

From Science to Politics: Commissioned Reports and their Political Translation into White Papers

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1 Introduction

In our imagination, bureaucracies operate in a pyramid structure with the sovereign or the government at the top and the subordinates situated at various levels in the hierarchy. Nowadays, evidence produced at the lower levels is supposed to inform political decisions at the top level. Tullock succinctly explains the “standard model of bureaucracy” as follows:

The lower levels of the structure receive information from various sources. This information is then passed along upward through the pyramid. At the various levels, the information is analyzed, collated, and coordinated with other information that originates in separate parts of the pyramid. Eventually, the information reaches the top level where the basic policy decisions are made concerning the appropriate action to be taken. These decisions are then passed down through the pyramid with each lower level making the administrative decisions that are required to implement the policies sent from on high. (Tullock 2005, 149, cited in Cowen 2018, 7)

In Norway, this standard model of bureaucracy is institutionalized: prior to issuing a reform, the government appoints commissions with a mandate to review past and current experiences and make recommendations for further action. Based on the recommendations of these Norwegian Official Commissions or NOUs [*Norges offentlige utredninger*], the government takes political action. The two governance tools, White Papers (issued by the sovereign) and Green Papers (prepared by commissions), carry the typical features of a standard model of bureaucracy that attempts to be transparent, accountable, and democratic. In fact, the authority of a reform is built on the interplay between the various levels of the pyramid.

In addition, in an era of evidence-based policy planning, the government-appointed commissions in Norway are not only composed of government officials and stakeholders representing different interest groups, but also include academics. In fact, the proportion of academics serving in NOUs has increased to an extent that Christensen and Hesstvedt (2018) have made it their research project to study the “expertisation” of ad-hoc commissions in Norway. Unsurprisingly, the Green Papers of the 21st century contain numerous references to studies, reports, and academic literature. Political decisions “sent from on high” (Tullock 2005, 149) rest, at least rhetorically, on the policy knowledge produced and the “evidence” collected in these subordinate, government-sponsored commissions. As elaborated in other publications, any study of institutionalization needs to draw attention to how policy actors edit or translate bureaucratic norms, practices, and behaviors into their own context (see Czarniawska and Sevón 2005; Steiner-Khamsi and Waldow 2012).

The shift to knowledge-based regulation and, as a corollary, “the rise of expertocracy” has been documented by many scholars (Grek 2013; Boswell 2017; Fenwick, Mangez and Ozga 2014). In comparison, what is studied less is the relationship between expert knowledge and political knowledge, that is, between Green Papers (produced by expert commissions) and White Papers (produced by the government). This study attempts to fill this gap by paying attention to the political translation process, that is, the transfer from the scientific level (Green Papers) to the political level (White Papers).

In this study, we first compare expert commissions’ reference patterns for the two most recent school reforms in Norway to understand the institutionalized evidence-based policy planning practice over time, and then focus on one reform to further investigate the political translation of scientific knowledge. In doing so, we are “studying up” in order to investigate what the Ministry of Education and Science has adopted, learned, or borrowed from its own expert commissions (Fontdevila and Verger 2019; Nader 1969).

Arguably, research regarding how governments actually use commission reports is relatively sparse. Such an investigation, captured well in the German term *Verwendungsforschung* [research on usage], requires a relational method of inquiry in order to assess how the Ministry of Education and Research dealt with the evidence produced in the reports, notably whether it incorporated the references produced in its commission into its own White Papers, and if it did, which texts it cited and to what extent. Concretely, we examined whose knowledge—the knowledge of which commission(s)—the Ministry of Education and Research incorporated into its White Papers.

The academic curiosity in understanding the political usage of scientific evidence is driven by the apparent “over-production of evidence” found in today’s policy architecture, including in reports produced by NOUs. As Lubienski succinctly states:

Into the chasm between research production and policymaking, we are seeing the entrance of new actors—networks of intermediaries—that seek to collect, interpret, package, and promote evidence for policymakers to use in forming their decisions. (Lubienski 2019, 70).

Different from the US context, where a large number of public *and* private organization compete over providing useful scientific advice for policy making, the “chasm between research production and policy making” (Lubienski 2019, 70) is supposed to be bridged in the form of the NOU expert commissions. Although the government-appointed commissions in Norway produce a “market place of ideas” (Lubienski 2019), only particular (expert-produced or scientific) Green Papers function as intermediaries between science and politics and have a (political) impact. We therefore have a keen interest in understanding the impact of scientific advice on policy formulation, and more specifically, in identifying the commissions that gained prominence during the political translation process.

2 Context and research design

Norway lends itself for a case study on the coupling between science and politics, because the government explicitly commits to evidence-based policy planning. It generously funds sector research (known as “institute sector”) and has institutionalized scientific policy advice in the form of

NOUs. As mentioned above, the proportion of academics serving on NOUs has increased significantly at the expense of interest group representatives (Christensen and Hesstvedt 2018). As the Eurydice Report (European Commission/EACEA/Eurydice 2017, 10) points out, it is a national context in which “evidence is used at all stages of the policy process.”

Our research group carried out a bibliometric network analysis of the two most recent school reforms in Norway¹: the Knowledge Promotion Reform of 2006 and the Curriculum Renewal/Quality Improvement Reform of 2020. A comparison across the two time periods reveals fascinating changes in the use of “evidence” as well as the network structure of the texts cited in Green and White Papers.

In addition to comparing the bibliometric network features of the two reform periods, we draw in this study our attention to a phenomenon that was especially pronounced in the 2006 reform: the five NOUs draw on vastly different knowledge to substantiate their reviews and recommendations vis-à-vis the government. From the 464 references cited in the Green Papers, only five texts (one percent) were shared by more than one commission. This finding suggests the existence of a highly specialized policy knowledge among the government-appointed commissions.

The low frequency of co-citations among the Green Papers is not surprising *per se* in the Norwegian policy context as it reflects the pragmatic mandate of commissions to advise the Ministry of Education and Research on a particular topic. As we will present later in this article, these specialized ad-hoc commissions indeed gather an impressive amount of knowledge. Given the “over-production of evidence” (Lubienski 2019) in such commissions, the question becomes: Whose evidence has the Ministry of Education and Research used for justifying its political decisions? More specifically: Which commissions were influential, and which texts cited in the Green Papers of the commissions, also surface as “evidence” at the political level, that is, are also cited in the White Papers?

Our research design enabled us to carry out two kinds of comparison: (i) across time (reform period 2006 and 2020) and (ii) across policy levels (scientific and political). First, we compared the type of references listed in the relevant White Papers and Green Papers across the two reforms. In addition, we compared the references used in the White Papers with those in the Green Papers for the 2006 reform. The first type of comparison enabled us to examine changes in reference patterns over time, and the second afforded insights into the political translation process.

As explained elsewhere (Steiner-Khamsi and Gorur 2019, 165ff.), it is necessary to expand comparative education beyond the study of cross-national similarities and differences. In line with other scholars, we challenge the “methodological nationalism” assumed in earlier, reductionist definitions of comparative studies (Wimmer and Glick Schiller 2003, 576; Robertson and Dale 2008).

¹ The research group consists of Kirsten Sivesind (leader of the project), Berit Karseth, Diana Tiplic, and Bernadette Hörmann from the University of Oslo and Gita Steiner-Khamsi, Oren Pizmony-Levy, and Chanwoong Baek from Teachers College, Columbia University. Gita Steiner-Khamsi also serves as UTMAM Visiting Professor or R2 Professor at the University of Oslo. This study is part of the research project “Policy Knowledge and Lesson Drawing in Nordic School Reform in an Era of International Comparison,” funded by the Norwegian Research Council, project number 283467.

In fact, this comparative study focuses, as mentioned above, on comparison across reform periods and policy levels within one and the same national context.

2.1 The 2006 and 2020 school reforms

Some background information on the two reforms may be in order here.

The *first reform* that went into effect in 2006 is known as the “Knowledge Promotion Reform.” The Ministry of Education and Research explained the reform in the following two White Papers:

- Early Intervention for Lifelong Learning (Ministry of Education and Research, 2006)²
- Culture for Learning (Ministry of Education and Research, 2003)³

The 2006 reform is considered a fundamental reform as it replaced two earlier reforms of primary and lower secondary curricula as well as upper secondary education. It represented a shift from input-oriented policy instruments toward output-oriented tools such as measurable objectives, standardized tests, and data-based planning (Møller and Skedsmo 2013). As pointed out by other researchers, the reform was partly motivated and legitimated by the results of the PISA test, released in December 2001 (see Skedsmo 2018). PISA 2000 generated reform pressure given its unanticipated results; not only did students in Norway score at around the average, the test also showed that the disparities in learning outcomes were greater than expected (Imsen and Volckmar 2014; Møller and Skedsmo 2013). Alarmed by the PISA findings, the government concluded that the school system had serious weaknesses in need of immediate repair. To meet these challenges, the ministry suggested the introduction of a national testing system and attempted to improve the competencies of teachers, school leaders, and administrators through the establishment of a “culture of learning” (Karseth and Sivesind 2010). Furthermore, the reform propelled increased decentralization and local autonomy on one hand, and increased accountability on the other.

The revised national curriculum specified competencies in terms of students’ measurable learning outcomes. Emphasis was placed on learning basic or foundational skills that were supposed to be integrated in all subjects and in all grades (Imsen and Volckmar 2014). The two White Papers of the 2006 also pioneered a new discourse on holding key actors, such as local authorities, school principals, and teachers, more accountable for the performance of schools. To do so, a national quality assessment system was introduced alongside the curriculum reform (Møller and Skedsmo 2013), and national testing was implemented in 2004. For the first time, the test results were published and made publicly available. It became possible to benchmark, rank, and compare schools. Without any doubt, the shift toward outcome monitoring represented a radical break with and departure from the traditional input-based regulation in Norwegian education (Helgøy and Homme 2016).

The *second reform* examined in this study is the “Curriculum Renewal/Quality Monitoring Reform” that will go into effect in 2020. It is a two-pronged reform that builds on, and confirms, the previous

² The White Papers are written in Norwegian. The original Norwegian title is “... og ingen sto igjen. Tidlig innsats for livslang læring” (Report No. 16 to the Norwegian Parliament, 2006/07).

³ In Norwegian: “Kultur for læring” (Report No. 30 to the Norwegian Parliament, 2003/04).

reform of 2006. In this article, we examine two White Papers that the Ministry of Education issued in 2015 and 2016, respectively, when it announced the 2020 reform:

- Renewal of the Norwegian Knowledge Promotion Reform (Ministry of Education and Research 2015)⁴
- Quality Monitoring Reform (Ministry of Education and Research 2016)⁵

In contrast to the fundamental reform of 2006, which radically changed the approach to how the quality of education was supposed to be improved—moving from an input to an outcome orientation—the 2020 reform merely signaled an incremental reform, improving what had already been issued a decade earlier. The Ministry of Education and Research preserved the main tenets that were introduced during the previous reform. However, some shortcomings of the 2006 reforms had become cause for public concern. First, the curriculum was seen as “overloaded,” leading the Ministry of Education and Research to suggest that priorities in terms of content knowledge and subjects needed to be made based on evidence and formative evaluation (Baek et.al. 2018). As formulated by the Minister of Education and Research in a press release:

What pupils learn in school is of major importance to our collective future, and we believe the time is ripe to update the subject matters. This will be a long-term renewal effort that builds on the Knowledge Promotion Reform, thus ensuring continuity for teachers and pupils alike. (Ministry of Education and Research 2016)

Second, as a result of prioritization and the emphasis on “deep learning,” the Ministry of Education and Research mandated that the key elements for each school subject be defined in greater detail. Third, acknowledging the importance of social development, three interdisciplinary topics are given high priority: democracy and citizenship, sustainable development, and public health and wellbeing. Fourth, the reform introduces remedial measures for students with low achievements in reading, writing, and numeracy in the grades 1 to 4. Among the many improvements that the 2020 reform intends to achieve, one more is worth mentioning: the reform re-confirms test-based accountability in which local authorities are held accountable for student learning outcomes in the schools of their district.

2.2 Sampling and database

In bibliometric network analyses, correct sampling is essential because the database consists of the sampled source documents and the references that are listed in them, either as footnotes or in a separate reference section at the end of the document. The source documents had to fulfill the following criterion: they had to constitute “official policy knowledge” and consist of texts that either the Ministry of Education and Research itself or its appointed NOUs produced in preparation of a particular school reform. The following three sampling steps were taken to ensure that all relevant

⁴ English translation of the full title: Subjects – In-depth learning – Understanding. Renewal of the Norwegian Knowledge Promotion Reform. In Norwegian “*Fag – Fordypning – Forståelse. En fornyelse av Kunnskapsløftet*” (Report No. 28 to the Norwegian Parliament, 2015/16)

⁵ English translation of the full title: Eager to learn. About early intervention and quality in schools. In Norwegian: “*Lærelyst – tidlig innsats og kvalitet i skolen*” (Report No. 21 to the Norwegian Parliament, 2016/17)

White and Green Papers (treated as source documents) were taken into consideration and entered into the text corpus. In a first step, the relevant White Papers were identified based on an evaluation of all White Papers produced over the time periods in question and based on a review of the Norwegian policy studies literature that comment on the two reforms. After the first step, four White Papers were identified.

In a second step, all Green Papers mentioned in the four White Papers were extracted and reviewed. The search yielded a total of five Green Papers for the 2006 reform period and twelve Green Papers for the 2020 reform (see Appendix 1). The breakdown by reform is presented in Table 1.

Table 1. Interrelations of the documents in the database

Reform	2006 Knowledge Promotion Reform		2020 Curriculum Renewal/Quality Monitoring Reform	
Source Documents	WP, n =2; GP, n = 5		WP, n =2; GP, n = 12	
White Papers	WP (2006/2007) «Early intervention for lifelong learning»	WP (2003/2004) «Culture for learning»	WP (2015/16) «Subjects – in-depth learning – understanding»	WP (2016/17) «Eager to learn»
Green Papers	GP 2646; GP 36; GP 57; GP 59	GP 5596; GP 57; GP 59	GP 51; GP 55; GP 57; GP 60; GP 91; GP 92; GP 93	GP 41; GP 42; GP 50; GP 53; GP 54; GP 92
References*	674		3,285	
Total**	677		3,286	

* Number of documents that are cited directly in both White Papers or Green Papers (source documents are also counted as long as they are cited)

** Total = N of source documents + N of references - N of source documents that are referenced

Each text entered in the dataset was given a unique identification number, and we created a square reference-by-reference matrix using the identification numbers. Each cell of the matrix indicates if document X (row) is cited by document Y (column) or not. If the document was cited, then the code 1 was entered in the cell and if not, the code 0 was entered. Based on this matrix, we calculated in-degree centrality and analyzed co-citations to understand the reference networks of the Norwegian 2006 and 2020 reforms. In-degree centrality measures how many times a given document is cited by other documents. A document with higher in-degree centrality is considered prominent or prestigious (Hanneman and Riddle 2005) because it signals to what extent other documents in the network desire to establish connections with the document to make an argument. Furthermore, co-citations demonstrate how different groups of references are connected to each other and what knowledge bridges different groups. Last, each text in the networks was coded by a series of attributes: (i) year of publication, (ii) publisher/authoring organization, and (iii) location of publication/authoring organization (domestic/Norwegian, international, and Nordic/regional).

The software programs UCINET 6.627 and NetDraw 2.160 were used for data analysis and visualization (Borgatti, Everett, and Freeman 2002). For network visualization, we applied the Multidimensional Scaling (MDS) layout in which nodes that are more “similar” to each other are

placed closer together (Hanneman and Riddle 2005). The similarity indicates the shortest paths that each node is connected to other nodes (Hanneman and Riddle 2005).

3 The bibliometrical network analysis: Findings

The two research questions, explained above, may be reformulated in ways that allow us to theorize about the policy process: (i) What counts as evidence at the stage of policy preparation? and (ii) How is the evidence used at the stage of policy formulation? For the first question, we examined the evidence production that occurs at the lower level of the state bureaucracy in the Green Papers across the two reform periods. For the second research question, we focused on the “upward translation” process, as manifested in the White Papers. The first research question helps us to understand the work of the Norwegian Official Commissions, notably, whose knowledge the NOUs consider relevant for their review and recommendations. For the second research question, we examined how the Ministry of Education and Research uses the Green Papers of its commissions.

3.1 Reference patterns over time

The study found significant changes in the reference patterns over time in terms of (i) frequency, (ii) visibility, (iii) type of references, and (iv) style of references. First, the White and Green Papers prepared for the 2020 period more than doubled their use of references. The 2006 reform averaged 96 references per White or Green Paper, compared to 234 references on average for the 2020 reform. Second, an endeavor to signal the use of knowledge for policy reviews, recommendations, or formulation was clearly discernible in how the references were listed. Three of the Green Papers of the 2006 reform did not include a separate reference section; instead, the references were either listed in the footnotes (n=2) or not at all (n=1). Finally, publication location of the references differs significantly by reform, as shown in Table 2. Only 20.55 percent of all texts cited in the relevant White and Green Papers of the 2006 reform were published outside of Norway or the Nordic region. In contrast, international texts comprised 27.17 percent of all texts cited in the official texts for the 2020 reform.

Table 2. References in White and Green Papers by Reform Period and Location

Locations	2006		2020	
	Count	Percent	Count	Percent
Domestic	309	71.36	2002	65.77
Regional	35	8.08	215	7.06
International	89	20.55	827	27.17
Total	433	100.00	3044	100.00

Note 1: $\chi^2 = 8.63$; $p < .05$

Note 2: 241 references cited by both reforms were excluded for the analysis

Having said this, it is important to put the findings in perspective and point out a few broader developments in the areas of publishing, notably the trend towards greater output, better accessibility, more international collaboration, and disciplinary shifts within educational research, which we also noticed in our bibliometrical analysis.

First, the exponential growth of academic publications has been amply documented for the natural sciences (Wagner, Whetseel, and Leydesdorff 2017), the social sciences, and educational research (Powell, Baker, and Fernandez 2017). Jonathan Adams (2013) found that OECD countries have more than doubled their national research output over the past thirty years. Reporting on bibliometrical studies of EU countries in particular, Marcelo Marques (2018) asserts that EU countries account for 34 percent of all worldwide publications. Within the EU member states, the three Nordic countries (Denmark, Sweden, and Finland) have the highest productivity, measured in terms of publications per million inhabitants.

Second, greater accessibility is another factor that contributes to the greater impact of research, as measured in how often a publication has been cited. Google Scholar began operations in November 2004, ResearchGate in 2008, and Academia.edu scaled up its reach in 2011, reaching in 2018, over 68 million subscribers. Over the same period, open access to Norwegian documents has improved considerably. Starting in 2009, the Norwegian Research Council, for example, required that all peer-reviewed scientific articles that are partially or fully funded by the Research Council be archived in an open access electronic repository. In a similar vein, the government of Norway issued a decree in 2017 whereby all publications funded from public sources must be made openly accessible by the year 2024 (Ministry of Education and Research 2017). Norway's government has not been alone with instating policies that ensure open access to knowledge products.

Third, several studies found that the large output in publications has been mainly driven by the massive increase in international collaboration. Multinational co-authorship has become common (Zapp, Marques, and Powell 2018). In 2014, one in four scientific articles were the product of an international collaboration effort, as stated in UNESCO's *Science Report* (UNESCO 2015). The collaboration across national boundaries led Adams (2013) to suggest that research has progressed through four different stages: individual, institutional, national, and international. He also coined the term "impact premium" (Adams 2013, 559) to describe the fact that publications with an internationally mixed authorship are cited on average 20 percent more than publications by purely domestic authors. Due to the increasing international collaboration, bibliometric studies share the concern regarding how to accurately capture the location or nationality of an author or of the content. In their comparative study of educational research contents in Germany, the UK, and Norway (1994–2015), Marques et al. (2018) established that every text is considered "international" if it includes at least three international references. Similarly, we developed a protocol regarding how to consistently code the "location" category in our bibliometrical network analysis.⁶

⁶ In general, the place of publication determined whether a text was categorized as national, regional, or international. For example, we considered national OECD reports as international publications if they were published outside Norway. In addition, we developed a protocol for special cases. Among other agreements, we determined that a translated publication, such as the work of Hattie (2009), is considered an international text even if the book was published in Norway.

Finally, we must take into account that the style of references has changed in many academic fields. Arguably, the diminishing role of philosophy and history in educational research is also visible in the style of references away from footnoted references to references listed in a standalone section at the end of a text.

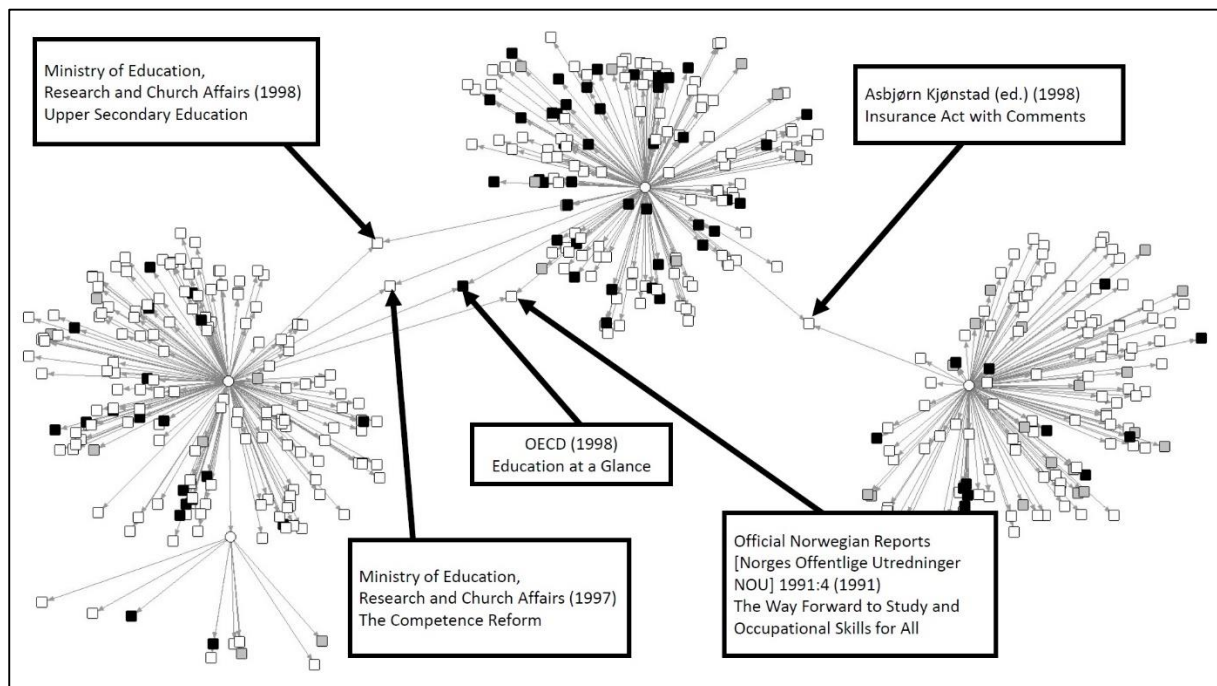
These four general trends in publishing explain to a great extent the changes in the reference pattern between the first and second reform periods, that is, between 2006 and 2020, observed in this study.

3.2 The scientific process of review and recommendations

Most empirical studies on the nexus between science and politics focus on the work of one or two expert commissions that proved to be influential because they were subsequently used and referenced for political decisions. In this study, we analyzed all the Green Papers (produced by commission) that were mentioned in the relevant White Papers (produced by the Ministry of Education and Research). In addition, the network design of this study enabled us to examine the relation between the various expert commissions and investigate whether there is shared knowledge, as reflected in the texts that these commissions reference.

As Figure 1 shows, there is only a small number of co-citations among the Green Papers. From all the 464 references listed in the four Green Papers, there is not a single text that is cited by all commissions. Furthermore, the bibliometric analysis demonstrates that only five references were referenced by more than one commission, and no reference was shared by more than two commissions. This leads us to suggest that the four commissions have produced highly specialized knowledge in their reports. Figure 1 presents the reference networks of the Green Papers for the 2006 reform period.

Figure 1. Green Paper Reference Network, 2006 Reform



Note: Regional=Grey; Domestic=White; International=Black; Source=Circle; References=Square

Moreover, Figure 1 shows that four of the shared references were domestic references and one was international. The international one was OECD's *Education at a Glance* (1998) and the four domestic ones were all government-issued document. Put differently, the four policy-preparing commissions did not share a single academic reference and the only non-government-issued text that they jointly cited was the OECD report (OECD 1998). The OECD report functions as a bridge between two commissions: "Nyttige lærepenger" ("Useful Study Funding—Study Funding through the State Educational Loan Fund"), NOU 1999; Green Paper 36) and "I første rekke" ("In the First Row—Increased Quality within a Basic Education System for Everyone"), NOU 2003; Green Paper 57).

The papers for the 2020 reform were also relatively highly specialized in that only 9.3 percent of the texts were cited by more than one author or organization. Out of 3,087 texts cited by Green Papers, 287 references were co-cited. Although this co-citation rate is still greater than that of the 2006 reform, it is not that surprising given that one arm of the 2020 reform is explicitly stated as a renewal of the past reform and the other arm explicitly built on past experiences with quality monitoring. Utilizing the references from previous commission reports are, therefore, not extraordinary. Clearly, the documents for the 2020 reform reflect the typical features of incremental reforms, that is, they review, build on, confirm, or slightly revise elements of the previous reform.

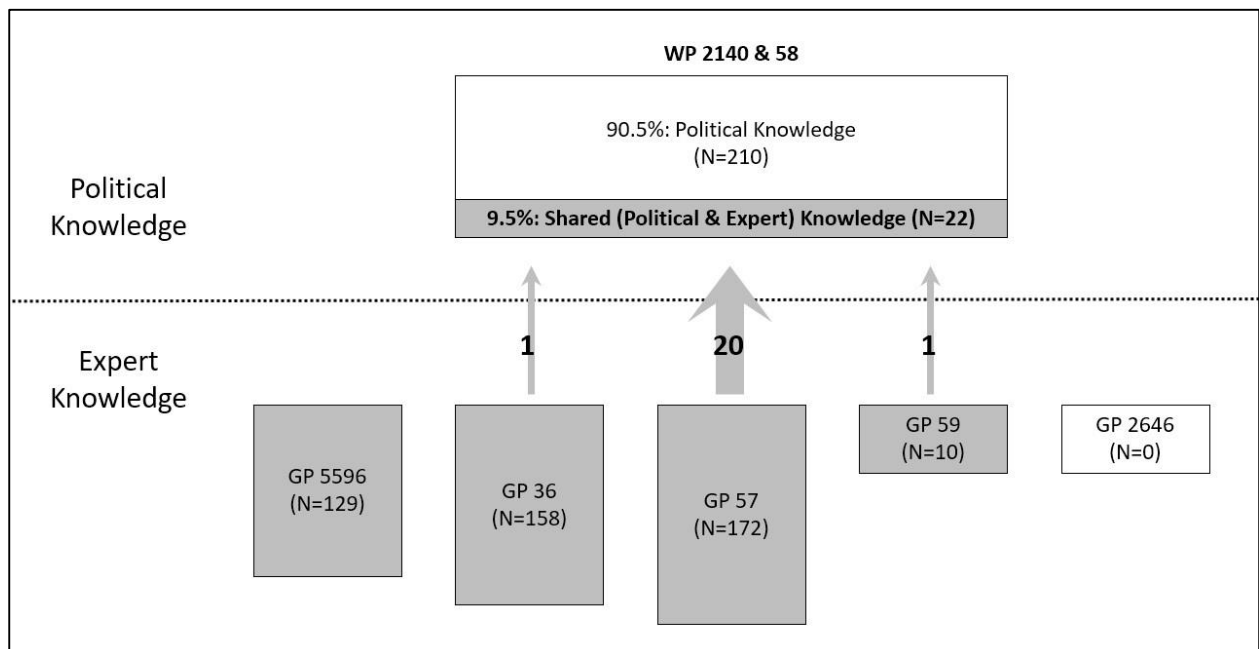
The low proportion of shared knowledge among the commissions, both for the 2006 and the 2020 reform, reveals the pragmatic mandate of NOUs in the Norwegian education sector. These commissions are expected to generate highly specialized knowledge on the specific topic for which they were tasked. Different from other types of government-appointed commissions (see Weingart and Lentsch 2008), the NOUs are task rather than consensus driven. It is important to bear in mind that the highly specialized knowledge opens up a space for the government to selectively transfer what was produced at the commission level to the political level.

3.3 The political process of upward translation

We explored the political translation process, that is, the transfer from scientific knowledge (produced by expert commissions) to political knowledge (produced by government) by asking: from all the references listed in the Green Papers (produced by the government-appointed expert commission), how many are also shared, that is, cited in the White Papers (produced by the Ministry of Education and Research)? In other words, we examined the political translation of expert knowledge.

First, the Ministry of Education and Research uses surprisingly little knowledge produced in its expert commissions. Of the 469 texts that the five commissions cited in their Green Papers, only 22 of them were also referenced in the two ministerial White Papers. This means that 95 percent of the commissions' body of knowledge was lost in (political) translation. The disregard of knowledge amassed in Green Papers is not to be underestimated. The Green Papers of the 2006 reform range from zero references (Green Paper 2646) to 172 references (Green Paper 57). Figure 2 visualizes the nexus between expert and political knowledge. This also means that the Ministry of Education and Research does come up with its own sources of (political) knowledge. In fact, only 9.5 percent of the references (22 references) in the two ministerial White Papers (number 2140 and number 58) are identical with those listed in the commissioned Green Papers. Figure 2 visualizes the nexus between expert and political knowledge.

Figure 2. The Political Translation of Scientific Expertise in the 2006 School Reform



Second, not all commission reports carry the same political weight. From the five commission reports, two White Papers cited the references from the Green Paper "In the First Row" (NOU 2003) by far the most (20 out of 22 references). Not only are the references from the Green Paper "In the First Row" cited the most, they are cited in both White Papers, thereby serving as an "intermediary" (Lubienski

2019) or “network broker” (Menashy and Shield 2017) connecting the knowledge networks of the two White Papers.

The important role of the Green Paper “In the First Row” (NOU 2003) can be explained by its specific mandate and the composition of the commission. The commission was tasked with producing an overall analysis of the education system and producing recommendations regarding how to improve the quality of education. In compliance with the mandate, the Green Paper draws attention both to compulsory and upper secondary education. Strikingly, the report focuses very much on recommendations from OECD and the Definitions and Selections of Competencies (DeSeCo) project and makes a case for a competency-based curriculum. In addition, it reconfirms the need for a national testing system that would allow for monitoring quality improvement in schools. The global language of OECD is not to be overheard, and the report comes across as an “indigenization” or a national adoption of OECD education policies. Both recommendations of the Green Paper “In the First Row” (NOU 2003)—the shift toward competency or outcomes-based curriculum reform and the introduction of test-based accountability—carry features of school reforms that the OECD has propelled globally, including in Norway, and merit the label “global education policy” (Mundy et al. 2016), or in this particular case “OECD education policy.” In policy-borrowing research, we would use the Green Paper “In the First Row” (NOU 2003) as a typical example of externalization; references to experiences elsewhere and to the authority of OECD are made to justify the need for fundamental reform.

In addition, what explains the great political weight of the Green Paper “In the First Row” is its composition. The commission consisted of seventeen members. Several members were affiliated with the government and, in fact, held key positions in the public administration of the education sector. The chair was Astrid Sjøgnen, a former state secretary in the Ministry of Education (1995) who later became the director of the Education Agency in Oslo (2000). The head of the secretariat was Petter Skarheim who became the first director of the Norwegian Directorate for Education and training (2004) and later the Secretary General of the Ministry of Education and Research (2016). Thus, close ties between science and politics already existed at the commission level, facilitating the subsequent political translation process at the ministerial level.

Third, a question arises as to whose knowledge the Ministry of Education and Research has drawn on if we exclude the knowledge produced or put forward by its commissions. Table 3 summarizes the qualitative analysis of the 210 texts cited in the two White Papers for the 2006 school reform. We used the typology of Christensen and Holst (2017) to categorize the texts.

Table 3. Qualitative Analysis of the References in the Two 2006 White Papers

Category	Description	N	Aggregated
Nat'l policy documents	Produced by national and local government bodies	46	61% Government or government-sponsored
Nat'l policy research	Commissioned research: “Institute Sector,” research centers, Norwegian Statistics Bureau, and policy research/analyses produced by consultants	81	

Nat'l academic research	Peer-reviewed books (N=20), journal articles (8), and non-peer reviewed research reports produced by higher education institutions (6)	34	21%
Int'l academic research	Books (4) and journal articles (6)	10	Academic
Int'l policy documents	Produced by EU (2) and UNESCO (1)	3	13%
Int'l policy research	Produced by OECD (18), Nordic organizations (4) and other international organizations (3)	25	Int'l organizations
Interest groups, think tanks, etc.	Teachers Union (1) and Forum for Adoption (1)	2	5%
Others	Mostly unpublished reports, manuscripts, and online resources	9	Other
Total		210	100

A disaggregation of the 210 references (90.5 percent of all references made in the two White Papers; see Figure 2) reveals that the Ministry of Education predominantly relies on government sources; 61 percent of all cited texts represent national policy research reports, commissioned research, or policy documents produced by national and local authorities. These knowledge products include studies produced by the so-called institute sector, that is, commissioned research that has to demonstrate policy relevance. In addition, it is also remarkable that two White Papers contain references to 44 academic sources (21 percent), possibly reflecting the strong belief of the Ministry of Education and Research in “scientific evidence” for its political decisions.

4 The scientization of commissions and the political translation by the government

The findings, such as the low co-citation rate among the Green Papers and the highly selective translation process at the ministerial level, have served as clues to create the hypothesis that the changes across time are indicative of distinct changes in the policy process in Norway; the NOUs have increasingly become “scienticized,” with greater weight given to experts than to civil society representatives. As mentioned repeatedly, the lack of shared knowledge among the commissions opens up the space for the government to make political decision with recourse to evidence selectively adopted from the commissioned reports. By way of including relevant literature and additional findings from the study, this particular hypothesis will be explored in further detail in the following.

4.1 The structural coupling between politics and science

A much-discussed phenomenon in sociological systems theory (developed by Niklas Luhmann) is structural coupling between two function systems. In an attempt to refine his theory but also to make his reading better understood, Luhmann applied his interpretive framework to several function systems of society (Luhmann 1990, 1995). His elaboration on the system of education ranked among his very last writings (Luhmann 2002). In the summary (Luhmann 2002, 13-15), he lists key features of systems, of which the following are relevant for this particular article: operative closure, communication, functional differentiation, self-referentiality, and production of meaning. By definition, a system is a closed social entity that constantly enforces and reproduces its boundaries towards other systems. For a system (e.g., the system of politics), other systems (e.g., the system of

science) constitute environment. In a constant movement between inclusion and exclusion, a system solidifies its identity by means of boundary setting, that is, it distances and thereby distinguishes itself from other systems. Despite their structural coupling both systems operate autonomously and preserve their own logic as well as their own code. For sociological systems-theory, scientific advice for policy making is an interesting phenomenon worth examining in greater detail because it bridges or couples two function systems: the system of science and the system of politics (see Weingart 2003).

Similarly, the coupling between the two function systems of politics and science has become a perennial theme in policy studies. Authors in this research field have introduced compelling new terminologies to capture the trend toward knowledge-based regulation or evidence-based governance. Scholars have astutely pointed out that this type of structural coupling, often framed as a democratization of expertise, has led in practice to a (pseudo) rationalization or scientification of political decisions (Maasen and Weingart 2005), is driven by, and at the same time exacerbated by, a governing by numbers (Grek 2008; Ozga 2009) and a steering at a distance (Rose and Miller 1992). The *façade* of rationality and “the selective use of data” (Morris 2012, 89) has been thoroughly dismantled in policy studies and includes critics who shed doubts on whether governance by numbers is less political or more rationale than other modes of regulation. Finally, a few scholars examined the impact that this particular type of structural coupling has had on the relation between different levels of bureaucracies within a state. Most recently, Piattoeva et al. (2018) convincingly argued that the governments of Brazil, China, and Russia (the objects of their study) resort to “governance by data circulation” in an effort to reach out to district authorities. Apparently, externalization to “scientific rationality” helps to temporarily build coalitions across interest groups, even when the consensus may be manufactured and built on an illusory consensus (Verger et al. 2018).

While this group of scholars focuses on the impact of structural coupling on governance, another group investigates the transformation of research as a result of the politicization of science. By now, there exist quite a few important studies that document the political dimension of evidence-based research in policy studies and, even more visibly, in “what works” studies (Cowen 2018; McDonnell and Weatherford 2013). Skeptics scrutinize evaluations of charter schools, vouchers, university ranking, and other controversial reforms to demonstrate that such studies are agenda driven, in that researchers often “spin” their interpretation to please the architects and financiers of the reforms (Gewirtz, Dickson, and Power 2007; Henig 2008). Contrary to the claims of its advocates, evidence-based policy planning needs to be regarded as deeply political. In fact, critics assert that it helps to camouflage political manipulation because it operates under the guise of scientific rationality. To be fair, the criticism of agenda-driven research applies to all funded research. It is hardly new that funding steers research agendas. For this very reason, grant programs of governments, such as the EU Framework Programs (Zapp, Marques, and Powell 2018), but also private foundations, fund research in order to transform schools, research, and society at large in line with their visions (Au and Lubienski 2016; Goldie et al. 2014).

Even though evidence-based policy planning has been critically examined by many (e.g., Henig 2008), the focus is very much on educational researchers who carry out commissioned work for the government and therefore are suspected of manufacturing evidence in line with political mandates. In contrast, how government officials use scientific evidence is under-explored. There are comparatively fewer studies that analyze the reciprocity in the two function systems of science and

politics. Exceptions only confirm the rule. Systems theorists, such as Niels A. Andersen (2010, 2013) or Maasen and Weingart (2005), have made it their intellectual project to examine structural coupling as well as the communication within and between function systems. Andersen (2010, 2013) applied the theory to examine public-private collaboration. He provides a succinct analysis of how private companies have become an integral part of the political system because they are contracted to implement public services. Vice-versa, as part of the boundary work between the two systems, the public or political sector has taken on private sector modes of operation (Andersen 2000, 2013), which Ball and Youdell label “endemic privatization” (2008). Weingart (2003), in turn, shed light on the politics and science nexus. He argued that a recursive coupling of science and politics—scientization of politics and the politicization of science—has resulted in the legitimacy crisis of scientific knowledge. In response to the crisis, politicians and scientists have deployed two different strategies to address the inflation of scientific expertise: contraction and expansion. The contraction approach includes the “hierarchization of expertise” and an artificial scarcity of expertise (57). By limiting what knowledge is included in the policy process, contraction controls the “delegitimizing effects of contradictory statements made by scientific experts” (81). The expansion approach, by contrast, involves an exaggeration of its own power to define political problems in order to gain attention.

The gap in research is understandable given that scholars tend to study the impact of the politics and science nexus either on governance or research, but rarely on both.

4.2 The expertisation of commissions

Government-appointed commissions lend themselves to an investigation of structural coupling between science and politics. They serve as ad-hoc advisory bodies that are expected to draw on expert knowledge, yet are appointed by the government. Unsurprisingly, political scientists have drawn their attention to such hybrid bodies that occupy the space between science and politics. Boswell (2018), Littoz-Monnet (2017), and Sending (2015) have dissected the politics of expertise in international bureaucracies.

A key challenge for both international as well as national authorities is to appoint members for ad-hoc commissions that fulfill three kinds of tasks: expertise, accountability, and representation. Governments need to rely on experts with insider knowledge who are sufficiently familiar with the bureaucracy to provide useful and realistic advice regarding complex matters. In addition, independent experts—preferably academics working outside of the bureaucracy—are needed to serve on commissions. These independent experts are authorized to observe and evaluate past reforms and, by implication, hold the administration accountable for its technocratic performance. Finally, governments need to satisfy demands in their political environment for participation and representation in government decisions (e.g., Boswell 2017). Government appointed ad-hoc commissions such as the NOUs fulfill this tripartite composition (discussed in the political science literature). They include government officials or inside experts, academics or external experts, and representation from interest groups. One may argue that the composition of the commissions is as important, or perhaps even more important, for the political credibility of a government than the actual recommendations and reports that they produce. An analysis of the composition of such commissions is therefore instrumental for identifying changes in the policy process.

As David Arter (2008) pointed out in his comparative study of the “Nordic model of government,” policy-preparing commissions that produce Green Papers are considered a vital part of the political decision-making process in Scandinavia. In fascinating studies of Nordic decision-making systems and ad-hoc-commissions, Christensen and Holst (2017) and Christensen and Hesstvedt (2018) examine the transformation of NOUs over the past fifty years or so. Christensen and Hesstvedt (2018) analyzed 1,530 reports that were produced by the 13,590 members of such ad-hoc-commissions over the period 1972–2016. They compared the NOUs of the sixteen core ministries in Norway (education, health and social services, justice, etc.) and examined their composition over time. They classified the members by affiliation and profession, notably, civil and public servants, academics, interest groups, private sector, legal professions (judges and lawyers), politicians, and others. In the Norwegian commission, the three largest groups are the three groups mentioned above: civil and public servants (government officials), academics, and interest groups.

The work of Christensen and Holst (2017) is also relevant for our study because the authors focus on the institutional affiliation of the chairpersons and the secretariats of these commissions. Chairpersons have an important role because they set the direction of the work of the commission and its secretariat. It is also the chairperson who speaks with the government and the public on behalf of the commission. In the same vein, the role of the secretariat cannot be underestimated. The members of the secretariat carry out the actual work of the commission and are often charged with collecting data and drafting reports. Unsurprisingly, the secretariats have grown larger over the past fifty years. In the 1970s, the secretariats consisted in most cases of one person, whereas the commissions after 2000 had six secretaries or more (Christensen and Holst 2017).

These two studies provide important clues that explain the highly specialized knowledge, with little cross-referencing or co-citations that we encountered in the network structures of the 2006 and 2020 reforms. First, the interest group representatives in the Official National Commissions dropped sharply, by more than half, over the past four decades. During the same time span, the share of academics on ad-hoc-commissions surged dramatically. In the 1970s, the academics only accounted for seven percent of commission members. In the first decade of the new millennium, their share raised to 26 percent. In fact, in the most recent period of their study (2007–2011), they surpassed the civil servants and now constitute the majority of NOU members. Second, the share of interest groups varies considerably among the policy domains. In the Ministry of Labor, they account for 42.3 percent of the NOU members, whereas in the Ministry of Justice, NOU their share shrinks to 9.5 percent. Strikingly, the Ministry of Education and Research NOUs have, after the Ministry of Justice, the second-lowest share of interest groups (7.9 percent). More than any other commissions, the education NOU, appointed by the Ministry of Education and Research, have the highest representation of academics serving in the commissions. The three largest groups serving in education ad-hoc commissions are civil servants (32.7 percent), followed by academics (18.2 percent), and interest groups (7.9 percent).⁷ The linear increase of academics over the period 1972–2009 and with an explosive growth from 2010–2016 has led Christensen and Hesstvedt (2018, 2374) to analyze the causes of the “expertisation” in NOUs in greater detail.

⁷ There is a large proportion of missing data and unclassified members (“others”) in the study of Christensen and Hesstvedt (2018), in particular for the NOUs of the Ministry of Education and Research. Nevertheless, the proportion of government officials, academics, and interest groups—listed here in the order of frequency—still holds even though the exact proportions may need to be the subject of further analysis.

A breakdown by the chairpersons and secretariats portrays a similar picture. As Christensen and Holst (2017) assert, academics have replaced civil servants as chairpersons in the majority of commissions, starting at the turn of the new millennium. In other words, academics have become the public face of the commissions, representing the work of the NOUs vis-à-vis the general public. Internally, however, it is not academics, but rather the civil servants, who do the actual work in the secretariats. Over a period of more than 40 years, academics accounted for only a handful of secretaries. The secretaries are nearly exclusively recruited from ministries, with the Ministry of Finance taking the lead in staffing secretaries across policy domains.

In concert with our findings, Christensen and Holst (2017) noticed an increase of references to international documents, notably to international academic research, as well as a change in the style of references.⁸ They concluded:

The growth in the total volume of citations in commission reports and in the number of citations to international academic literature suggests both a more academic style and increasing reliance on scientific knowledge in commission work. (Christensen and Holst 2017, 829).

What are we to make of the clear trend toward expertization in the commissions and toward a dwindling involvement of interest groups? Christensen and Holst (2017) provide a differentiated response, which takes into account various political viewpoints:

For participatory democrats our findings indicate less inclusion, and so less democracy. Aggregative democrats will be critical of how greater academic participation reduces preference representativeness. If political equality is the ultimate standard, more political power to academics and bureaucrats is *prima facie* worrisome, and in need of justification [...] For elite democrats the rise of commission elites as such is perfectly legitimate and even recommendable; the decisive question is whether more academics make policy-making elites better. As for deliberative and epistemic democrats, we could expect them to welcome this trend, inasmuch as academics stick to their prescribed role of bringing validated knowledge to the table and the increased use of references indicates a more deliberative commission culture. (830).

4.3 Simplification and elaboration: The political uses of international comparison

The 2006 reform was established in the aftermath of the unexpected, negative PISA 2000 results. In an attempt to “study up,” we therefore reviewed references to OECD in the two relevant White Papers of the 2006 reform. As presented in Table 3, the two White Papers make reference to 18 different OECD publications. Furthermore, a cursory content analysis of the two White Papers reveals that “OECD” appears more than just once when the reference is made. In fact, the two White Papers cite OECD 28 times in the 120-page document of White Paper 58 and 79 times in the 105-page document of White Paper 2140. OECD’s education policies on competency-based curriculum reform and test-based accountability have been influential to the extent that the Green Paper “In the First

⁸ The figures are not directly comparable, because we counted the references per document, whereas Christensen and Holst (2017) computed the frequency of referenced texts by 100 pages.

Row” may be viewed, as mentioned above, an indigenized or nationally adopted version of the OECD DeSeCo framework.

There are several important studies that investigate how international bureaucracies, including OECD, establish authority in the absence of coercive power. Scholars in political science, notably at the University of Bremen (Martens and Jacobi 2010) and at the Graduate Institute of International and Development Studies in Geneva (Littoz-Monnet 2017) have greatly advanced research on the mechanisms of OECD governance and the technologies of authorization. For the Scandinavian context, the comparative education study by Daniel Pettersson, Tine Sophie Prøitz and Eva Forstberg (2017) deserves special mention. They examine how OECD presents its policy recommendations to policy actors in Norway and Sweden. Their content analysis of five OECD reviews convincingly shows how the authors of the reports blend international OECD rhetoric with themes that are considered relevant in the two national reform contexts of Norway and Sweden. This group of authors elaborates on how OECD establishes authority.

Another strand of research draws attention to the opposite side: why, how, and when governments institutionalize international recommendations in their national contexts. Among others, they investigate the reasons why OECD studies are attractive for government officials. Wendy Espeland (2015) and Radhika Gorur (2015), for example, masterfully observe the advantages of numbers over complex narratives because one may attach one’s own narratives to numbers. What is especially appealing to policy actors are OECD-type studies, that is, statistics, scores, ranking, and benchmarks that are based on international comparison or on comparison over time.

Espeland (2015, 56) explains the dual process of *simplification* and *elaboration* involved in the usage of numbers. In a first step, numbers “erase narratives” by systematically removing the persons, institutions, or systems being evaluated by the indicator and the researcher doing the evaluation. This technology of simplification stimulates narratives, or as Espeland astutely observes:

If the main job of indicators is to classify, reduce, simplify, to make visible certain kinds of knowledge, indicators are also generative in ways we sometimes ignore: the evoke narratives, stories about what the indicators mean, what are their virtues or limitations, who should use them to what effect, their promises and their failings. (65)

Scholars in comparative policy studies have started to explore why PISA and other international large-scale student assessments are so attractive to policy actors and politicians (Addey et al. 2017; Pizmony-Levy 2018). A few studies focused on the “narrative evoking” phase (Espeland 2015, 65) of such studies and dissected what national governments interpret or project onto OECD reports or other international comparative studies based on their own policy context and agenda (Steiner-Khamsi, and Waldow 2018).

A follow-up content analysis is needed to fully understand which aspects of the 18 OECD publications cited in the two White Papers were so attractive to the authors of the two White Papers, and how they used the reference.

5 Conclusions

Let's circle back to the introductory section in which the bureaucracy was depicted in a commonsense manner as a pyramid structure with the ministry at the top, the people at the base, and its appointed commissions somewhere in the middle. As expected, the picture is more colorful in actual reality. The assumption that governments are passive recipients of scientific advice provided by their appointed ad-hoc commissions prior to taking or legitimizing a political decision is clearly outdated. After all, the "democratization of expertise" has taken place in a ubiquitous manner (Maasen and Weingart 2005). Not only do users, laypersons, and non-state actors (professional organizations, interest groups, private sector, etc.) nowadays engage in knowledge production, the government itself reads, cites, and disseminates its own knowledge.

An early indication of changes in knowledge production and sharing are the open-access policies that both governments and research councils have put in place in recent years. Peter Weingart and Justus Lentsch (2008) consider such open-access policies to be part and parcel of the democratization of expertise. The relationship between science and politics has, according to Weingart and Lentsch, experienced three distinct shifts over the past seventy years (2008, 207 ff.). During the early period of scientific policy advice (1950s to 1970s), the ad-hoc expert commissions insisted on being autonomous and independent from government. As a corollary, their reports amassed foundational scientific knowledge that policy actors could or could not use, respectively. In a second phase, the commissions became increasingly politicized (1970s to 1990s) because they were charged with the task of producing policy-relevant scientific knowledge. In the current, third phase, governments in many countries have experienced a shift from "knowledge-based legitimacy" to "participation-based legitimacy." This also applies to government-appointed ad-hoc experts commissions. Governments are under pressure to "democratize" scientific policy advice by (i) providing open access to reviews and expertise, (ii) expanding the definition of "experts," and (iii) insisting that the knowledge products are useful, that is, provide a clear foundation for stop/go policy decisions.

Scholars also have noted that the shift has taken place between "mode 1" and "mode 2" knowledge production. "Mode 1" represents foundational research that is primarily concerned with advancing scientific discovery and disciplines. In contrast, "mode 2" is application-oriented, transdisciplinary, local and involved experts outside of purely academic settings (Gibbons et al. 1994; Nowotny, Scott, and Gibbons 2003). With the shift toward "mode 2" knowledge production, open access to knowledge products, transparent expert selection criteria, and understandability of scientific research findings have become the norm and not the exception.

The structural coupling of science and politics accounts for a new type of research—research that must be applied, policy relevant, and if possible multi-disciplinary. This so-called "mode 2"-type of knowledge (Nowotny et al. 2003) is produced both by academics in universities *and* policy analysts in government organizations. In many countries, including in Norway, this type of research is actively promoted. The so-called institute sector such as for example, by the Nordic Institute for Studies in Innovation, Research and Education (NIFU, for a period also called NIFU STEP), have become significant knowledge producers in the education sector. Commissioned (policy) research in the form of the institute sector is likely to expand in the near future. According to the Norwegian Research Council, the overall objective of the institute sector is as follows:

Deliver high-quality, applied research results of relevance to trade and industry, the public administration and society at large in the market for commissioned research. The Institute

Sector is also responsible for knowledge development in national priority areas and for fostering innovation, particularly with a view to linking basic and applied research. (Norwegian Research Council, 2017)

Different from the two important studies (Christensen and Holst 2017; Christensen and Hesstved 2018) summarized earlier, which exclusively focused on the composition and reference patterns of the commissions, our study traced which evidence from the expert commission reports the Ministry of Education and Research actually *used*. How the work of commissions is translated into political decisions is essential for understanding whether academics really exert that much influence in policy formulation as their participation in commission, at the stage of policy preparation, would have us believe.

The “democratization of expertise” (Maasen and Weingart 2005) and the “over-production of evidence” (Lubienski 2019) have transformed the role of government-appointed commissions. In the case of the 2006 school reform, the Ministry of Education and Research primarily used its commission to draw on their highly specialized knowledge on particular topics. For justifying broader political decisions, however, the Ministry of Education produced its own “evidence” and drew on its own knowledge depository.

As shown in this bibliometrical study, the Ministry of Education and Research used less than ten percent of knowledge presented in its commissions to justify the 2006 reform (see Figure 2). This means that around 90 percent of texts amassed by expert commissions in order to provide evidence-based policy advice to the government is ignored. This finding is surprising given NOUs mandate to provide scientific policy advice to the government. It would be inaccurate, however, to conclude that the NOUs “do their job” (reflected in the large number of references incorporated into the Green Papers) but that the Ministry of Education and Research simply “does not listen” (more than ninety percent of references are ignored or lost in the political translation process). It is more accurate to state that the Ministry of Education and Research interjects its own sources of information when justifying a reform. Our analysis of the Ministry’s own knowledge production reveals that the majority of references, made in its White Papers, are either government or government-commissioned texts (58.2 percent), academic research (23.3 percent), as well as references to publications of international organizations, notably OECD (see Table 3). Apparently, the expert commissions and the government read and reference vastly different texts. This is an unexpected finding given the large apparatus of NOUs and their core mandate of providing evidence-based policy advice. Providing evidence (Green Papers) is different from acknowledging texts as authoritative texts or evidence (White Papers). The Green Papers indeed provide ample evidence for their review and recommendations. But the only references of the commissioned reports, which the White Papers catapulted to authoritative status, are the ones related to OECD. In fact, 20 of the 22 shared references between Green and White Papers are from the commissioned report “In the first row...” (NOU 2003) which represents a national adaptation of OECD’s DeSeCo project.

Several scholars suggest that we collapse the two systems of science and politics, because they have become inextricably linked. Science is not neutral, and politics is not merely representational. Furthermore, power is reflected both in politics as well as in (discursive) knowledge. For them, the politicization of science and the scientization of politics are not new phenomena which could be

attributed the rise of knowledge-based regulation. After all, statistics—literally the science of the state—was a 18th century political enterprise (Foucault 1991, 96) that enabled the modern nation state to differentiate between citizens and non-citizens. Similarly, Louis Pasteur’s discovery of microbes was only made possible by reframing an individual disease into a social problem, administered by the state. Bruno Latour’s analysis of the Pasteurization of France demonstrates masterfully how science and politics became intertwined in 19th century France: “Science is not politics. It is politics by other means” (Latour 1984, 229; see Brown 2009, chapter 8; Gorur, Hamilton, Lundahl, and Sundström Sjödin 2019).

In actual policy practice, however, the two systems, fields, or domains are not collapsed. The Government of Norway is not alone with differentiating between the scientific process of reviewing and recommending policies (Green Papers) and the political process of making policy decisions (White Papers). This kind of ad-hoc commissions that provide scientific advice for policy makers is quite common (Weingart and Lensch 2008). In this study, we critically examined the differentiation between science and politics and were indeed surprised to find little correspondence between expert knowledge and political knowledge. In other words, the differentiation was significant to the extent that it mattered little what scientific evidence the expert commissions had produced for the government. The Ministry of Education and Research used its own knowledge sources. In fact, the only body of knowledge with authoritative status, which was cited both by the Green and the White Papers, was OECD’s DeSeCo project (20 out of 22 shared references).

The bibliometrical network analysis clearly demonstrates changes in the reference pattern between the two reform periods. Among others, the explosive growth of references both in Green and White Papers is noteworthy. Today more than in the earlier reform period, the expert commissions as well as the Ministry of Education and Research find it necessary to substantiate their statements, reviews, or decisions with reference to other texts. There is clearly a hierarchy of evidence visible in the type of references made in the Green and White Papers. For the White Papers, OECD reports as well as references listed in OECD reports are on the top of the hierarchy. What counts as evidence differs vastly between Green and White Papers even though science and politics are typically considered to be closely intertwined. It is therefore necessary to investigate not only what expert commissions produce in terms of policy evidence, but also which evidence governments actually *use* when they formulate the policy.

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Appendix 1. List of White Papers and Green Papers by Reform Period

2006 Reform

- 2 White Papers (WPs)
 - WP 58: St.meld. nr. 30 (2003-2004): Kultur for læring [Culture for learning]
 - WP 2140: St.meld. nr. 16 (2006-2007): ... og ingen sto igjen. Tidlig innsats for livslang læring [..No one left behind. Early intervention for lifelong learning]
- 5 Green Papers (GPs)
 - GP 36: NOU 1999: 33 Nyttige lærepenger — om utdanningsfinansieringen gjennom Lånekassen [Useful study funding—Study funding through the state educational loan fund]
 - GP 57: NOU 2003: 16 I første rekke — Forsterket kvalitet i en grunnsopplæring for alle [In the first row— Increased quality within a basic education system for everyone]
 - GP 59: NOU 2002: 10 Førsteklasses fra første klasse — Forslag til rammeverk for et nasjonalt kvalitetsvurderingssystem av norsk grunnsopplæring [First class from first grade. Proposition for a framework for a national quality assessment system]
 - GP 2646: NOU 1992: 17 Rammeplan for barnehagen [Guidelines for kindergarten]
 - GP 5596: NOU 2004: 5 Arbeidslivslovutvalget — Et arbeidsliv for trygghet, inkludering og vekst [The commission for employment regulations. A work life for security, inclusion and growth]

2020 Reform

- 2 White Papers (WPs)
 - WP 40: Stortingsmelding 21 (2016-2017): Lærelyst - tidlig innsats og kvalitet i skolen [Eager to learn. About early intervention and quality in schools]
 - WP 56: Meld. St. 28 (2015–2016) Fag - Fordypning - Forståelse - En fornyelse av Kunnskapsløftet [Subjects – In-depth learning – Understanding. Renewal of the Norwegian Knowledge Promotion Reform]
- 12 Green papers (GPs)
 - GP 41: NOU 2011:14 Bedre integrering – Mål, strategier, tiltak [Better integration – Goals, strategies and measures]
 - GP 42: NOU 2012:1 Til barnas beste. Ny lovgivning for barnehagene [For the best of the children. New legal regulation of the kindergarten].
 - GP 50: NOU 2016:14 Mer å hente - Bedre læring for elever med stort læringspotensiale [More to gain – Better learning for students with higher learning potential]
 - GP 51: NOU 2015: 8. Fremtidens skole: fornyelse av fag og kompetanser [The school of the future. Renewal of subjects and competences]
 - GP 53: NOU 2010:7 Mangfold og mestring. Flerspråklige barn, unge og voksne i opplæringssystemet [Diversity and mastering. Multilingual children, young people and adults in the education system]
 - GP 54: NOU 2009:18 Rett til læring [students' rights to learning]
 - GP 55: NOU 2007: 6. Formål for framtida: formål for barnehagen og opplæringen [Objects clause for kindergarten and primary and secondary education]
 - GP 57: NOU 2003: 16. I første rekke: forsterket kvalitet i en grunnsopplæring for alle. [In the first row—Increased quality within a basic education system for everyone]
 - GP 60: NOU 2014: 7. Elevenes læring i fremtidens skole: et kunnskapsgrunnlag [Pupils' learning in the school of the future. A knowledge base].
 - GP 91: NOU 2015: 13. Digital sårbarhet – sikkert samfunn — Beskytte enkeltmennesker og samfunn i en digitalisert verden [Digital vulnerabilities in society]
 - GP 92: NOU 2015: 2. Å høre til: virkemidler for et trygt psykososialt skolemiljø [About belonging and a safe psycho-social school environment].

- GP 93: NOU 1999: 18. Organisering av oppdragsvirksomhet: en vurdering av rammene for oppdragsvirksomhet ved institusjoner innenfor høgre utdanning [The structure of assignment activities: An evaluation of the conditions for assignment activities within higher education].