of modernisation and progress.

This leads us back to the broad, paradigmatic acceptance of science as a moral principle – as a 'cultural canopy' or 'cultural frame' (Drori et al., 2003). We have little evidence about where and when 'science' as an abstraction provides broad authority for an argument relying on a particular science, and what characteristics such abstract usage has. So, our third question is: to what extent are there contests around the mentions of science in political rhetoric across countries and sectors? What are these contests about? It can be hypothesised that policy contests around science would be grounded in epistemological concerns about whether evidence from a particular science is 'correct' in a particular situation. But are there conflicts around abstract notions of science? In light of World Polity Theory, 'science' should not be much contested, since the reliance on science is a worldwide cultural phenomenon particularly in those sectors where the sense of actor agency (in this case, policymakers' sense of capability to determine actions) is strong.

Finally, in light of our findings we discuss whether 'science' in the abstract fulfils the main characteristics of moral authority: (1) does this authority activate in all cases where a 'rule' is violated; (2) does it take the form of social sanctions, often institutionalised as conventions; (3) does it reflect autonomy of action, or desirability rather than imposition; and (4) does it lack substantial contestation. Thus, our empirical investigation clarifies whether invocations of science in political discourse can be seen drawing from moral authority of science.

Parliamentary debates as data

Our data consists of a stratified random sample of 840 parliamentary debates on new legislation that took place between 1994 and 2013 in Australia, Canada, Finland, Trinidad & Tobago, Uganda, United Kingdom, and United States. We selected these countries in accordance to cover great variance (in terms of GDP, geographical location, and generally perceived global political influence), and also because we are able to study these countries' parliamentary debates as they are all either in English (six countries) or in Finnish. The parliamentary systems of six countries from which data is in English are all originally modelled after the British model. While our selection of countries does not cover all possible variations, following basic principles of qualitative research (Gobo, 2008) – and since parliamentary debate culture is so similar across the world – if patterns are found in this sample, it makes a convincing case for generalisation that may be tested in future.

Our data includes 120 debates from each country evenly spread over 20 years. The sample is randomly stratified to represent roughly equal numbers of debates in 10 policy sectors: civic, consumer, crime, education, environment, fiscal, foreign and security, health, science and technology, and social policy. Again, this sample size affords us the opportunity of detecting patterns of similarity and difference across all sectors in parliaments worldwide for future, large-scale analysis. The timeframe is wide enough to smooth out spikes of mentions of 'science' in parliamentary talk in these countries, for instance due to debate on a single bill in which the word would be mentioned often. However, it is not wide enough to make claims about changes in patterns of how 'science' is referred to, nor did we find any such changes over our data.

The most important reason for studying parliamentary debates is that a parliament is an exemplary site of world culture. Parliaments everywhere in modern world society are constituted on remarkably similar principles, having remarkably similar functions, and being similarly legitimated, irrespective of variations in how, say, parliamentarians are elected to a specific house (Alasuutari, 2016, p. 24). In that sense, parliaments are truly sites of world culture, being constituted and legitimated by world cultural scripts of how to organise societal decision-making. Since a key function of any national parliament is to pass new legislation, the debates around new bills offer valuable insights into what principles the legislators utilise in their day-to-day rhetoric. Moreover, the audience

of MPs arguing for or against a bill is not just their fellow parliamentarians but also their party, constituency, interest groups, the national community, and even the world at large. Thus, parliamentary talk offers a window into widely accepted cultural scripts. Even in polities whose parliaments might be ineffectual, members still engage in debate to convince each other, their constituencies, and the world outside, of the right actions.

Analysis methods

Within the data, we undertook a keyword search for ‘science’.¹ The main reason for focusing only on explicit mentions of science is that we want to take a formalist stance in not deciding what is or is not ‘science’ in politics, but rather taking seriously whatever actors themselves term as ‘science’. This allows us to ask what politicians ‘do’ with the word. Again, this does not mean that there are no other synonyms for ‘science’ or that people necessarily only mean one signified by this signifier, which we are out to capture. Scientific authorities or research results are often referred to in many other ways without using the exact word ‘science’ (Syväterä, 2020). However, we are concerned here with how that word is employed. It is, of course, a highly significant word in political discourse, and what we are after is a description of what that significance entails.² Specifically, we are interested in finding out whether invocation of ‘science’ carries moral authority. If it does, later studies can be extended to examine whether this holds for also in the case of more subtly references to science. To keep the focus on the rhetorical usage of the term, we cleaned out occurrences where the term is a part of a proper name, such as ‘Minister of Science and Technology’.

We coded the remaining 846 mentions of science along three independent variables: year, country, and policy sector. These mentions were spread over 219 debates. Next, we extracted paragraphs containing all 846 mentions and utilised qualitative discourse techniques for analysis. For that, we read the context surrounding the paragraph where science is mentioned, although our illustrative extracts here only include those specific paragraphs for the sake of brevity.

We undertake two layers of qualitative analysis with this data. The first layer examines all paragraphs that include a mention of science. We employed a coding protocol comprising several items in coding these paragraphs:³

1. Is the reference to a particular science?
2. Is the reference to science in the abstract?
3. Is the reference to science as a subject in school or university?
4. Is the reference linked to the idea of progress?
5. Is there a conflict or contest around the mention of science?

In regard to the first three points, only dummy variables are used: 0 (no) or 1 (yes), while the latter two points are coded on a scale: 0 (no), 1 (some) or 2 (considerable, definitely). The count results are presented in the next section. Employing Pearson chi-square tests, we analyse frequencies and associations between science mentions in different debates belonging to different policy sectors and according whether the referent of 'science' is a particular science, science in the abstract, or science as a school subject. Phi coefficients are examined to measure the strength of association between the binary categorical variables. The second layer focuses on rhetorical analysis elaborating two important observations produced by the first layer: the widespread use of science in the abstract (341 paragraphs), and the cases of conflict around the mentions of science (82 paragraphs).

Results

Characteristics of 'science' talk in seven parliaments

We analysed 846 instances of utilising 'science' as a rhetorical resource. We found more mentions of science in the United States (278) and Australia (162 mentions) than from the other five countries (66–96 mentions in each).⁴ A closer look shows, however, that the greatest number of references to 'science' in the two countries results from the fact that the sample includes certain, individual debates in which the term is mentioned very frequently. In general, our analysis shows remarkable homogeneity in the frequency of the use of the word 'science' across all these otherwise very different countries. We do not find any remarkable temporal change in usage of the term 'science' over the 20 years of our data.⁵

We coded each mention of 'science' by utilising the coding protocol described in the previous section. The count results are presented by policy sector in [Table 1](#). The mentions of science are spread across all policy sectors. There are, however, clear differences in frequency of science mentions between the 10 policy sectors. Not surprisingly,

Table 1. Occurrence of mentions of science by policy sector.

	Science & technology (n = 259)	Education (n = 154)	Environment (n = 147)	Health (n = 72)	Fiscal (n = 61)	Social (n = 20)	Foreign & security (n = 16)	Others, incl. Civic, Consumer, and Crime (n = 117)
Science as a particular term	99	63	90	55	29	12	10	63
Science as an abstract term	192	48	71	17	36	15	7	63
Science as a school subject	24	103	4	5	13	0	4	21
Science contested (mildly)	17	4	28	12	2	3	0	3
Science contested (definitely)	7	0	1	1	1	0	0	3
Connected to progress (mildly)	50	17	21	19	24	2	3	9
Connected to Progress (definitely)	36	5	6	5	7	0	0	9

science is mentioned most often in science & technology debates. Also, the term is referred to in education policy and environmental policy far more frequently than in average debates. Health policy and fiscal policy debates contain more mentions than the remaining sectors. Foreign & security policy and social policy contained the fewest number of references to ‘science’.

In all mentions of science, the term is used to denote at least one of the following: a school subject, a particular science, or science in the abstract. These three uses are not mutually exclusive – several paragraphs include two of these uses and in a few cases all three occur in the same paragraph. **Table 2** shows how three referents of ‘science’ are associated with policy sectors (five policy sectors with most mentions of science are included in the table). In the following two sub-sections we examine more closely how ‘science’ figures either as particular or in the abstract. About a fifth of all mentions are linked to a school subject, and majority of these occur in education policy debates. Because the mentions of science as a school subject do not typically use science as a justification for reforms – rather, they are linked to debates over science education, we do not examine them separately.

Particular science

We coded a paragraph as referring to a particular science when a specific scientific field was mentioned, or it was obvious that the speaker meant one particular science. Although almost half of the paragraphs refer to a particular science, and the mentions occur across all policy sectors, mentions of particular sciences correlate negatively with science & technology and education policy debates. On the other hand, in health and environmental policy debates it is much more typical to refer to a particular science than science in the abstract. Not surprisingly, in health policy

Table 2. Statistical relationship between referents of ‘science’ and the policy sector. Pearson Chi-Square values and Phi measures of association reported.

Policy sector	Referent of science		
	Particular field	Abstract	School subject
Science & Technology	19.883** (-.153)	66.461** (.280)	29.180** (-.186)
Education	5.904* (-0.84)	6.213* (-0.86)	247.209** (.541)
Environment	9.348** (.105)	1.628 (-.044)	34.684** (-.202)
Health	22.316** (.162)	27.428** (-.180)	8.940** (-.103)
Fiscal	.130 (-.012)	.932 (.033)	.22 (.005)

* $p < 0.05$.

** $p < 0.01$.

debates a particular science – medicine or a subfield – is often mentioned, while environmental policy debates often mention climate science or other fields directly related for study of environmental problems.

There are several ways through which speakers seek to make their argument more convincing via reference to a particular science, making it an ‘authority’ for the case. Through inductive close-reading of the data we identified three most typical ways, of which illustrative examples are provided below:

1. *Justifying a reform or action with scientific evidence:*

However, we can all read the advice of the Committee on Climate Change and look at the science in the build-up to the Copenhagen talks. I am persuaded by the science, as we should all be, that it is necessary to act now, not, as the Government proposes, in 10 years’ time—that is not good enough (MP Hughes, British House of Commons, 2009, Industrial Carbon Emissions Bill, c. 635).

2. *Emphasising the importance of an issue by pointing out that it has scientific grounding:*

We must pay more careful attention to the long term effects of war that for a long time have been ignored: post-traumatic stress disorder, depression and the effects on the family that are so often hidden. In fact, historically after World War I and World War II many of these problems were buried but now that medical science and others have taken a more active interest, these problems are coming to light (MP Martin, Canadian House of Commons, 2000, Civilian War-Related Benefits Act, p. 8532).

3. *Presenting an authority as eligible to have a say in a given debate:*

The hon. member for Arua municipality holds a Ph.D. in agricultural science. He knows what to do better than myself (MP Byaruhanga, Parliament of Uganda, 2001, The Animal Breeding Bill, Uganda, p. 24).

In the first example, the moral authority of science is clearly visible where climate science is referred to in order to demand faster action against climate change. The MP not only refers to scientific facts but argues that everyone should be persuaded by the science-based advice. It would be morally untenable to dismiss the advice in the legislation. In the second example, an MP refers to developments in medical science when he defends a bill aimed to extend provisions received by veterans also to certain civilian groups. Science has unveiled adverse long-term effects war has in lives of individuals and families: the results of medical science obligate parliament to reform existing legislation.

While the first and the second way of referring particular science as an authority are close to each other, analytically they differ from each other when it comes to the relation between scientific results and political action. The first way derives the proper ways of acting directly from scientific results (or from the scientific policy advice, which translates results into recommended action). In the case of the second way, the actions are not directly dictated by science (or related policy advice), but the results of science only demonstrate the importance of an issue. In the third example, an MP underlines the scientific training held by another MP in a field relevant for the debate on animal breeding. Expertise on particular science makes an MP more authoritative in a particular issue. We could easily imagine, for instance, that the third example was not about animal breeding but carbon emissions, then it would have been a Ph.D. in meteorology or environmental sciences that would make a person's statements weightier.

As the examples above illustrate, a moral aspect is often linked to the references to the particular science. In each example, 'science' is something that should not be disregarded. Thus, it is the general authority of 'science' that makes particular sciences authoritative in each example above.

Science in the abstract

A bit over half of all paragraphs mentioning science refer to it as an abstract category and these references are spread through all policy sectors. While these references often occur within debates where particular sciences are also discussed, such references are typically broadened to make arguments about the relation of science to decision-making in general. Thus, it is understandable, that the mentions of science in the abstract correlate very strongly with the policy sector of science and technology policy. However, we find that in general, too, regular references to 'science' in the abstract in all policy sectors is striking. Even in sectors like environmental policy, where there are also more references to a particular science, science is also often referred to in the abstract. Below, we highlight three most typical ways of projecting 'science' in the abstract:

1. As a basis for making a particular decision:

Given that there is already a ban on advertising during children's programmes, would it not be more appropriate to determine whether that ban is effective? If

that were determined to be the case, he might be better able to persuade those of us who are extremely sceptical and think that this is just a ‘something must be done’ Bill, rather than a Bill that will have any effect; indeed, this Bill might even have perverse consequences. We could then move forward in the knowledge that some science backs up the Bill (United Kingdom, Food Products (Marketing to Children) Bill, 2008, c. 1589).

2. *As an object of regulation:*

The examples of those two practices could be used to build public confidence as the Bill proceeds. We shall all be very proud that, following the tragedies that have occurred, we have found a way of restoring public confidence, not only in the practice of taking tissues but in science and medicine generally (United Kingdom, Human Tissue Bill, 2004).

3. *As an enterprise to be fostered:*

Countries with strong science and technology have registered rapid economic growth ... science is at the heart of development (Uganda, The national agricultural research bill 2004, 24.5.2005).

All the examples highlight the rhetorical function and moral authority involved in science mentions. The moral authority becomes well visible in the first example wherein a bill is opposed because it does not rely on science. In parliamentary discourse the abstract notion of science is often employed to support a particular decision: although it is uncommon to provide actual scientific results in any detail, it is much more typical to refer to expert bodies or their reports, thus creating an impression that ‘some science backs up the Bill’. Thus, this category functions essentially the same way as the first subcategory in the ‘particular science’, even if in this case no particular results or scientific fields are mentioned. The second example points to potential unintended dangers involved in the advancement and use of science, implicating a need to regulate science. The concern about degrading public confidence on science, as denoted in the example, illustrates how the authority of science itself is seen as worthy of defending, even so that politicians can be proud if they are successful in this endeavour. The third example frames science as an enterprise to be fostered, because it conceived fundamentally important for economic growth. Thus, it is science’s perceived functional value, which makes it so important. But even stronger moral imperative for fostering science follows from the idea of progress – a highly cherished value in all nation states throughout the world polity – which appears to be seamlessly linked to science.

Progress

Mentions of science in the abstract, indeed, positively correlate with presence of the idea of societal progress (see Table 3). In order to focus on world cultural agendas of progress, we looked for the keywords ‘advancement’, ‘modernization’, and ‘improvement’, but also recognised subtle ways to frame an issue with the idea of progress.

Table 3 shows correlations between the idea of progress and science mentions according to whether science is referred as a particular field, in the abstract, or as a school subject. It shows, also how progress correlates with science mentions belonging to five policy sectors (only those five policy sectors with largest number of mentions of ‘science’ are included in the Table). Progress has strong positive correlation with fiscal policy as well as with science and technology policy. Mentions of science occurring in education and environmental policy debates, show a significant negative correlation with of the progress frame, which is clearly linked to the fact that within these two sectors science is less often referred in the abstract.

Closer look on mentions of progress shows qualitative variance between policy sectors. While such mentions occur mostly when science is discussed as an abstract category (like most clearly in the case of science and technology policy), there is a notable exception of health policy, wherein the references to particular sciences are often linked to progress. Medical science, especially the promise of biotechnology, stands out in many debates as something that will transform the known world. In general, however, progress clearly is more often related to references to abstract science, than limited to notions of any particular sciences:

Table 3. Relation of the idea of progress to ‘science’ mentions in four policy sectors and according to whether science is referred as a particular field, in the abstract, or as a school subject. Pearson Chi-Square values and Phi measures of association reported.

Referent of ‘science’	Science as a particular field	.209 (–.016)
	Science as an abstract term	11.584** (.117)
	Science as a school subject	10.573** (–.112)
Policy sector	Science & technology policy	12.768** (.123)
	Environmental policy	5.841* (–.083)
	Education policy	9.937** (–.108)
	Health policy	2.779 (.057)
	Fiscal policy	22.946** (.165)

Note: Progress is taken here as a binary variable (mild and definite categories are merged together).

* $p < 0.05$.

** $p < 0.01$.

I am not trying to suggest that this will solve the problem, but I am saying there is a wealth of talent in this country, and our reluctance to be innovative and implement the science and technology that is taking place in the world today will only keep us back. We will remain in the dark ages. We have to go forward (Trinidad and Tobago, Parliament 2000, Debates (Deoxyribonucleic Acid (No. 2) Bill), p. 887).

Overall, the strong presence of the idea of progress in relation to rhetorical use of science supports World Polity arguments about the widespread belief in the functional value of science. The idea that funding science benefits the national economy in economic competition is widely prevalent and hardly ever challenged. However, in our sample these results are skewed toward the policy sector of science itself, and not so prevalent in other sectors. References to broad, cultural agendas of modernisation and progress are strongly linked to referring science as an abstract category. When progress is strongly linked to science, there a deeply moral tone is characteristic. Speakers typically appeal to a collective sense of higher purpose that must be pursued via fostering advancement of science.

Contests around science

By ‘contests’ we mean situations where there is a conflict about (1) what science means; (2) whether science is appropriate at all in this case; or (3) whether science has been applied appropriately in the case. We find that contests occur nearly as often around abstract notions of science as around mentions of particular science. However, our main finding is that contests around science are relatively uncommon: we find some conflict in only about a tenth of our sample, of which 13 were more pronounced or explicit, and 69 were relatively minor. Interestingly, compared to other sectors, contests are relatively more frequent in

Table 4. Relation of the contests to ‘science’ mentions in four policy sectors and according to whether science is referred as a particular field, in the abstract, or as a school subject. Pearson Chi-Square values and Phi measures of association reported.

	Science as a particular field	1.056 (.035)
	Science as an abstract term	.021 (.005)
Referent of ‘science’	Science as a school subject	20.916** (–.158)
Policy sector	Science & technology policy	.077 (–.010)
	Environmental policy	20.469** (.156)
	Education policy	10.828** (–.113)
	Health policy	6.288* (.086)
	Fiscal policy	1.712 (–.045)

Note: Contest is taken here as a binary variable (mild and definite categories are merged together).

* $p < 0.05$.
** $p < 0.01$.

environmental and health policy sectors (see Table 4): those two sectors, where mentions of ‘science’ correlate positively with particular science (Table 2).

However, there are hardly any contests at all in our first two categories of conflict. Parliamentarians almost never contest what science *means* in a particular case, or whether it is appropriate to be ‘scientific’ at all in this bill. We find considerably more evidence of contests of the third type, i.e. around whether science has been applied appropriately in the particular case debated. For instance:

The decisions that have been presented to us by this bill have nothing to do with whether science is good or science is bad, but whether it passes the ideological litmus test of the Republican leadership. Thus, I again stress that this should not be a partisan debate, but the issue has, much to my regret, been politicized (United States, Omnibus civilian science authorization act of 1995).

The only evidence one can cite for using smokeless tobacco to quit is inadequate. It’s not based on science, and I’m sure it will be a tremendous boon to the smokeless tobacco industry (United States, Family Smoking Prevention and Tobacco Control Act 2009, p. 9633).

In general, contests mostly concern the credibility of scientific results. In some sense, they are not contests *about* science, but *within* science: the argument is typically that a particular point is not scientific *enough*.

In addition to credibility contests we also find instances of contest around the use of science for particular purposes. These contests occur around dilemmas framed as ethical and concern the question of how best to put science to use in a particular policy issue. For instance, in the debate concerning legislation on biobanks, a Finnish MP emphasised the importance of public control, because if they were left to private business the result might be that humans are biologically ‘enhanced without caring about ethical principles’ (Finland, Parliament 2011, *Debates (Hallituksen esitys eduskunnalle biopankkilaiksi (Biobanks Bill))*, p. 8).⁶ This is a more relevant area of contest for our argument, but we do not find similar examples from most policy areas. Moreover, the contests in all these cases are about the best *application* of science, not about whether science is applicable at all. Science *per se* retains its broad-brush authority, but the contest is about whether this particular application is ethical or not.

The observation we found most striking is that no parliamentarian in all 846 instances of mentioning science in these seven countries has ever argued that science is irrelevant to the debate or cannot solve the problem at hand. While there are no cases in our data where a speaker would

explicitly be against science, there are several examples where other politicians are *accused* of being *against* science, and thus taking immoral actions by violating the normative authority of science:

There are some people in this building who argue that science is not absolute. For instance, some people have argued in the course of the climate change debate that the science is not absolute, and therefore we will not really know who was right and who was wrong until it happens or does not happen. The science is not absolute on smoking and lung cancer either; yet we believe, because the scientists tell us so, that there is a relationship between lung cancer and cigarettes (Australia, House of Representatives 2011, *Debates (Tobacco Plain Packaging Bill)*, pp. 9272–9273).

Discussion and conclusion

In this paper we sought to characterise the epistemic work done by the term ‘science’ in parliamentary discourse across seven countries. We found that rhetorical reliance on science is spread across all policy sectors, although with some variations. Notably, parliamentarians rarely mention science when discussing foreign and security policy, or fiscal policy, even though both policy areas are marked by a strong sense of agency (parliamentarians taking charge of a situation on behalf of their respective nations and populations). Moreover, we found that even when particular sciences are referred to, a general, abstract sense of what science is, props up their legitimacy. Underlying much of the science talk we found a trend of linking science to societal progress and modernisation. While progress is typically linked to medical advances and biotechnology in health debates, it correlates even more strongly with discussing science as an abstract category.

The explicit reliance on science as an abstract category of justification in parliamentary talk is striking. Given the tendency to ‘evidence-based’ decision-making, more references to actual scientific results might be expected in specific sectors, e.g. in health and social policy (Bogenschnieder & Corbett, 2011; Davies & Nutley, 2000; Sanderson, 2002). Of course, underlying these is an implicit sense of the unquestionable authority of science. However, our results also show that, in addition to rhetorical usage of concrete research results, policymakers explicitly talk about science in the abstract and expect such rhetoric to be convincing. The usage of science in the abstract is not only linked with notions of societal progress, but often translates into concrete measures such as budgetary

allocations, concrete proposals to foster or regulate science, and the like. Moreover, science is used to criticise other speakers, for instance by claiming that they are not scientific enough or have polluted science with politics.

Science in the abstract was rarely ever contested in the parliamentary debates analysed. When contests around the mentions of 'science' occurred, they were minor and technical in nature. This finding illustrates two aspects of parliamentary talk. *First*, policymakers appear to assume that if they mention science, even without discussing a particular science, their argument will be well received and not contested. Others may occasionally object to precise details or may note that science has not been 'correctly' applied in the argument, but generally a conflicting view will simply shift the ground to some other, openly moral and negotiable aspect of the debate. *Second*, the picture that is thereby constructed and accepted is of science as an objective representation of reality. In this sense, parliamentarians are part of society that accords authority to the universal applicability of science. Unlike the recognised relativism of norms, the abstract notion of science appears to afford a universalist bedrock. Indeed, strangely for a body dedicated to political deliberation, the term 'politics' is often portrayed as polluting the objective purity of 'science'. This may be why we see no mention at all of the separation of science and state, while much parliamentary talk about religion is how to keep it from harming the state or being harmed by it.

These findings support the conclusions of rhetorical studies on science and World Polity Theory, which both speak to the importance of science in the legitimisation of political argumentation. However, our empirical investigation has contributed to both of these scholarships with some additional colour. First, we explored the rhetoric of science not amongst scientists and how they communicate to non-scientists, but rather the widespread use of that term in, specifically, political discourse. Furthermore, we find a remarkably widespread acceptance and usage of 'science' in seven diverse countries, irrespective of economic, political, or linguistic variations. This makes a case for further investigating similarities in political discourse across further countries, notably in non-Anglophone and non-Atlantic societies.

The widespread use of science empirically supports World Polity Theory's tenets of science as a cultural phenomenon (Drori et al., 2003). Our investigation shows that parliaments are key sites of the world polity enacting and sustaining the script of science. It also shows that the use of 'science' does not diffuse by itself or by scientific

institutions, but rather is brought into the political field by parliamentarians, who in this sense are important world cultural actors. Moreover, we find that the use of 'science' is not just a cosmic canopy or a support of scientific institutions. Rather, the use enfolds a number of specific characteristics that speak to people's sense of what is good, particularly progress and modernisation. The very widespread use of science in the abstract and the absence of conflict also call for more attention by World Polity Theory to how such abstract terms spread and with what implications. Here, it will also be important to acknowledge that all political claims in the public sphere include moral valuation (Boltanski & Thévenot, 2006; Lamont, 2012; Ylä-Anttila & Luhtakallio, 2016). These aspects taken together call for further investigation into the agency of local actors in deploying many terms, including science, to justify their interests and arguments and not just hypocritically conforming to other societies.

This paper took a step towards bringing together the frameworks of neoinstitutional World Polity Theory and justification theory of moral sociology, in order to specify the nature of science in parliamentary debates in these countries as 'moral authority'. Morality, said Durkheim (2010), begins with membership in a group, and here we are dealing with groups of parliamentarians that represent society at large. Durkheim insisted that modern science had an edge over other religious cosmologies in that it encourages individuals to challenge extant theories through rational inquiry. Yet, he may not have envisaged how much people a hundred years later might accept unquestioningly the authority of science *per se*. Our results show that modern societal reliance on science is one of the 'precepts particularly important to it' (Durkheim, 2010, p. 17). Society at large and parliaments in particular have accorded science a moral authority and conferred an 'obligatory character' upon this reliance.

'Science' talk in parliaments thus appears to pass the four criteria of a moral authority defined earlier: (1) its usage (or avoidance) does not lead to effects in and of itself, but only through social norms; (2) norms take the form of sanctions (or criticisms) that are informally yet quite strictly institutionalized in patterns of talk; (3) desirability is clearly at work, since parliamentarians use the term even without fully defining it in any given case and since its usage generally carries the argument; and (4) there is next to no contestation around the term. The use of science in parliaments participates in and reinforces a 'moral community' that shares a commitment to science *per se*.

Openly moral talk in parliaments is generally reserved for issues that ostensibly are not related to scientific results, and that is where contests abound. When science is brought into the discussion, contests cease, and opponents have no choice but to either claim that the argument is not 'truly' scientific or to shift the debate back to openly normative grounds. So, while the purpose of science (and especially of particular sciences) is to provide epistemological grounds for an argument, this emerges also as a canopy for its normative authority. In other words, the moral authority of science is upheld most effectively by not disclosing it as a moral authority. While further investigation is now called for in more countries and with data spanning more time, our results already point to the implications of science's moral authority when considering more and more policy contests around the world that invoke 'science'.

Notes

1. The data from six countries is in English. For the Finnish debates, we used keywords 'tiede' and 'tiete*' and combed out the results not equivalent with 'science'.
2. From this description, and our approach throughout, it is obvious that we are employing 'science' typically as a term used in our data, so always at a critical distance and in 'scare quotes'. However, to sidestep the burden this would cause in reading, we drop the quotation marks, which are nevertheless notionally present.
3. The coding was conducted in a team of three, and a check of inter-reliability (a random 5% of the debates were coded by all team members) resulted in an agreement level of between 88% and 96% for each of the questions (using sample-based variance), at an average agreement level of 90%. After discussion on the pilot, coding agreement increased to 95%, and more random checks throughout the coding ensured overall reliability.
4. Number of paragraphs, where the word 'science' is utilised as a rhetorical resource in seven countries: Australia (n = 162), Canada (n = 92), Finland (n = 96), Trinidad & Tobago (n = 77), Uganda (n = 66), United Kingdom (n = 75), United States (n = 278).
5. The science mentions are temporarily spread in following way (here organised into five-year periods): 1994–1998 (n = 236), 1999–2003 (n = 182), 2004–2008 (n = 185), 2009–2013 (n = 240).
6. Translated from Finnish by the authors.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by Kulttuurin ja Yhteiskunnan Tutkimuksen Toimikunta: [Grant Number 25012960451].

ORCID

Jukka Syväterä  <http://orcid.org/0000-0001-5387-667X>

References

- Alasuutari, P. (2016). *The synchronization of national policies. Ethnography of the global tribe of moderns*. London: Routledge.
- Alasuutari, P. (2018). Authority as epistemic capital. *Journal of Political Power*, 11(2), 165–190.
- Alasuutari, P., & Qadir, A. (2014). Epistemic governance: An approach to the politics of policy-making. *European Journal of Cultural and Political Sociology*, 1(1), 67–84.
- Alasuutari, P., & Qadir, A. (2016). Imageries of the social world in epistemic governance. *International Sociology*, 31(6), 633–652.
- Alasuutari, P., & Qadir, A. (2019). *Epistemic governance: Social change in the modern world*. London: Palgrave Macmillan.
- Alasuutari, P., Rautalin, M., & Syväterä, J. (2016). Organisations as epistemic capital: The case of independent children's rights institutions. *International Journal of Politics, Culture, and Society*, 29(1), 57–71.
- Alasuutari, P., & Vähä-Savo, V. (2018). Owning worldwide principles: The case of American exceptionalism. *Social Science Information*, 57(4), 533–552.
- Bayley, P. (2004). *Cross-cultural perspectives on parliamentary discourse*. Amsterdam: John Benjamins.
- Bijker, W. E., Bal, R., & Hendriks, R. (2009). *The paradox of scientific authority. The role of scientific advice in democracies*. Cambridge, MA: MIT Press.
- Bogensneider, K., & Corbett, T. J. (2011). *Evidence-based policymaking: Insights from policy-minded researchers and research-minded policymakers*. New York: Routledge.
- Boltanski, L., & Thévenot, L. (2006). *On justification. Economies of worth*. Princeton, NJ: Princeton University Press.
- Boswell, C. (2009). Knowledge, legitimation and the politics of risk: The functions of research in public debates on migration. *Political Studies*, 57(1), 165–186.
- Campbell, J. A. (1986). Scientific revolution and the grammar of culture: The case of Darwin's origin. *Quarterly Journal of Speech*, 72(4), 351–376.
- Castilla, E. J. (2009). The institutional production of national science in the 20th century. *International Sociology*, 24(6), 833–869.
- Davies, H. T., & Nutley, S. M. (2000). *What works?: Evidence-based policy and practice in public services*. Bristol: Policy Press.

- Drori, G. S., & Meyer, J. W. (2006). Global scientization: An environment for expanded organization. In G. S. Drori, J. W. Meyer, & H. Hwang (Eds.), *Globalization and organization: World society and organizational change* (pp. 50–68). Oxford: Oxford University Press.
- Drori, G. S., Meyer, J. W., Ramirez, F. O., & Schofer, E. (2003). *Science in the modern world polity: Institutionalization and globalization*. Stanford, CA: Stanford University Press.
- Durkheim, E. (2010). *Sociology and philosophy*. (D. F. Pocock, Trans.; 2nd ed.). London: Routledge. (1953) (Original work published 1924).
- Durkheim, É. (1961). *Moral education*. (E. K. Wilson & H. Schnurer, Trans.). Cambridge: The Free Press (Original work published 1925).
- Durkheim, É. (1995). *The elementary forms of the religious life* (Repr. ed.). Cambridge: The Free Press (Original work published 1912).
- Edmondson, R. (1984). *Rhetoric in sociology*. London: Palgrave Macmillan.
- Fahnestock, J. (1998). Accommodating science: The rhetorical life of scientific facts. *Written Communication*, 15(3), 330–350.
- Fairclough, I., & Fairclough, N. (2013). *Political discourse analysis: A method for advanced students*. London: Routledge.
- Frank, D. J., Hironaka, A., & Schofer, E. (2000). The nation-state and natural environment over the twentieth century. *American Sociological Review*, 65(1), 96–116.
- Gobo, G. (2008). Re-conceptualizing generalization: Old issues in a new frame. In P. Alasuutari, L. Bickman, & J. Brannen (Eds.), *The SAGE handbook of social research methods* (pp. 193–213). London: Sage.
- Gross, A. G. (1996). *The rhetoric of science*. Cambridge, MA: Harvard University Press.
- Guston, D. H. (1999). Stabilizing the boundary between US politics and science: The role of the office of technology transfer as a boundary organization. *Social Studies of Science*, 29(1), 87–111.
- Hajer, M. A. (1995). *The politics of environmental discourse. Ecological modernization and the policy process*. Oxford: Oxford University Press.
- Hall, R. B. (1997). Moral authority as power resource. *International Organization*, 51(4), 591–622.
- Hall, R. T. (1987). *Emile Durkheim: Ethics and the sociology of Morals*. Westport, CT: Greenwood Press.
- Hellman, M., Hakkarainen, P., & Saebo, G. (2016). Underpinnings of tobacco policy: An epistemic governance perspective. In M. Hellman, V. Berridge, K. Duke, & A. Mold (Eds.), *Concepts of addictive substances and behaviours across time and place* (pp. 151–168). Oxford: Oxford University Press.
- Hitlin, S., & Vaisey, S. (2013). The new sociology of morality. *Annual Review of Sociology*, 39, 51–68.
- Irwin, A. (2008). STS perspectives on scientific governance. In E. J. Hackett, O. Amsterdamska, M. Lynch, & J. Wajcman (Eds.), *The handbook of science and technology studies* (pp. 583–607). Cambridge, MA: The MIT Press.
- Jasanoff, S. (1994). *The fifth branch. Science advisers as policymakers*. Cambridge, MA: Harvard University Press.

- Koenig, M. (2008). Institutional change in the world polity: International human rights and the construction of collective identities. *International Sociology*, 23, 95–114.
- Lamont, M. (2012). Toward a comparative sociology of valuation and evaluation. *Annual Review of Sociology*, 38, 201–221.
- Latour, B. (2012). *We have never been modern*. Cambridge, MA: Harvard University Press.
- Meyer, J. W., Boli, J., Thomas, G. M., & Ramirez, F. O. (1997). World society and the nation-state. *American Journal of Sociology*, 103(1), 144–181.
- Meyer, J. W., & Bromley, P. (2013). The worldwide expansion of “organization”. *Sociological Theory*, 31(4), 366–389.
- Meyer, J. W., & Jepperson, R. L. (2000). The “actors” of modern society: The cultural construction of social agency. *Sociological Theory*, 18(1), 100–120.
- Meyer, J. W., Ramirez, F. O., Frank, D. J., & Schofer, E. (2007). Higher education as an institution. In P. J. Gumpert (Ed.), *Sociology of higher education: Contributions and their contexts* (pp. 187–221). Baltimore, MD: Johns Hopkins University Press.
- Moore, K., Kleinman, D. L., Hess, D., & Frickel, S. (2011). Science and neoliberal globalization: A political sociological approach. *Theory and Society*, 40(5), 505–532.
- Mulkay, M. (1994). The triumph of the pre-embryo: Interpretations of the human embryo in parliamentary debate over embryo research. *Social Studies of Science*, 24(4), 611–639.
- Mulkay, M. (1995). Galileo and the embryos: Religion and science in parliamentary debate over research on human embryos. *Social Studies of Science*, 25(3), 499–532.
- Ojala, M. (2017). *The making of a global elite: Global economy and the Davos Man in the Financial Times 2001–2011*. University of Helsinki. Helsinki.
- Paananen, M., Alasuutari, M., Karila, K., & Siippainen, A. (2020). Epistemic governance in local policy debates: The case of entitlement to early childhood education and care in Finland. *European Journal of Cultural and Political Sociology*, 7(1), 52–74.
- Pi Ferrer, L., & Rautajoki, H. (2020). Navigating coercion in political rhetoric: Shifting strategies to cope with intervention by the Troika in Portugal. *Contemporary Politics*, 26(2), 206–225.
- Pielke, R. A., Jr. (2007). *The honest broker: Making sense of science in policy and politics*. Cambridge: Cambridge University Press.
- Qadir, A. (2014). The ideal of utility in British Indian policy: Tropes of the colonial chrestomathic university, 1835–1904. *South Asia: Journal of South Asian Studies*, 37(2), 197–211.
- Rautalin, M., Alasuutari, P., & Vento, E. (2019). Globalisation of education policies: Does PISA have an effect? *Journal of Education Policy*, 34(4), 500–522.
- Sanderson, I. (2002). Evaluation, policy learning and evidence-based policy making. *Public Administration*, 80(1), 1–22.
- Schofer, E. (1999). Science associations in the international sphere, 1875–1990: The rationalization of science and the scientization of society. In J. Boli & G. M. Thomas (Eds.), *Constructing world culture: International nongovernmental organizations since 1875* (pp. 249–268). Stanford, CA: Stanford University Press.
- Schofer, E., & Meyer, J. W. (2005). Worldwide expansion of higher education in the 20th century. *American Sociological Review*, 70, 898–920.

- Schofer, E., Ramirez, F. O., & Meyer, J. W. (2000). The effects of science on national economic development, 1970-1990. *American Sociological Review*, 65(6), 866–887.
- Shapin, S. (2010). *Never pure: Historical studies of science as if it was produced by people with bodies, situated in time, space, culture, and society, and struggling for credibility and authority*. Baltimore, MD: Johns Hopkins University Press.
- Skinnell, R. (2018). *Faking the News: What rhetoric Can Teach Us about Donald J. Trump*. Exeter: Imprint Academic.
- Stevens, A. (2011). Telling policy stories: An ethnographic study of evidence in policy-making in the UK. *Journal of Social Policy*, 40(2), 237–255.
- Syväterä, J. (2020). Tieteen monitahoinen auktoriteetti: Analyysi uutta lainsäädäntöä koskevista täysistuntokeskusteluista [The multifaceted authority of science: An analysis of debates on draft laws in the Parliament of Finland]. *Sociologia*, 57(1), 44–64.
- Tuominen, K., & Turja, T. (2007). Use of social scientific information in parliamentary discussion. In E. D. Garten, D. E. Williams, J. M. Nyce, & S. Talja (Eds.), *Advances in library administration and organization* (Vol. 25, pp. 133–154). Amsterdam: Elsevier.
- Vähä-Savo, V., Syväterä, J., & Tervonen-Gonçalves, L. (2019). The authority of Meta-organizations: Making the International association of national public health institutes attractive to prospective members. *European Journal of Cultural and Political Sociology*, 6(4), 474–502.
- Weber, M. (1978). *Economy and society: An outline of interpretive sociology*. Berkeley: University of California Press (Original work published 1922).
- Whitehead, A. L., & Baker, J. O. (2012). Homosexuality, religion and science: Moral authority and the persistence of negative attitudes. *Sociological Inquiry*, 82(4), 487–509.
- Ylä-Anttila, T., & Luhtakallio, E. (2016). Justifications analysis: Understanding moral evaluations in public debates. *Sociological Research Online*, 21(4), 1–15.
- Young, R. J. C. (1996). The idea of a Chrestomathic University. In *Torn Halves: Political conflict in literary and cultural theory* (pp. 184–221). Manchester: Manchester University Press.
- Zapp, M. (2018). The scientization of the world polity: International organizations and the production of scientific knowledge, 1950-2015. *International Sociology*, 33(1), 3–26.