Governance processes in the nuclear safety sector

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How organizational history and organizational structures matter

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Summary

The world is increasingly faced with complex border-crossing problems that are difficult to solve and often entail long-term consequences. Such 'wicked problems' are seldom addressed by a single actor. Instead, these problems frequently require cooperation between different actors at different levels. This thesis examines governance processes in the nuclear safety sector, and its theoretical point of departure is the explanatory power of organizational history and organizational structures. The aim of this thesis is to illuminate how these two factors influence governance processes in a sector faced with wicked problems. This thesis situates itself within new institutionalism which emphasizes the importance of historical contexts and internal organizational factors in understanding governance processes. Moreover, this perspective also highlights the key role of formal organizations in administrative and political life.

This thesis primarily investigates public administration and public organizations situated at different levels within the nuclear safety sector. Moreover, all the articles highlight how different actors work together to develop standards, regulations, and laws with major consequences for practices at the national level. In so doing, this thesis illuminates different governance processes at the national, regional, and global levels within the nuclear safety sector:

I. The first article investigates endogenous governance dynamics within the Norwegian Radiation and Nuclear Safety Authority (DSA). Three models are developed to conceptualize the dynamics within the agency: a governmental model, a supranational model, and a transnational model. The findings show that the DSA is internally torn between governmental and transnational dynamics. However, agency personnel across the agency strongly emphasize their role as experts; hence, transnational dynamics are prevalent throughout the agency. The findings suggest that endogenous organizational characteristics are essential determinants in balancing these dynamics within the DSA.

II. The second article explores the relationship between the Nordic authorities on radiation and nuclear safety by investigating how integrated these authorities are into each other. The findings indicate that the relationship is characterized by differentiated integration. To explain this finding, the article highlights the importance of path dependency and portfolios.

III. The third article examines cooperation between three international organizations at the global level: the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), and the International Atomic Energy Agency (IAEA). The findings indicate that the relationship between UNSCEAR and the ICRP is more prone to tensions than the relationships involving the IAEA, even though UNSCEAR and the ICRP have a longstanding history of cooperation. The article

highlights in particular the importance of organizational birthmarks in explaining the findings.

By showing how historical–institutional contexts and endogenous organizational factors contribute to explaining variations in governance processes, this thesis makes a general contribution to new institutionalism and the Scandinavian new institutional approach. More specifically, the main theoretical contributions of this thesis are demonstrated in how the findings corroborate the importance of established theoretical perspectives related to historical institutionalism, organizational birthmarks, and organization theory. Empirically, this thesis contributes by mapping and unpacking important organizations and actors in the nuclear safety sector and by conceptualizing governance processes at different levels. Methodologically, the study is based on qualitative data gathered primarily through semi-structured interviews that were supplemented by document analysis. This thesis is divided into two main parts: part one comprises the five sections of the synopsis, while part two contains the three individual articles of the project.

Summary in Norwegian

Verden står i økende grad overfor komplekse, grenseoverskridende utfordringer. Slike utfordringer er vanskelige å løse, de har ofte langvarige konsekvenser og de blir sjeldent adressert av én enkeltstående aktør. I stedet krever slike utfordringer som regel samarbeid mellom ulike aktører på ulike nivåer. Denne avhandlingen studerer styrings- og koordineringsprosesser innen atomsikkerhetssektoren, og det teoretiske utgangspunkter er hvordan organisasjonshistorie og organisasjonsstrukturer kan bidra til å forklare variasjon i slike prosesser. Målet med denne avhandlingen er dermed å belyse hvordan disse to faktorene påvirker styrings og koordineringsprosesser i en sektor som står overfor komplekse, grenseoverskridende utfordringer. Avhandlingens teoretiske rammeverk er knyttet til nyinstitusjonalismen, og denne retningen fremhever blant annet den sentrale rollen formelle organisasjoner har i det administrative og politiske liv. Videre understreker nyinstitusjonalismen viktigheten av nettopp historiske kontekster og interne organisatoriske faktorer for å forstå ulike styrings- og koordineringsprosesser.

Denne avhandlingen studerer primært offentlige organisasjoner på både nasjonalt, regionalt og globalt nivå innen atomsikkerhetssektoren. Videre fremhever alle artiklene hvordan ulike aktører jobber sammen for å utvikle standarder, forskrifter og lover med store konsekvenser for praksis på nasjonalt nivå:

I. Den første artikkelen studerer styrings- og koordineringsdynamikker innad Direktoratet for strålevern og atomsikkerhet (DSA). Tre modeller er utviklet for å konseptualisere ulike dynamikker: en nasjonal modell, en overnasjonal modell og en transnasjonal modell. Funnene viser at DSA rives mellom nasjonale og transnasjonale dynamikker. Ansatte på tvers av avdelinger og seksjoner understreker imidlertid sin rolle som eksperter, og transnasjonale dynamikker gjennomsyrer dermed hele direktoratet. Funnene tyder på at interne organisatoriske faktorer er avgjørende for å balansere disse dynamikkene i DSA.

II. Den andre artikkelen studerer forholdet mellom de nordiske myndighetene innen strålevern og atomsikkerhet ved å undersøke hvor integrert disse myndighetene er inn i hverandre. Funnene tyder på at forholdet mellom dem er preget av differensiert integrasjon. For å forklare dette funnet fremhever artikkelen viktigheten av stiavhengighet og porteføljer.

III. Den tredje artikkelen studerer samarbeid mellom tre internasjonale organisasjoner som opererer på det globale nivået: FNs vitenskapelige komité for effekter av nukleær stråling (UNSCEAR), Den internasjonale kommisjonen for strålevern (ICRP) og Det internasjonale atomenergibyrået (IAEA). Funnene tyder på at det er flere spenninger i forholdet mellom UNSCEAR og ICRP, sammenlignet med relasjonene som involverer IAEA. Dette til tross for at UNSCEAR og ICRP har samarbeidet tett over mange år. Artikkelen belyser særlig betydningen av

organisasjonshistorie via organisatoriske «fødselsmerker» for å forklare funnene.

Ved å vise hvordan historisk-institusjonelle kontekster og interne organisatoriske faktorer bidrar til å forklare variasjon i styrings- og koordineringsprosesser, gir denne avhandlingen et generelt bidrag til nyinstitusjonalismen og den Skandinaviske nyinstitusjonelle tilnærmingen. Nærmere bestemt er denne avhandlingens viktigste teoretiske bidrag knyttet til hvordan funnene bekrefter og underbygger betydningen av etablerte teoretiske perspektiver knyttet til historisk institusjonalisme, organisatoriske fødselsmerker og organisasjonsteori. Denne avhandlingen bidrar empirisk ved å kartlegge og pakke ut viktige organisasjoner og aktører i atomsikkerhetssektoren og ved å konseptualisere styring og koordinering på ulike nivåer. Metodisk er studien basert på kvalitative data samlet primært gjennom semistrukturerte intervjuer, supplert med dokumentanalyse. Denne avhandlingen er delt inn i to hoveddeler: del én består av kappa i fem deler, mens del to består av de tre enkeltstående artiklene i prosjektet.

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List of abbreviations

DSA	Norwegian Radiation and Nuclear Safety Authority
EU	European Union
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
IGO	Inter-governmental organizations
IO	International organizations
IPA	International public administration
IR	International relations
MLA	Multilevel administration
NGO	Non-governmental organizations
NSD	Norwegian Centre for Research Data
PA	Public administration
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation

List of articles

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List of appendices

Part one: The synopsis

1 Introduction

The modern awareness of ionizing radiation began in the late 1800s with the discovery of X-rays and radioactive uranium. Already in his Nobel Prize lecture of 1903, Pierre Curie discussed the harmful effects of using radiation in medicine and questioned whether mankind would benefit from knowing "the secrets of nature", especially those related to the potential use of radiation in war (Reed 2011). Over 100 years later, we know that these discoveries indicated the beginning of a long history leading to both the widespread use of radiation in medicine, the development of nuclear reactors, and the detonation of atomic bombs, and in the twentieth century, the world witnessed both the great beneficial applications of this technology and its potential for bringing about disastrous consequences. The world is still faced with the conundrums created by our knowledge of these secrets of nature, and actors at different levels are striving to find ways to use nuclear technologies in ways that not only benefit people, but also protect them and the environment across the globe from the harmful effects of radiation.[1]

The challenges posed by nuclear science and technology are inherently complex and can be labelled as 'wicked problems' (Rittle & Webber 1973). In general, the notion of wicked problems is commonly used to categorize some of the major global issues facing the world today, such as climate change, poverty, and societal safety and security, which are assumed to have highly negative consequences for society if they are not addressed properly (Christensen & Lægreid 2018: 1088; Peters 2017). The 'wickedness' of wicked problems is related to their social and political complexity and the unavoidable involvement of multiple actors (Head 2019: Peters 2017). The concept of wicked problems was first coined by Rittle and Webber (1973) in their influential paper "Dilemmas in a General Theory of Planning", and they list several features to explain wicked problems: they are hard to define, they can be considered symptoms of other problems, and they can be explained in numerous ways. A core feature of wicked problems is that, for several reasons, they are resistant to solutions: there is no 'true' or 'false', but rather 'good or bad', 'better or worse', or 'satisfactory' (Head 2019; Rittle & Webber 1973; Turnbull & Hoppe 2019), and yet every attempt to solve them counts significantly. Scholars have also introduced the concept of 'super-wicked' problems, recognized as inherently long term and also potentially large scale (Peters 2017). The main challenge posed by such problems is thus how to reorient institutions and policies to respond to long-term collective interests (Levin et al. 2012).

Issues related to nuclear science and technology share several characteristics with wicked and super-wicked problems. First, issues related to nuclear science and technology are complex, and multiple actors are needed to address such issues.

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[1] See for instance the mission statement of the IAEA: https://www.iaea.org/about/mission

Second, questions raised by our knowledge of nuclear science and technology are resistant to solutions because there are mainly 'good or bad', 'better or worse', or 'satisfactory' solutions. Third, our knowledge of nuclear science and technology can have catastrophic consequences for society if not addressed properly. Finally, such issues have long-term implications, and they are border-crossing and potentially large-scale issues.

1.1 Main aim and research questions

The main aim of this thesis is to illuminate how organizational history and organizational structures influence governance processes in a sector faced with wicked problems. Consequently, this thesis unpacks organizations and assumes that inherent organizational characteristics can bias governance processes by making some choices more likely than others (Egeberg & Trondal 2018; Lægreid 2020: 423). The laboratory is the nuclear safety sector, and this thesis primarily examines public administration and public organizations situated at different levels within this sector. All the articles show how different actors work together to develop standards, regulations, and laws with vast consequences for practices at the national level. In so doing, this thesis highlights different governance processes at both the national (Article 1), regional (Article 2) and global (Article 3) levels within the nuclear safety sector. This thesis situates itself within new institutionalism. This perspective suggests the importance of historical contexts and internal organizational factors in understanding governance processes and highlights the key role of formal organizations in administrative and political life. Consequently, the basic assumption of this thesis is that history and organization matter. Based on this overarching aim, the outline and research questions of the three articles of this thesis are as follows:

Article 1: "Dynamics of agency governance. Evidence from the Norwegian Radiation and Nuclear Safety Authority"

Article 1 asks the following question: What are the internal agency dynamics of the Norwegian Radiation and Nuclear Safety Authority (DSA), and what may account for variation in how these dynamics are balanced within the agency? The paper investigates governance processes within a single organization, namely the DSA, and develops three models to conceptualize the dynamics within that agency: a governmental model, a supranational model, and a transnational model. The findings show that the DSA is internally torn between governmental and transnational dynamics. However, agency personnel across the agency strongly emphasize their role as experts; hence, transnational dynamics are prevalent throughout the agency. The study suggests that endogenous organizational characteristics are essential determinants in balancing these dynamics within the DSA.

Article 2: "Nordic cooperation in the nuclear safety sector: High, low, or differentiated integration?"

Article 2 asks the following question: Why does the degree of integration vary between issues of safety, security, and safeguards, involving the same actors, in the same sector, at the same level? The article explores the relationship between the Nordic authorities on radiation and nuclear safety, and the degree of integration is operationalized by four different coordination mechanisms. The findings indicate that the relationship is characterized by differentiated integration, and the data suggest the importance of path dependency and portfolios to account for variation.

Article 3: "Global governance and inter-organizational relationships in the nuclear safety sector"

Article 3 asks the following question: What shapes cooperation and conflict between organizations at the global level, and why do conflicts arise between organizations with a longstanding history of cooperation? The article examines the inter-organizational relationship between the three most important global actors in the nuclear safety sector, namely the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), and the International Atomic Energy Agency (IAEA). In the article, a conceptual model of cooperation and conflict between organizations is developed. The findings indicate that the relationship between UNSCEAR and the ICRP is more prone to tensions than the relationships involving the IAEA, even though UNSCEAR and the ICRP have a longstanding history of cooperation. The article highlights in particular the importance of organizational birthmarks in explaining the findings.

1.2 Defining the nuclear safety sector and 'governance'

From the outset, two central aspects of this thesis need clarification: what is the nuclear safety sector, and how is governance defined in this thesis? First, the nuclear safety sector is divided into three pillars: safety, safeguards, and security (Table 1). Safety is defined as the protection of people, the environment, and society from the consequences of radiation. It includes radiation safety and radiation protection in the medical context, emergency preparedness and nuclear safety, which in general is about how to operate nuclear facilities to avoid accidents. Safeguards ensure that nuclear materials, technologies, and information are used for peaceful purposes and not to develop nuclear weapons. This includes arms control and non-proliferation. Finally, security is linked to both safety and safeguards, and it is mainly about protecting nuclear facilities from terrorism and how to avoid theft of nuclear materials, technologies, and information.

Table 1: The three pillars of the nuclear safety sector

Safety	Safeguards	Security
Radiation protection Emergency preparedness Nuclear safety	Preventing the development of nuclear weapons	The protection of nuclear facilities

Second, the word 'governance' originally relates to steering, piloting, or directing a boat (Bell & Hindmoore 2009; Peters 2012: 20), and generally speaking, governance might refer to both structures (hierarchies, markets, and networks) and processes (steering and coordination) (Pierre & Peters 2020: 1). This thesis, however, understands governance primarily as processes. In this vein, Ansell and Torfing (2016: 4) define governance as "the process of steering society and the economy through collective action and in accordance with common goals". Based on this definition, it is possible to treat governance as a variable encompassing both hierarchical and horizontal processes, and governance should therefore be considered to be mixed and composite with inbuilt tensions (Egeberg et. al 2016: 32; Egeberg & Trondal 2018: 3–4). Moreover, organizations are key actors in governance processes; therefore, such processes cannot be adequately understood or explained without considering the organizational–institutional dimension (Ansell et al. 2017: 9).

1.3 The empirical relevance of this thesis

The aim of this section is to introduce and contextualize the empirical relevance of this thesis and to place it in some relevant streams of literature. The point of departure is how governments and public administration are attempting to manage and address wicked problems. Arguably, governments have proved their ability to solve simple problems based on means–ends rationality and legal rules (Peters 2017). However, in their influential work, Rittle and Webber (1973) critiqued the usefulness of science-based and technical approaches to planning and public policy due to the uncertainty and complexity of wicked problems (Head 2019), and in so doing, they initiated a general criticism of the inability of political actors to solve complex problems (Ansell et al. 2020). In an attempt to address this challenge, Rittle and Webber suggested that wicked problems need to be discussed between a wide range of stakeholders and that an 'argumentative process', wherein the problems are negotiated, is required. Through these processes, a shared understanding of the problem might develop and lead to coherent action (Head 2019). A growing number of scholars have argued that complex problems are best solved through multi-actor collaborations (Ansell et al. 2020). Hence, a wide range of actors need to operate in concert to address wicked problems, and such problems and their related policy areas are therefore likely to be shaped by the power and authority of multiple actors (Karns et al. 2015: 1).

When multiple actors are involved, interconnectedness and coordination between them are highly important, and arguably, the call for better coordination grows

stronger as societies are increasingly faced with complex crosscutting challenges (Molenveld et al. 2020). Hence, a key factor underscoring the need to coordinate is the existence of problems that seldom are solved through the actions of any individual organization, and this is especially apparent in a time characterized by more multilevel, multi-organizational, and fragmented governmental apparatuses (Lægreid & Rykkja, 2015; Peters 2018). However, coordination has proved challenging and is deemed a "fundamental problem for public administration and policy" despite numerous attempts to make organizations work together more successfully (Peters 2018). Coordination is a contested term, but in this thesis, it refers to "the purposeful alignment of tasks and efforts of units or actors to achieve a defined goal" (Lægreid & Rykkja 2015; Verhoest & Bouckaert 2005: 95). Coordination is thus closely linked to how organizations relate to each other, and the interconnectedness between different actors is regarded as the *sine qua non* of responses to challenges with border-spanning characteristics (Biermann & Koops 2017: 13-14; Finnemore 2014; Legrand 2019; Stone & Ladi 2015; Weiss & Wilkinson 2018: 13). Scholars are therefore encouraged to focus on relationships among actors, and they are urged to recognize the interconnectedness of different structures of both a public and private nature (Legrand 2019; Stone & Ladi 2015).

In the international relations (IR) literature, similar ideas are reflected in discussions that challenge traditional state-centric models (Keohane & Nye 1974; Ruggie 1998: 42). Keohane and Nye (1974) were some of the first to draw attention to cross-border transactions and networks, and they took aim at state-centrism by suggesting that within 'world politics', states were only one of the actors in the conduct of 'transnational' relations, involving non-governmental entities, and 'transgovernmental' relations, involving sub-units of states (Raadschelders & Verheijen 2019: 42; Ruggie 1998: 42). Some scholars describe these political structures as 'patchwork' where interdependence, blurred boundaries, and entanglement are fundamental, and the argument is that in our modern world it is increasingly difficult to separate what takes place within national boundaries and what takes place across and beyond nations (Djelic & Sahlin-Andersson 2006: 4). Hence, scholars argue that we are experiencing a re-ordering of the world (e.g., Slaughter 2004), where the political world is governed through a complex global web consisting of interactions between a wide range of different actors. Some describe this global web as 'transnational governance', understood as the variety of different types of actors and different sorts of connections across multiple numbers of national boundaries (Seabrooke & Henriksen 2017: 3). Consequently, transnational governance refers to the activities, institutions, actors, or processes that cross at least one national border, and transnational actors, institutions, and spaces cannot be reduced to agreements between national states (Djelic & Sahlin-Andersson 2006:3; Hale & Held 2011: 15; Morgan 2006: 140–142). Some of the same ideas are discussed in the global governance literature, where 'global governance' refers to efforts to develop regulatory policies in response to global problems in the absence of an overarching political authority (Ansell & Torfing 2016: 2). A core idea in the

global governance literature is that governance is more than making or enforcing rules, and there are steps both before and after the making and enforcing of rules that are crucial to political outcomes (Avant et al. 2010: 14). For example, organizational scholars have shown that regulations do not develop at a superficial policy level, but in the activities and interactions of organizations (Jacobsson & Sahlin-Anderson 2006: 265). An important insight is that governing globally is never a solo act because a wide range of problems cannot be solved by sovereign states alone (Karns et al. 2015: 1), and scholars are therefore encouraged to focus on relationships among actors involved in global governance (Finnemore 2014; Weiss & Wilkinson 2018: 13).

The public administration (PA) literature mirrors some of the same debates in a quest to understand government structures and functions (Raadschelders 2011: 1). The traditional view on government is that social and economic relations are governed through a chain that links voters, parliamentary assemblies, executive political leaders, public bureaucracy, and citizens through a series of delegation and control relations (Ansell & Torfing 2016: 4). However, in the early 1970s, a highly important discussion emerged on how to govern effectively and democratically in a world where political authority, capacity, and power are fragmented, distributed, or constrained (Ansell & Torfing 2016: 5; Peters & Pierre 1998). These discussions signalled a weakening of the state-centric view of power and societal steering and highlighted an understanding of private and civil society actors as resources, rather than merely passive targets and subjects of public regulation (Ansell & Torfing 2016: 2). Hence, lively debate over the role of the state surfaced in the 1980s, as both scholars and politicians suggested that the state was too small to solve the world's big problems and too big to solve the small ones (Jessop 2013). Public administration therefore faces challenges related to handling big transboundary wicked problems, wherein the structure of the problem does not overlap with the organizational structure (Lægreid 2020: 436). Some scholars proposed that there has been a 'hollowing out of the state' described by three different processes: the state has been hollowed out from above (by international interdependencies), from below (by marketization and networks), and from the sides (by agencies) (Rhodes 2007). This process has been deliberately and provocatively pronounced through statements such as "from government to governance" and "governing without government" (Kjær 2011). However, scholars have also argued that despite persistent rumours to the contrary, the state remains the key political actor and that they have proven to be surprisingly resilient and innovative in meeting new challenges (Pierre & Peters 2020: 15). Moreover, the state remains the main source of political authority and financial resources, and some have argued that far from disappearing, states are in fact enhancing their capacity to govern by developing closer ties with non-governmental sectors (Bell & Hindmoore 2009; Pierre & Peters 2020: 15). According to this perspective, the important role of the state is not decreasing; it is being transformed from a role based on constitutional powers to a role based on coordination and fusion of public and private resources (Pierre & Peters 2020: 15).

By studying governance processes in the nuclear safety sector, this thesis engages in discussions on how to address wicked problems in an increasingly interconnected world. It thus reflects discussions on coordination and cooperation in both the IR and PA literatures.

1.4 The structure of this thesis

This thesis consists of two main parts:

I. Part one comprises the synopsis in five sections. The introduction presents the main ambition of this thesis and briefly outlines the three articles included in this thesis. It also defines some core concepts and situates this thesis within relevant streams of literature. Section 2 discusses the main findings and contributions, while Section 3 presents the theoretical framework. Section 4 introduces the philosophical underpinnings and methods of this thesis, and Section 5 summarizes the main conclusions drawn from this thesis.

II. Part two presents the three individual articles:
   1. "Dynamics of Agency Governance. Evidence from the Norwegian Radiation and Nuclear Safety Authority"
   2. "Nordic Cooperation in the Nuclear Safety Sector: High, Low, or Differentiated Integration?"
   3. "Global governance and inter-organizational relationships in the Nuclear Safety Sector".

2 Main findings and contributions to the literature

This section summarizes the main findings and contributions of the articles comprising this thesis and shows how these contributions are linked to relevant literature.

2.1 Main findings

In this section, the empirical and theoretical findings of each of the articles are presented.

2.1.1 Article 1: Empirical and theoretical findings

Article 1 investigates governance processes within a single agency, namely the DSA. Its main empirical finding is that both hierarchical and horizontal governance processes are embedded in the DSA. Agency governance is thus compound. To reach this conclusion, three models are developed to conceptualize potential governance processes within the agency (Table 2).

First, there is the governmental model, a hierarchical model wherein government agencies are seen as subordinated to parent ministries. According to this model, tasks, responsibilities, and resources are allocated from the parent ministry; therefore, agency officials are likely to enjoy limited autonomy in their daily work and engage frequently with their parent ministry. Steering signals and mandates that originate from national parent ministries are vital to the agency, and role perceptions and loyalties among agency personnel are likely to be directed toward the parent ministry in particular.

Second, the supranational model, also a hierarchical model, characterizes government agencies as being closely aligned to supranational institutions and relatively loosely coupled to national parent ministries. Moreover, the model proposes that domestic agencies may embrace tasks related to EU regulatory governance, policymaking, and implementation. Hence, the expectation is that the employees' role perceptions and loyalties are geared toward supranational rather than national institutions and, therefore, that they favour steering signals originating from supranational institutions.

The last model, the transnational model, is a horizontal model that assumes agencies are loosely coupled to parent ministries *and* supranational institutions. Agencies thus enjoy large degrees of discretion based on their expertise and skills, and they are not mere instruments in the hands of political leaders. Moreover, agencies are strongly connected to transnational epistemic communities consisting of networks of professionals with recognized expertise and policy-relevant knowledge in a domain. Agency governance is thus biased by internal and external professional reference groups, and behaviour is guided by considerations of scientific and professional correctness.

The findings show that the DSA is internally torn between the governmental and the transnational model, and agency governance is thus compound. However, agency personnel across the agency strongly emphasize their role as experts; hence, transnational dynamics are prevalent throughout the agency. The findings also suggest that the agency is relatively autonomous, mainly due to its expertise, and that horizontal interaction with other experts and epistemic communities is crucial for the functioning of the agency.

Table 2. A conceptual map of compound agency governance

	Governmental model	*Supranational model*	*Transnational model*
Degree of autonomy	Low*	Low**	High***
Provider of premises	Parent ministry	Supranational institutions	Epistemic communities
Core tasks	Domestic regulatory governance	EU regulatory governance	Knowledge production and knowledge exchange
Role perception	National civil servant	Supranational civil servant	Independent expert
Loyalty	To national-level institutions	To supranational institutions	To epistemic communities

* Toward national ministries
** Toward supranational institutions
***Toward both supranational institutions and national ministries

Theoretically, the study's findings suggests that three structural variables derived from organization theory contribute to explaining agency governance: organization size, horizontal specialization, and vertical specialization. These endogenous organizational characteristics are vital determinants in balancing behavioural logics within agencies. In particular, the observations reflect how ministerial and agency capacity (organization size), technical portfolios (horizontal specialization), and vertical specialization explain variation.

2.1.2 Article 2: Empirical and theoretical findings

Article 2 shows that the degrees of integration, and thus the horizontal governance processes studied in the article, are differentiated between the highly integrated areas of radiation protection and emergency preparedness and the less integrated areas of nuclear security and safeguards. To gain these insights, the article investigates coordination and integration between all the Nordic authorities on radiation and nuclear safety. Integration is conceptualized as a continuum from low to high degrees of integration, and integration is measured

via four proxies (Table 3): contact pattern, trust, formalization, and resources in addition to the perceived importance of cooperation.

Table 3. Operationalization of integration

Proxy	Low degree of integration	High degree of integration
Contact pattern	Infrequent communications flows	Regular communications flows
Trust	Low reciprocal trust	High reciprocal trust
Formalization	None or ad hoc	Permanent structures
Resources	Resources remain in each authority	Pooled resources
Perceived importance *	Low	High

Note: * Of the cooperation.

Theoretically, the findings indicate that path-dependent processes and portfolios are important to gain an understanding of horizontal governance processes between functionally similar agencies operating at the same level. In so doing, the findings highlight the explanatory value of variables derived from historical institutionalism and organization theory to understand such governance processes.

2.1.3 Article 3: Empirical and theoretical findings

Article 3 investigates the three most important global actors within the nuclear safety sector, namely UNSCEAR, the ICRP, and the IAEA, and the inter-organizational relationships between these organizations. Furthermore, the paper is particularly concerned with cooperation and conflicts, and it conceptualizes cooperation and conflict as opposite ends of a continuum (Table 4). Cooperation is thus recognized by continuous flows of information, high trust, distinct resources other organizations need, and a clear separation of tasks and responsibilities between organizations working within the same domain, while conflicts are conceptualized as the opposite. Hence, tensions arise in inter-organizational relationships due to decreasing degrees of cooperation, and tensions might lead to conflicts.

Table 4. Conceptualization of cooperation and conflicts

Cooperation	Conflicts
Continuous flows of information	No flow of information
High trust	Low trust
Distinct resources other organizations need	Overlap of resources
Clear separation of tasks and responsibilities	Overlap of tasks and responsibilities (functions)

The article finds that big inter-governmental organizations (IGOs) which hold political authority, like the IAEA, are more autonomous and less vulnerable than small non-governmental organizations (NGOs), like the ICRP. It is therefore less likely that conflicts will emerge between such organizations because small NGOs actively will adapt to big IGOs to uphold cooperation and remain relevant. However, tensions might develop more easily between small IGOs, like UNSCEAR, and small NGOs operating within the same domain when they are dependent on overlapping resources. The data also indicate that expert bodies, like UNSCEAR and the ICRP, operating within the same domain more easily will duplicate each others' portfolios and hence increase the likelihood of functional overlap and domain conflicts.

Theoretically, the study's findings indicate that organizational factors such as organization type and organization size are important for explaining patterns and variations in inter-organizational relationships. Moreover, the article highlights in particular the importance of organizational birthmarks in explaining the findings. Hence, the article suggests that these three variables are valuable in order to understand governance processes at the global level.

2.2 Main contributions
This section summarizes the empirical and theoretical contributions of this thesis and suggests how the findings of the articles add to relevant literatures.

2.2.1 Empirical contributions
The empirical contributions of this thesis are presented in two parts: general contributions and the specific contributions of the three papers. First, the general contribution of this thesis is related to the study of governance processes in an understudied sector, namely the nuclear safety sector. Hence, we lack knowledge and understanding of which actors are present and influential in the sector and how they work together to impact nuclear safety across the globe. Moreover, actors in this sector are involved in issues of great interest to individual states and the global community; therefore, increased insight into how different actors function and interact to develop and implement standards, regulations, and laws is crucial. The aim is therefore to advance knowledge about the nuclear safety sector by mapping and unpacking individual actors and internal governance processes, and also by studying relationships between actors primarily at different levels. Moreover, all the articles make a general empirical contribution by conceptualizing governance processes within the sector.

The three articles provide the following empirical contributions: Article 1 unpacks agency governance by studying the behaviour and perceptions of agency personnel. In so doing, the paper makes three main empirical contributions. First, the study contributes to an *organizational turn* in the public policy and

administration literature by conceptualizing the compound nature of agency governance and by offering a micro-level lens mapping variation in behavioural dynamics among agency staff inside one agency. Second, the article contributes to the regulation literature. Scholars have been particularly interested in understanding the relationship between the scope of state authority and the role of regulatory bodies (Levi-Faur 2011: 3–5), and the empirical data suggest an intimate relationship between regulation and the role of government agencies (Koop & Lodge 2017; Levi-Faur 2011: 5; Majone 1996: 9). Furthermore, scholars have argued that the regulatory state is increasingly embedded in complex webs of non-state actors and that their *modus operandi* is difficult to disentangle from other relevant actors (Djelic & Sahlin-Andersson 2006: 9). Article 1 contributes to the regulatory state literature by showing how expertise-based transnational agency governance is prevalent even in portfolios of core-state powers, defined by their "institutional significance for state-building" (Genschel & Jachtenfuchs 2014: 1). Lastly, the paper contributes to the multilevel administrative governance (MLA) literature in the EU. The MLA literature suggests that agencies in the EU have become multi-hatted by playing important roles not only for national governments but also for the European Commission, EU agencies, and regulatory networks (Egeberg & Trondal 2017). Institutions at different levels of government are thus linked together in the performance of tasks (Trondal & Bauer 2017). Article 1 shows that the supranational model is the least relevant model to describe agency governance, and consequently, the EU plays a secondary role in everyday affairs at the DSA and does not affect deep-seated role perceptions and loyalties among the staff. These findings may indicate that EU-level institutions lack the capacity to bypass ministry departments and profoundly influence domestic agency governance in the nuclear safety sector.

Article 2 makes four main empirical contributions. First, the study contributes to the literature on differentiated integration (Gänzle et al. 2020) by showing how national authorities and agencies act as incoherent wholes where patterns of cooperation and degrees of integration vary between different sections within the same authority. Second, the article contributes to the literature on inter-administrative coordination, which predominantly has been concerned with the proliferation and effectiveness of inter-administrative relations in promoting common principles, rules, and best practices (Keohane & Nye 1974; Slaughter 2004). Article 2 adds to this literature by unpacking the cooperation itself and by studying the preconditions that guide inter-administrative coordination from the outset. Hence, the findings offer insight into how cross-territorial cooperation between functionally similar authorities at the same level functions and evolves over time, highlighting how they manage to pool and exploit common resources across territories. Third, the study reflects organizational–institutional approaches to political science by suggesting that governance processes under stress may revert to or strengthen established organizational traditions, practices, and formats, reinforcing institutional path dependencies (Gänzle et al. 2020: 15). Thus, crises may produce critical junctures that generate 'windows of

opportunity' for more integrated cooperation, and the study shows under which conditions crisis and external shocks might lead to either more integrated cooperation or its breakdown. Lastly, the article contributes to the literature on Nordic cooperation and serves as an example of how vital cooperation between the Nordic countries is channelled through flexible platforms situated below the political level (Trondal & Stie 2020).

Article 3 makes two main empirical contributions. First, a model is developed to explain different degrees of cooperation and conflict between international organizations (IOs), which contributes to the literature on inter-organizational relations in world politics by showing how synergies are created and how tensions and conflicts might develop between IOs. Understanding such dynamics has been identified as one of the core challenges of global governance (Biermann & Koops 2017: 2). Second, the paper contributes to the international public administration literature by highlighting the important role of international bureaucracies in global governance. In so doing, the paper does not expect IOs to act as coherent wholes, and studies suggest that non-elected bureaucrats may use their central position, privileged access to information, technical expertise, and professional authority to influence global governance (Bauer & Ege 2016). This paper shows how international secretariats are important for facilitating information sharing and trust between organizations and how they, in turn, influence degrees of cooperation and conflict between organizations.

2.2.2 Theoretical contributions

The main theoretical contributions of this thesis draw on the explanatory value of historical and organizational factors to understand governance processes. This approach may be situated within the framework of Scandinavian new institutionalism and a partly Norwegian tradition, which some have named the 'Bergen Approach' to political organization (Olsen 2018a). The Scandinavian approach to political organization is a mixture of political science and organization theory, and the approach has brought organization theory 'back in' (Olsen 2018a). The approach is recognized by being process oriented, by applying qualitative methods and by claiming that the historical-institutional context must be taken into consideration (Boxenbaum & Pedersen 2009: 196; Christensen and Lægreid 2018: 1089). Moreover, the tradition emphasizes how organizations function in practice, rather than how they are supposed to work within the formal-legal framework (Lægreid 2020: 224, 426), and scholars are therefore encouraged to go beyond describing political institutions on the basis of their legal status and also beyond the assumption that such institutions are perfectly governed (Olsen 2007).

Generally, new institutionalism highlights the importance of both the context of political life and the organization of political life (March & Olsen 1984; Steinmo 2008). Based on this approach, and on the Scandinavian approach in particular, the core assumption of this thesis is that history and organization matter when

attempting to understand governance processes and how organizations function (Lægreid 2020: 427–428; Olsen 2018a). The first assumption is that the historical–institutional context is important for understanding how institutions function (Lægreid 2020: 424). Hence, scholars emphasize the problems of universal, non-contextual explanation, and as different institutions are located differently in time and space, there is a need to study the relations between the historical development of problems and conflicts, the possible solutions attended to, and organizational forms and processes (Olsen 2018a). Consequently, theory building at the meso-level, which takes specific historical–institutional contexts into account, is likely to be more fruitful than generic, universal explanations (Olsen 2018a). In line with such ideas, scholars ask: How does the past affect the future, and how do public administrations and formal organizations learn (or fail to learn) from experience and adjust to varying and changing environments (Olsen 2018a). The second assumption is that patterns of governance cannot be adequately understood without including organizational factors (Lægreid 2020: 423), and a core question is what difference organizational factors play in governance processes (Egeberg & Trondal 2018). Moreover, organizations are not only understood as technical instruments in the hands of leaders, but also as partly autonomous actors that do not adapt in a simple and straightforward way to new steering signals or to changing environmental pressure (Lægreid 2020: 423). Hence, the starting point is to underscore the importance of formal organization as the dominant agent in administrative and political life and highlight the explanatory power of organization theory (Olsen 2018a). The main theoretical contributions of this thesis are thus related to these two assumptions, and the next sections will elaborate on the concrete theoretical contributions of the three individual papers.

History matters
This thesis contributes to the literature on historical institutionalism and organizational birthmarks (imprinting) by demonstrating the relevance of historical contexts to understand governance processes at different levels. It thus takes history seriously and highlights the explanatory value of historical variables. Hence, this thesis illuminates how the past affects the present, how organizations learn, develop, and change through experiences, and if or how they adjust to changing environments. Articles 2 and 3 make use of historical variables to explain the empirical findings and show that these variables are important for understanding the findings.

Article 2, which concerns Nordic cooperation, analyses the data according to variables derived from historical institutionalism. The article explores path-dependent processes and critical junctures and suggest that Nordic cooperation is more integrated if the cooperation has had success in achieving stated goals, which results in positive feedback and self-reinforcing dynamics. Moreover, integrated cooperation is more likely if there is a longstanding history where critical junctures have strengthened the cooperation. Finally, integration increases if the cooperation has shown robustness despite external changes and

shocks. The findings suggest the importance of path dependency by highlighting two different path-dependent mechanisms. First, positive feedback makes deviation from existing paths less likely, and second, critical junctures display the robustness of the cooperation when confronted with external shocks and changes. Thus, path-dependent mechanisms demonstrated through the longstanding history and success of Nordic cooperation on radiation protection and emergency preparedness, contributes to explaining why this cooperation remains important and relevant.

Article 3 argues that all organizations, and also inter-organizational relationships, have birthmarks; that is, they are marked by the time in history in which they emerge and the available ideas and resources at that time (Olsen 2018b). Moreover, an organization's characteristics at the time of its founding tend to remain and be carried into the future (Gornitzka & Sverdrup 2011). Consequently, the basic structure of the organization remains relatively stable (Stinchcombe 1965: 153), and through institutionalization processes, organizations create coordination mechanisms and communication channels that persist (Marquis & Tilcsik 2013; Scott 2008: 124). Hence, the article suggests that birthmarks are important to understanding cooperation and conflicts in inter-organizational relationships because they provide a deeper understanding of why tensions are triggered in relationships with a longstanding history of cooperation. The data suggests that potential conflicts between organizations may be held in check as long as important functions related to the birthmarks remain relatively stable. However, when changes occur, organizations may fail to adapt due to the birthmarks they carry, and it can trigger tensions which have been a latent part of the inter-organizational relationship from the beginning.

Organization matters
The second theoretical contribution is based on the use of variables derived from organization theory. By applying such variables, this thesis corroborates the relevance of organizational variables in understanding governance processes. The three articles all show how organization theory might be applied and also the explanatory value of organization structure. In addition, the articles couple organization theory and the literatures on governance and political science in general. Even though these streams of literature have overlapping agendas, the relationships between them have been marked by mutual neglect (Jönsson 2017: 50; Levi-Faur 2012; Olsen 1991; Olsen 2007). This thesis serves as an example of how these streams of literature can be linked to provide insights and spark fruitful discussions. The next sections highlight the individual articles' contributions related to the organizational variables applied.

Article 1 investigates endogenous agency dynamics, and the findings highlight the compound nature of agency governance and suggest organizational conditions thereof. The paper makes two main theoretical contributions. First, the study contributes to an organizational turn in the public policy and administration literature by illuminating how agency governance reflects endogenous

institutional factors. The study demonstrates that endogenous organizational characteristics are vital determinants in balancing behavioural logics within the agency. In particular, it reflects how variation in both ministerial and agency capacity, the technical portfolio of the agency, and the vertical specialization of the DSA vis-à-vis three parent ministries provide important insights into why the agency functions as it does and why a transnational model of agency governance is especially prevalent. Second, the DSA serves as a *least likely* case of multilevel governance (MLG) by offering a most difficult test (Gerring 2007:115; Gerring 2017:103): As partly a core-state portfolio, which for instance include foreign policy and defence policy (Genschel & Jachtenfuchs 2014: 1), agency governance is likely to be biased toward a governmental model in which the agency serves as a ministerial toolkit. However, the findings show that agency governance is compounded due to the organizational characteristics of the agency. Hence, the article demonstrates the explanatory power of organizational variables by testing them on a least likely case.

Article 2 makes two main contributions. First, the study adds to the organization theory-based institutional approach in public administration research by highlighting how national expert authorities, placed in the state administration, are partly autonomous institutions where a great deal of what is important originates from epistemic communities. Second, the paper suggests that horizontal specialization is particularly important to understand cooperation between the Nordic authorities in the nuclear safety sector. In short, horizontal specialization shows how different policy areas and issues are supposed to be linked together or decoupled from each other and hence, it influences the division of portfolios in organizations (Egeberg & Trondal 2018: 8). The Nordic radiation and nuclear safety authorities' overall portfolios may be viewed through two different lenses. The first lens divides the portfolio into core-state and non-core portfolios, while the other lens divides the portfolios into the three pillars of safety, security, and safeguards. Two observations follow. First, there is less cooperation and lower degrees of integration between the Nordic authorities on core-state portfolios because these policy areas are more closely tied to the national government and parent ministries. Second, cooperation between the authorities follows departmental lines, and units with shared sector affiliation cooperate more easily. The paper thus suggests the importance of structural variables, and horizontal specialization in particular, to explain governance processes between functionally similar agencies.

Lastly, Article 3 provides two main contributions related to organization theory. First, it helps to bridge the gap between the literature on IOs and organization theory. Traditionally, the relationship between these two streams of literature has been marked by mutual disregard (Jönsson 2017: 50), and Reinalda (2013: 15) even describes the gap as "deep and persistent". Although progress has been made, the invitation to bridge the gap between traditional IR and the sociology of organizations is still to be fully accepted (Reinalda 2013: 15). This paper shows how variables derived from organization theory, such as organization size,

contribute to explaining relationships between IOs situated at the global level. Second, cooperation between IGOs and NGOs is not well understood (Steffek 2013), and achieving policy coherence and synergy between IGOs and NGOs has been identified as one of the core challenges of global governance (Biermann & Koops 2017: 2). This paper demonstrates the importance of considering organizational variables to understand the relationships between IGOs and NGOs, i.e., the degree of cooperation and conflicts between such organizations.

3 Toward a theoretical framework

This section discusses the theoretical underpinnings of this thesis and shows how the theories are applied in the articles. The theoretical lenses utilized in the articles are historical institutionalism, organizational birthmarks, and organization theory, all of which are related to new institutionalism. This section thus illuminates what new institutionalism is and describes the main new institutional perspectives: rational choice, sociological institutionalism, historical institutionalism, and discursive institutionalism. This outline forms the foundation for discussing the main assumptions of this thesis: history matter and organization matter. Next, the application of the theories applied in the articles is explained, and lastly, new institutionalism is discussed from a broader perspective.

3.1 New institutionalism

An interest in the nature of institutions and how they structure the behaviour of individuals can be traced all the way back to antiquity and the very first thinking about political life (Peters 2019: 3). Plato's *Republic* discusses different forms of government and how institutions shape political behaviour, while Aristotle studied institutional structures because he believed they shaped political incentives and normative values (Steinmo 2008). Hence, philosophers long ago understood the importance of political institutions in structuring political behaviour, and institutional theory is as ancient as the study of politics (Steinmo 2008). From this age-old root, the so-called 'old institutionalism' grew during the late nineteenth century and the first half of the twentieth century and thus coincided with the emergence of social sciences as a modern academic discipline (Peters 2019: 7; Steinmo 2008). The old institutionalists were concerned with questions such as the role of law in governing, the role of structures to explain behaviour, how political systems were embedded in their history, and normative questions about 'good governance' (Peters 2019: 8–13). Old institutionalism was a core feature of political science for several decades; however, the discipline was radically transformed through 'the behavioural revolution' and by the emergence of the rational choice approach in the 1950s and 1960s (Peters 2019: 14). These approaches shared some important features, such as a focus on theory development and a desire to eliminate the normative dimension from political science. However, one of the most important features of the rational choice approach was the argument that decision-making individuals are the only actors in political settings and, therefore, that they and their behaviour are the only appropriate foci for political inquiry (Peters 2019: 17). Hence, when zooming out on the social sciences by the 1960s and 1970s, two distinct traditions appear: the largely atheoretical micro-analyses of political behaviour on the one hand, and macro-theorizing such as Marxism and functionalism on the other. Within these traditions, the meso-level of institutions were either viewed as functional solutions to social problems or as simple arenas where political battles took place, and the specific construction of the arena was considered unimportant (Steinmo 2008).

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Against this backdrop, new institutionalism emerged in the late 1970s and early 1980s when scholars such as James G. March, Johan P. Olsen, Walter W. Powell, and Paul J. DiMaggio began discussing and critiquing the core features of the behavioural revolution and the rational choice approach. In short, the new institutionalists asserted that "the organization of political life makes a difference" (March & Olsen 1984) and that collective action should be the dominant approach to understanding political life (Peters 2019: 22). Moreover, they asserted that institutions are more than the sum of individual-level preferences and properties and, therefore, that institutions are more than 'epiphenomena' (DiMaggio & Powell 1991: 2). New institutional scholars were thus concerned with the difficulties of determining what human actors want when preferences are affected by the institutional contexts in which these preferences are voiced. Rather than answering this question by studying individual psychology, these scholars began analyzing the impact of procedures and structures for aggregating individual wishes into joint decisions (Immergut 1998).

New institutionalism was enhanced through path-breaking papers and books, which naturally placed institutions centre stage. Among these were DiMaggio and Powell's (1983) analysis of isomorphism, in which they start out by asking the following question: What makes organizations so similar? March and Olsen published their influential work "The New Institutionalism: Organizational Factors in Political Life" in 1984, arguing that political scientists must rediscover institutional analysis to better understand the behaviour of individual political actors within political institutions (Ishiyama & Breuning 2014). In this view, institutions have explanatory power of their own, and organizational practices and informal norms and routines are highlighted instead of legal structures and rules (Olsen 2018a). Consequently, an *institutionalist* is a scholar who places special emphasis on the nature of institutions and the role institutions play in structuring behaviour (Steinmo 2008).

But what exactly *is* an institution? The answer is not obvious. Some definitions of institutions emphasize cognitive and cultural components, while others focus on behavioural and structural aspects (Alvesson & Spicer 2019). Moreover, certain scholars simply define institutions as rules and concentrate on formal rules and organizations, while others address informal rules and norms (Steinmo 2008). In this thesis, however, a broader perspective on institutions is applied. In this vein, Peters (2019) proposes that institutions have four important features. First, institutions are structural elements of societies. These structures can be formal (an agency in the public bureaucracy or a legal framework) or informal (networks or shared norms). Second, institutions suggest some stability over time. Third, institutions affect individual behaviour and create patterned interactions that to some degree are predictable (Lowndes & Roberts 2013: 3). Finally, there should be some sense of shared values and meaning between the members of an institution (Peters 2019: 23). Peters' definition overlaps with

March and Olsen's' definition, stating that "an institution is a relatively enduring collection of rules and organized practices, embedded in structures of meaning and resources that are relatively invariant in the face of turnover of individuals and relatively resilient to the idiosyncratic preferences and expectations of individuals and changing circumstances" (Christensen & Lægreid 2021: 180; Olsen 2007).

Furthermore, in some streams of literatures on new institutionalism, it might be difficult to differentiate between institutions and organizations (Peters 2019: 156). However, implicit in Peters' and March and Olsen's definitions, and in line with Selznick (1957), is the suggestion that *institution* refers to the gradual development of informal norms and values through a mutual adaptation to internal and external norms, while *organization* refers to formal norms and technical tasks (Christensen & Lægreid 2018). Through the process of *institutionalization*, organizations then become 'infused with values', i.e., specific identities or cultures that impact the behaviour of the members of the institution through the logic of appropriateness, for example, where people try to match situations with important pre-existing identities and expectations, following internal cultural rules of behaviour (Christensen & Lægreid 2018; March & Olsen 1989). Hence, institutionalization can be seen as the difference between newly formed structures and older structures: newly formed structures will probably have low levels of institutionalization; however, over time, routines will be created, shared values will develop and accepted patterns of behaviour will be established, which indicates that the structure has been institutionalized (Peters 2019: 219). Therefore, a challenge to the researcher is to find a way to measure different degrees of institutionalization (Peters 2019: 232).

The tradition of new institutionalism does not constitute a unified body of thought (Hall & Taylor 1996; Peters 2019: 22; Steinmo 2008). However, traditionally three different approaches, each of which calls itself 'new institutionalism', have been identified: rational choice institutionalism, sociological institutionalism, and historical institutionalism (Hall & Taylor 1996; Schmidt 2008; Steinmo 2008). What these approaches have in common is that they developed as reactions to the rational choice and behavioural perspectives that were influential during the 1960s and 1970s. Hence, they all critique the overemphasis on agency without structure and seek to elucidate the role of institutions in the determination of social and political outcomes (Taylor & Hall 1996; Schmidt 2008). More recently, scholars have also proposed a fourth approach, namely discursive institutionalism (Schmidt 2008), and the following discussion elaborates briefly on each of these four approaches.

First, rational choice institutionalism focuses on the role of institutional factors in structuring individuals' choices (Lowndes & Roberts 2013: 2). Moreover, the rational choice approach tends not to theorize preference formation, and actors are assumed to behave instrumentally to maximize the fulfillment of their preferences. This implies a highly strategic behaviour that presumes extensive

calculation. Moreover, rational choice institutionalists tend to see politics as a series of dilemmas where individuals acting to maximize their own preferences are likely to produce an outcome that is collectively sub-optimal (Hall & Taylor 1996). Furthermore, rational choice institutionalists believe that agents follow rules because humans are strategic actors who want to maximize their personal or individual gain. Consequently, cooperation is preferable if more is gained through cooperation than without it, and rules are followed if agents do better when they do so (Steinmo 2008). From this perspective, institutions are systems of rules and incentives to behaviour in which individuals attempt to maximize their own benefits (Peters 2019: 24). Moreover, institutions structure interactions by affecting the range and sequence of alternatives and by providing information and enforcement mechanisms that reduce uncertainty (Hall & Taylor 1996). Institutions are thus important because they frame the individual's strategic behaviour (Steinmo 2008) and emerge to meet social and economic necessities (Peters 2019: 24).

Second, there is a clear divide between rational choice and sociological institutionalism, and the latter opposes the idea that many of the institutional forms and procedures used by modern organizations are adopted simply because they are the most efficient for the tasks at hand (Lowndes & Roberts 2013: 12). Instead, sociological institutionalists argue that forms and procedures should be seen as culturally specific practices, and a basic idea is that humans are fundamentally social beings (Hall & Taylor 1996; Steinmo 2008). Sociological institutionalists, however, do not resist the idea that individuals are purposive, goal-oriented, or rational, but they highlight that what an individual will see as rational is socially created. Moreover, sociological institutionalists suggest that humans in general will follow a 'logic of appropriateness' – meaning that instead of asking ourselves 'what do I get out of X?' people first ask 'What *should* I do? What is appropriate?' (Steinmo 2008). Hence, if an institution is effective in influencing the behaviour of its members, those members will think less about the personal consequences of their actions and more about whether an action conforms to the norms of the organization (Peters 2019: 35). Consequently, the logic of appropriateness is more important than a 'logic of consequentiality' in influencing attitudes and behaviour (Christensen & Lægreid 2021: 179). Hence, if rational choice theorists posit a world of individuals and organizations seeking to maximize their material well-being, sociologists posit a world of individuals and organizations seeking to define and express their identity in socially appropriate ways (Hall & Taylor 1996). Sociological institutionalists thus argue that organizations often adopt new institutional practices, not because they advance the efficiency of the organization, but because it enhances the social legitimacy of the organization or its participants (Hall & Taylor 1996).

Third, historical institutionalism suggests that human beings are both norm-abiding rule followers and self-interested rational actors and that how one behaves depends on the individual, the context, and the rule (Steinmo 2008). What the historical institutionalist thus wants to know is why a certain choice

was made and why a certain outcome occurred, and the historical institutionalist will go to the historical record to find out (Steinmo 2008). Moreover, historical institutionalism defines institutions as the formal or informal procedures, routines, norms, and conventions embedded in the organizational structure, and the basic point of analytical departure is that the choices made when an institution is being formed, or when a policy is initiated, will have a continuing and largely deterministic influence far into the future (Hall & Taylor 1996; Peters 2019: 80). Hence, these initial choices and the institutionalized commitments that follow are argued to determine subsequent decisions, and unless we understand these initial choices, it will be difficult to understand any further developments (Peters 2019: 24).

Lastly, discursive institutionalism has emerged as a critique of the three traditional new institutional approaches. Hence, in their effort to develop explanations that take institutions seriously, the traditional approaches to understanding institutions are criticized for being 'sticky', and the agents have been viewed as static in terms of preferences or fixated in terms of norms (Schmidt 2008). The discursive approach thus suggests that the key problem for the traditional approaches of new institutionalism is the subordination of agency (action) to structure (rules) (Schmidt 2008). To address this problem, discursive institutionalists propose the need to take ideas and discourse in the institutional context seriously and to take a more dynamic view of change compared to traditional approaches (Schmidt 2008). Hence, discursive institutionalists propose that institutions are both given (as the context within which agents think, speak, and act) and contingent (as the results of agents' thoughts, words, and actions), and institutions are therefore internal to the actors (Schmidt 2008). As a result, agents create and maintain institutions by using their background ideational abilities, which underpin agents' ability to make sense of the rules and rationality of a setting and their foreground discursive abilities through which agents may change their institutions. Taken together, these discursive abilities represent the 'logic of communication', which "enables agents to think, speak, and act outside their institutions even as they are inside them, to deliberate about institutional rules even as they use them, and to persuade one another to change those institutions or to maintain them" (Schmidt 2008). Hence, according to the discursive institutional approach, this communicative logic is better suited to explaining institutional change and continuity compared to the three traditional new institutional approaches (Schmidt 2008).

3.2 History and organization matter in new institutionalism

The theoretical dimension of this project draws on the explanatory value of historical and organizational variables to understand governance processes, and this thesis argues that these variables are closely linked to new institutionalism. In this vein, scholars propose that, despite their differences, the new institutional perspectives address similar problems (Immergut 1998). The conventional contrasts emphasized between the new institutional perspectives are thus

reduced, and scholars show how both historical elements and organizational factors may provide important answers to general institutionalist questions (Christensen & Lægreid 2021; Immergut 1998; Thelen 1999). The next sections show how the core assumptions of this thesis are coupled to new institutional theory and how the theoretically derived variables are used in the articles.

3.2.1 History matters in new institutionalism

In recent years, the structuring and behaviour of organizations are increasingly being explained by the concept of process, and some features seem to be particularly key when aiming to understand an organizational process theory: a process encompasses several events, these events are sequential, and thus they are imprinted by the preceding course of action and its characteristics – hence, "history matters" (Schreyögg & Sydow 2011). From a political science perspective, this is described as follows: First, political events occur in historical contexts that have direct consequences on decisions and subsequent events. Therefore, rather than treating all political action as fundamentally the same regardless of time, place, or context, scholars attempt to situate their variables in the appropriate context. Second, actors can learn from experience and that what happens at time A will affect what happens at time B. Finally, expectations and actions are moulded by past experiences. The basic point is thus that history is not a chain of independent events, and scholars must be aware that important variables can, and often do, shape one another (Steinmo 2008).

Within the new institutionalist tradition, the focus on historical concerns is most apparent in historical institutionalism. A historical institutionalist approach suggests that organizational change is dependent on and locked in by pre-existing institutional formats; however, they may be unlocked by crises and shocks (Egeberg & Trondal 2018: 21). Historical institutionalism is thus focused on the construction, maintenance, and adaptation of institutions by emphasizing the origin and evolution of the rules, norms, and practices that shape policy outcomes and the structure of polities (Fioretos et al. 2016; Sanders 2006: 42). A core concept in historical institutionalism is 'path dependency', which scholars describe as "dynamic processes involving positive feedback" (Fioretos et al. 2016; Peters 2019: 82). Path dependency thus overlaps with the idea of 'increasing returns' (Pierson 2000). Both concepts capture a basic element in understanding path dependency by displaying how the costs of changing from one alternative to another will increase over time, creating a self-reinforcing dynamic, making deviation from an existing path increasingly difficult (Fioretos et al. 2016; Pierson 2000). A path-dependent process is born through a 'critical juncture', "a period of significant change, which typically occurs in distinct ways in different countries (or in other units of analysis) and which is hypothesized to produce distinct legacies" (Collier & Collier 2002: 29). Thus, path dependency shows how particular historical junctures have lasting consequences. Path-dependent arguments based on positive feedback also propose that not only 'big' events have big consequences, but that small ones that happen at the right time

may also have major consequences (Pierson 2000). Furthermore, the literature on institutional change suggests that path-dependent lock-in is a rare phenomenon, opening the possibility that institutions normally evolve incrementally (Thelen & Mahoney 2010: 3). Many scholars have proposed that policies are 'path dependent' in the sense that they will remain on the same path until some significant force intervenes and diverts them from the established direction (Peters 2019: 24).

New institutionalism also has a special interest in the origin and construction of institutions (Fioretos et al. 2016; Sanders 2006: 42), and the concept of organizational *imprinting*, or organizational *birthmark*s, is thus important in new institutional theories (Marquis & Tilcsik 2013; Schreyögg & Sydow 2011). Organizational imprinting is based on the insight that organizations founded at one time have a different structure from those formed at another time (Schreyögg & Sydow 2011; Stinchcombe 1965: 154). Stinchcombe (1965: 154) argues that organizations must construct their systems with the resources available at the time of their founding. Moreover, the major thesis of organizational imprinting holds that the initial elements of an organization may persist for years and possibly decades (Schreyögg & Sydow 2011). This implies a causal relationship between the historical context at the founding of an organization and the organization's later structure (Schreyögg & Sydow 2011). More recent developments of the theory suggest that imprinting has three key features: the existence of a sensitive period, the strong impact of the environment during the sensitive period, and the persistence of the characteristics developed during the sensitive period despite significant changes in the environment (Marquis & Tilcsik 2013). In this view, sensitive periods are conceptualized as periods of transition, and the founding period is considered to be the key sensitive period for organizations. However, this perspective opens up the prospect of multiple sensitive periods (Marquis & Tilcsik 2013).

The concept of organizational birthmarks is based on organizational imprinting. In this thesis, the analytical idea related to birthmarks assumes that institutions are marked by the historical context of their founding, which includes the ideas and resources available at that time (Olsen, 2018b). Moreover, an organization's characteristics at the time of its founding tend to remain and be carried into the future (Gornitzka & Sverdrup, 2011). Consequently, the basic structure of an organization remains relatively stable (Stinchcombe, 1965: 153), and through institutionalization processes, organizations create coordination mechanisms and communication channels that persist (Marquis & Tilcsik 2013; Scott 2008: 124). In essence, the founders of an organization select and integrate historically specific components at the time of the founding, and these components may become routinized and thus lead to the imprinting of an organization's structure and behaviour long after the founding (Schreyögg & Sydow 2011).

Both the concepts of organizational imprinting and path dependency value the historical context to explain and understand how organizations are structured and

function. Moreover, both perspectives highlight the importance of initial conditions in the founding phase of an organization. However, organizational imprinting assumes that the initial conditions at the founding of an organization are more important than the evolving process of path formation (Schreyögg & Sydow 2011). Organizational imprinting is thus highly sensitive to initial conditions as carriers of history and less sensitive to later dynamics and long-term chains of events (Marquis & Tilcsik 2013; Schreyögg & Sydow 2011). Consequently, organizational imprinting assumes a logic where the initial conditions strongly influence the future of an organization, while path dependency highlights the increasing dominance of a pattern (Marquis & Tilcsik 2013; Schreyögg & Sydow 2011).

3.2.2 Organization matters in new institutionalism

The roots of organization theory are often linked to the classical works of sociologists such as Marx, Durkheim, and Weber and the discussions their work sparked among other scholars (Haveman & Wetts 2019). In this thesis, the relationship to Weber's work on bureaucracies is especially salient because he was one of the first to theorize about the essential role of organizational structure (Immergut 1998). However, there are three main reasons that his work was critiqued for not mirroring how real organizations function: the influence of the organizational environment, organizational change, and people's limited rationality (Haverman & Wetts 2019). Such ideas inspired the influential 1958 publication *Organizations* by Carnegie Tech professors James G. March and Herbert A. Simon, and the inter-disciplinary work of the Carnegie School developed a unique view of organizations that rested on three pillars: bounded rationality, routine-based behaviour, and learning (Germain & Cabantous 2013; Haverman & Wetts). Simon's key insight, for which he won the 1978 Nobel Memorial Prize in Economic Sciences, was that human beings are not the perfect calculators and decision-makers that economics assumed (Haverman & Wetts 2019). From a new institutional perspective, the Carnegie School's critique of rationality comprises the core of organization theory (Immergut 1998). Moreover, the Carnegie School treated organizations as the dominant agents in administrative and political life, and organizations were therefore viewed as a fundamental dimension of society (Olsen 2018a).

Some of the new institutionalism literature emphasizes the connection between sociological institutionalism and organization theory (Hall & Taylor 1996), and DiMaggio and Powell (1991: 11) claimed that "the new institutionalism in organizational analysis has a distinctly sociological flavor". However, organization theory is arguably more eclectic, and scholars suggest that "new institutionalism focuses on how institutions shape political life based on the beliefs that organizational factors are fundamental for understanding political continuity and change and that democratic governance and public administration evolve over time through endogenous adaptation and learning" (Christensen & Lægreid 2021: 180). A basic idea is thus that organizations are entities with

inherent dynamics of their own (Olsen 2018a), and within new institutionalism in general, organizational factors are ascribed a key role in explaining how organizations function, and hence, these factors may contribute to explaining political life and governance processes (Egeberg & Trondal 2018: 21).

In this vein, organizational theorists detail a set of variables and causal mechanisms that outline how organization may intervene in policy processes and eventually shape its outputs (Egeberg 2003: 77). In general, organization theory relies on four independent variables: structure, demography, locus, and culture, and it asks what difference they make in the governance process. Hence, the claim is that organizational characteristics systematically constrain, enable, and shape governance processes by mobilizing attention and capacity around certain problems and solutions, focus attention along specific lines of cooperation and conflict, and by creating conditions for actual coordination (Egeberg & Trondal 2018: vii). Of these four variables, this thesis focuses its attention on organizational structures. Although demography, locus, and culture may be both relevant and important, organizational scholars generally view structure as the most influential independent variable of the four (Christensen & Lægreid 2009; Scharpf 1977; Trondal et al. 2008).

Simon (1957) argues that the structural location of a civil servant will have an important influence on his or her behaviour because formal structures channel attention and capacity (Christensen & Lægreid 2009). Organization structure is therefore often defined as a normative structure consisting of rules and norms specifying, more or less clearly, who is expected to do what and how (Egeberg & Trondal 2018: 5; Scott & Davis 2016). Moreover, different dimensions of the organizational structure enable varied insights into *how* structures affect individual behaviour (Egeberg & Trondal 2018: 6–7). In what follows, the structural variables utilized in this thesis are outlined: organizational size, horizontal specialization, vertical specialization, organizational ownership, and organizational duplication.

- The *size* of an organization indicates its capacity to initiate policies, develop alternatives, implement decisions, and monitor compliance (Egeberg & Trondal 2018: 7). For example, studies have shown that the number of ministerial *staff* available for monitoring and steering agency activities influences the extent to which agency personnel allocate attention to political signals from their respective ministries (Egeberg & Trondal 2018: 86). Moreover, large organizations, in terms of staff size, are less dependent on other actors or organizations to carry out their tasks, and they are therefore more autonomous than smaller organizations. Consequently, small organizations must, to a greater degree than their larger counterparts, build capacity through other means such as cooperation, using the potential benefits of economies of scale (Jacobsen 2017: 203). In addition to staff size, *budgetary size* also supplies organizations with the capacity to act. For example, studies illustrate that

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if an agency largely depends on the government for its funding, its autonomy is constrained (Verhoest et al. 2004; Van Thiel & Yesilkagit 2014). Hence, the assumption is that government agencies that are largely dependent on their parent ministries for funding are likely to experience low degrees of autonomy and be closely monitored by the ministry. The basic idea is that the size of an organization, measured in staff size and budgetary size, supply capacity for organizations to act, and large organizations are less dependent on other actors to carry out their tasks. Organizations that do not have much resources in terms of staff and money may thus seek to work together with organizations that are better equipped to achieve their goals (Schneiker 2017: 326).

- *Horizontal specialization* refers to how different policy areas and issues such as health and energy are supposed to be linked together or decoupled from each other (Egeberg & Trondal 2018: 8); that is, horizontal specialization unifies or separates different concerns and considerations. Luther Gulick (1937) identified four ways in which tasks may be distributed horizontally among different entities: according to territory, purpose, function (process), or clientele. Tasks can be distributed according to either a specific geographical area (e.g., a nation state), a specific sector or policy area (e.g., health), a specified function (e.g., legal affairs), or a specific group of people (e.g., senior citizens). This is important because it is likely to influence both the division of labour and coordination between units, making coordination across units more challenging than coordination within units. Studies show that horizontal specialization by purpose (sector) biases decision-making behaviour toward a logic wherein preferences, contact patterns, loyalties and roles are directed toward policy sub-systems and portfolios (Egeberg & Trondal 2018: 59–60). Coordination between similar units (embedded in the same sector or with shared portfolios) is thus more likely and easier to uphold compared to coordination between dissimilar units.

- *Vertical specialization* refers to the division of labour between different hierarchical levels within or between organizations. It has been demonstrated that leaders generally identify with larger parts of the organization than staff at lower levels, interact more frequently across organizational sub-units, and are exposed to broader streams of information than their subordinates (Egeberg & Trondal 2018: 10). Moreover, studies on national agencies show that inter-organizational vertical specialization leads to agency officials paying significantly less attention to signals from executive politicians than their counterparts in the ministries (Egeberg & Trondal 2018:10, 86; Holst & Gornitzka 2015). Political steering does not disappear, but agency officials tend to allocate more attention to the interests of stakeholders, focus on handling individual cases, experience longer time horizons, and take expert concerns seriously, which creates more autonomy for expert-based

decision-making. Hence, vertical specialization favours agency autonomy vis-à-vis national governments and parent ministries, and it creates leeway for expert concerns rather than national or political concerns. Consequently, how organizations, political systems, and sectors are structured vertically impacts how people behave within these structures.

- *Organizational ownership* is often reflected in the public–private divide, and the basic assumption is that public organizations are owned by the public and formally governed by elected politicians, while private organizations are owned and governed by private investors (Jacobsen & Torsvik 2011: 22). However, this distinction has sparked scholarly debate, such as in Graham Allison's influential article "Public and Private Management: Are They Fundamentally Alike in All Unimportant Respects?" (1983), and Barry Bozeman's book *All Organizations Are Public* (1987). Allison highlights the differences between public and private organizations, while Bozeman argues that all organizations, to some degree, are subject to political authority and influence, and hence the public–private divide is pictured as a continuum wherein differences emerge gradually (Christensen et al. 2010: 15–16). In this thesis, ownership structures are discussed in relation to IOs operating at the global level, and a *public* IO is defined as an organization of member states founded via treaty or transgovernmental agreement (Charnovitz 2011). It thus overlaps with definitions of both IOs, where they are defined as formal organizations with permanent secretariats and three or more states as members (Pevehouse & von Borzyskowsky 2016: 19), and an IGO, defined as "an entity created by treaty, involving two or more nations, to work in good faith, on issues of common interest" (Harvard Law School). A *private* IO is typically an NGO containing members, such as associations or individuals, from more than one country (Charnovitz 2011), and the term NGO applies to any non-state, non-profit, or noncriminal organization, regardless of size and field of work (Davis 2019). Organizational ownership is thus reflected in organizational *membership*, and an important differentiating feature between IGOs and NGOs is that the members of an IGO are states, while members of NGOs are individuals or associations. This overlaps with the concept of 'meta-organizations', where meta-organizations are recognized by having other organizations or states as members, in contrast to organizations with individuals as members (Ahrne & Brunsson 2005; Jönsson 2017: 62). Hence, as meta-organizations, IGOs rely a great deal on their member states, while NGOs are independent of governments and rely on their individual members and donors.

- *Organizational duplication* may refer to both organizations and organizational units which overlap the portfolio of other organizations or organizational units. In general, organizational duplication is often seen as costly and redundant, however studies also indicate that in ministry-

agency relationships, organizational duplication may impact the political attentiveness at the agency level (Egeberg & Trodal 2018: 60 and 93). This thesis suggests that the same type of specialised organizations, operating at the same level and within the same domain, are likely to duplicate each other's portfolios. Duplication of portfolios increase the likelihood of duplication of functions, and functional duplication increases the potential for domain conflicts (Biermann & Harsch 2017: 139). The third article studies expert bodies operating at the global level in the nuclear safety sector. The core components of expert bodies are specialized knowledge coupled to organizational autonomy, and they are targeted toward the expectations of well-informed experts in their field (Boswell 2017: 31). Moreover, expert bodies operate at arm's length from governmental control, at a minimum, and the workforce is characterized by highly educated and skilled experts (Krick & Holst 2020: 1-2).

3.2.3 Application of the variables

In the three articles included in this thesis, all the variables discussed in this section have been used as independent variables, although not all variables in all the papers. The next sections show how the variables have been applied in each paper, what propositions have been made and the relevance of the variables to elucidating the main findings and conclusions of the papers.

In Article 1, the three structural variables of size, horizontal specialization, and vertical specialization are applied to examine governance dynamics within the selected regulatory agency, namely the DSA. Related to organization size, two propositions are used: First, large organizations, in terms of staff size, are more able than smaller organizations to influence subordinated organizations, such as government agencies, and small organizations must, to a greater degree than bigger organizations, build capacity through collaboration and networking. Second, government agencies that are largely dependent on their parent ministries for funding are likely to experience low degrees of autonomy and are generally more closely monitored by the ministry. Furthermore, the paper applies three propositions based on horizontal specialization: First, behavioural patterns follow departmental lines within agencies. Second, the 'governmental model' is likely to dominate in core-state portfolios, whereas the supranational and transnational models are likely to take primacy in non-core portfolios. Third, the DSA is connected to a diverse set of actors that correspond to their own portfolios. Lastly, one proposition is based on vertical specialization: Vertical specialization favours agency autonomy vis-à-vis the parent ministry, creating leeway for expert and supranational concerns, which makes the governmental model less likely. Similarly, personnel in lower ranked positions are more likely to emphasize their role as experts or supranational actors, whereas personnel in higher ranked positions are more likely to emphasize their governmental role. The papers conclude by showing the relevance of the independent variables in three main aspects: variation in ministerial and agency capacity (size), the

technical portfolio of the agency (horizontal specialization), and the vertical specialization of the agency vis-à-vis the ministries that facilitate leeway for expert concerns throughout the agency.

Article 2 applies path dependency, as well as organizational size, horizontal specialization, and vertical specialization as independent variables. Its aim is to examine Nordic cooperation in the nuclear safety sector and investigate why the degree of integration varies between different issues related to this sector. First, the paper proposes that Nordic cooperation is more integrated if the cooperation has been successful in achieving its goals because it leads to positive feedback and self-reinforcing dynamics. Moreover, integrated cooperation is more likely if there is a longstanding history in which critical junctures have strengthened the cooperation. Finally, integration increases if the cooperation has shown robustness toward external changes and shocks. Accordingly, the expectation is that Nordic cooperation in the nuclear safety sector will be more integrated on issues of radiation protection than integration on issues of nuclear safety, security, and safeguards. Second, the largest Nordic authorities in this sector, namely those in Sweden and Finland, will be less integrated into Nordic cooperation than the smaller authorities in Denmark, Norway, and Iceland. Third, based on horizontal specialization, different parts of the national authorities will be involved in Nordic cooperation to different degrees and extents, and the cooperation between the Nordic authorities will therefore be characterized by differentiated integration. Lastly, organizations that are decoupled from the parent ministry will be more likely to engage in Nordic cooperation than organizations embedded in parent ministries or other overarching organizations. The paper concludes by suggesting the importance of path dependency and portfolios: First, positive feedback makes deviation from existing paths less likely, and critical junctures display the robustness of Nordic cooperation when confronted with external shocks and changes. Thus, the longstanding history and success of cooperation on radiation protection and emergency preparedness contributes to explaining why this cooperation upholds its importance. Second, the findings show that Nordic cooperation is differentiated between non-core portfolios and core-state portfolios, and integrated cooperation on core-state portfolios is more difficult to establish and maintain than cooperation on non-core portfolios.

Article 3 uses organization type (as reflected in ownership structures and organizational duplication between specialized organizations), organizational size, and organization birthmarks to explain cooperation and conflicts in inter-organizational relationships at the global level. Six propositions follow: three are related to organization type, two to organization size, and one to organizational birthmarks. First, NGOs will take more initiatives toward giving access to and sharing information with IGOs than the other way around. Second, IGOs are less dependent on resources NGOs hold, compared to NGOs' dependence on IGOs' resources. Third, specialized organizations, such as expert bodies operating within the same domain, are more likely to duplicate each other's functions and

thus trigger domain conflicts. Fourth, small organizations will more actively seek cooperation with big organizations than the obverse. Fifth, big organizations have more capacity to interact with other organizations. Lastly, organizations carry the marks of their initial ideas and resources, and this will impact cooperation and conflicts between organizations. The expectancy is thus that patterns of cooperation and conflicts between organizations observed today will correspond to the ideas and resources available at both the establishments of the organizations and at the establishments of the relationships between them. The paper concludes by showing the relevance of all the variables. First, both organization type and size are important for understanding inter-organizational relationships. However, by combining these two characteristics, a pattern emerges: Big IGOs, which hold political authority, are more autonomous and less vulnerable compared to small NGOs. It is therefore less likely that conflicts will emerge between such organizations because small NGOs will actively adapt to big IGOs to uphold cooperation and remain relevant. However, tensions might develop more easily between small IGOs and small NGOs operating within the same domain when they are dependent on overlapping resources. The data also indicate that expert bodies operating within the same domain more easily duplicate each other's portfolios, which increases the likelihood of domain conflicts. Lastly, the data indicate that organizational birthmarks are important for understanding cooperation and conflict by explaining why tensions are triggered in relationships with a longstanding history of cooperation. The data suggest that potential conflicts between organizations may be held in check as long as important functions related to the birthmarks remain relatively stable. However, when changes occur, the organizations fail to adapt due to the birthmarks they carry, which may in turn trigger tensions that have been a latent part of the inter-organizational relationship from the beginning.

3.3 Concluding thoughts

When Pierson and Skocpol (2002: 706) made the admittedly exaggerated declaration that "we are all institutionalists now", it nevertheless confirmed the pivotal role of institutional theory in political science and the evolution of the field throughout the last decades. From the outset, the new institutionalist scholars critiqued the conceptualization of decision-making individuals as largely autonomous actors making political choices, and the antidote was to focus on the collective, rather than the individual, by asking whether institutions shape behaviour (Peters 2019: 51). Now, studies of political institutions do not ask whether institutions matter, but they ask to what extent, in what respects, through what processes, under what conditions, and why institutions make a difference (Fioretos et al. 2016; March & Olsen 2006: 8).

However, some pose important questions and level critiques at institutional theory, such as whether the approach is going through a mid-life crisis (Alvesson & Spicer 2019). These critics highlight problems in the coherence, packaging, and practice of institutional theory, arguing that messy collections of texts with

broad, vague, and inconsistent definitions make it difficult to grasp a coherent understanding of institutions and institutional theory (Alvesson et al. 2019). To address such problems, institutional theorists must identify and hold on to the heart of the institutionalist project, namely that institutions are the chief object of analysis and how these institutions shape political life (Christensen & Lægreid 2021: 180; Lowndes & Roberts 2013: 199). Moreover, scholars could develop a narrower and more focused conception of institutions and thus limit the range of the concept, sharpen the lens, and problematize the concept (Alvesson & Spicer 2019). This could prevent the spread of sub-varieties of the perspective, which fuels a drift away from the core concepts (Lowndes & Roberts 2013: 199).

One way to 'sharpen the lens' is to distinguish between the different perspectives within the new institutionalism and clarify the properties of each perspective compared to the others. As discussed in this section, there are currently several robust traditions of new institutional analysis, all of which have experienced significant growth in their empirical scope and analytical sophistication (Fioretos et al. 2016). However, the different approaches offer diverse solutions to how we should understand and explain the complexity of the political world (Fioretos et al. 2016), and these differences are rooted in separate perspectives on questions like whether it is rules or norms that constrain individuals, if institutions are changeable or relatively fixed, or if institutions are conceptualized as concrete objects or intangible collections of norms and values (Peters 2019: 236). The main common theme is, however, that all the approaches stress that we might achieve analytical leverage by beginning with institutions, rather than beginning with individuals (Peters 2019: 235). Moreover, the new institutional tradition assumes that politics involves a search for collective purpose, direction, meaning, and belonging, and the approach may therefore offer an important perspective on how political life is organized, how it functions, and how it changes in contemporary democracies (Olsen 2007).

4 Philosophy and methodology

Scholars argue that the interplay between philosophical ideas and empirical work is essential, and if social scientists ignore philosophy, their work is impoverished (Alvesson & Sköldberg 2018: 12; Bevir 2013: 3). This section takes such considerations seriously and discusses the philosophical underpinnings, methods, the data, and cases in this thesis. The section concludes by examining questions of validity and reliability.

4.1 Philosophical underpinnings

The word 'philosophy' basically means "love of wisdom", and the ultimate aim of philosophy is to gain an understanding of reality and acquire knowledge (Ongaro 2020: 6–7). Philosophy thus focuses on some key questions related to 'ontology', which is concerned with "what there is", and 'epistemology' which asks "what do we know" and "how do we know it" (Ongaro 2020: 6). Furthermore, when linking philosophy and science, some questions have remained core, such as how knowledge is related to truth, and how our senses and abstract reasoning relate to knowledge (Nagel 2014).

In the social sciences, a main cleavage formed between positivist and interpretivist positions, and these positions hold contrasting ontologies and epistemologies. The positivist paradigm is constructed on a realist ontology, according to which phenomena exist independently of our knowledge of them, combined with an objective epistemological position. The interpretivist paradigm assumes that reality, or parts of reality, are not naturally given, and the study of how reality is socially constructed is thus essential (Alvesson & Sköldberg 2018: 29; Kühn 2020). In recent years, the middle-ground perspective of 'critical realism' has gained prominence (Thapa & Omland 2018). Critical realism combines 'ontological realism' (reality exists independently) and 'epistemological relativism' (knowledge is socially produced) (Sorrell 2018). Moreover, from a critical realist perspective, the main objective of social scientific research is not to predict or to interpret but to explain − in other words, "to develop empirically supported theories and hypotheses about how, why and under what conditions particular phenomena occur" (Sorrell 2018) (Table 5).

Traditionally, positivism and interpretivism have been associated with different methods: the quantitative positivistic tradition and the qualitative interpretivism tradition. On this basis, a sharp distinction between quantitative and qualitative research has emerged. It basically states that qualitative research is open and explorative, useful for hypothesis formulation and hence inductive, whereas quantitative research is more deductive and closed, and useful for hypothesis testing (Edwards et al. 2014: 3; Jacobsen 2018). The critical realist, however, will argue that she is highly flexible when it comes to method, and in this tradition, there is no tendency to favour one method over another. Hence, critical realism cuts across the line between qualitative and quantitative methods (Alvesson & Sköldberg 2018: 19). This thesis adopts a critical realist position,

and Table 5 summarizes the key characteristics of positivism, critical realism, and interpretivism.

Table 5. Overview of main philosophical positions

	Positivism	**Critical realism**	**Interpretivism**
Ontology	Realist	Realist	Socially constructed
Epistemology	Objective	Inter-subjective	Inter-subjective
Main mode of reasoning	Deductive	Deductive and inductive	Inductive
Main method	Quantitative	No preference	Qualitative
Aim	Predict	Explain	Interpret

Sources: Based on Kühn 2020; Sorrell 2018

4.2 Method, data gathering, and data analysis

Method refers to the techniques with which a researcher gathers data, such as questionnaires, interviews, and observation, and analyzes those data (Pole & Morrison 2003). This thesis is based on qualitative methods, and the data were mainly gathered through semi-structured interviews, which were supplemented with document analysis. The following sections elaborate on how interviews and document analysis were applied in this thesis.

When conducting interviews, the researcher is interested in how informants describe their experiences and how they articulate their choices and actions (Kvale & Brinkman 2017). Moreover, the underlying assumption is that interviews are effective at generating insights into the perceptions, opinions, behaviours, and experiences of the interviewees and that these insights produce knowledge (Buchana et al. 2018). This position is related to phenomenology, which, in social sciences, is a concept that aims to understand social phenomena from interviewees' perspectives and thus describe the world as it appears to them (Kvale & Brinkman 2017). Kvale and Brinkman (2017) describe two different approaches to the interview: the interview as a *research tool* and the interview as a *social practice*. By viewing the interview as a research tool, the researcher assumes that the interview data reflect reality outside the interview. By contrast, if the interview is a social practice, the researcher is mainly focused on the inter-personal dynamics in the interview situation. These differences are apparent in the following metaphor: The interviewer is either a miner or an explorer, and the question is what kind of knowledge the interview is producing; the miner will search for knowledge that already exists (a reality outside the interview), while the explorer will search for knowledge that exists and develops in the relationship between human beings and the world (Kvale & Brinkman 2017: 71–72, 76).

Consequently, a realist ontology is coupled with understanding the interview as a research tool and conducting research as a 'miner', which entails believing that an objective world exists independently of people's perceptions, language,

beliefs, or imagination (Edwards et al. 2014: 2). One important critique of this perspective is linked to the problem of assuming the existence of an objective world without taking into account the social and psychological aspects of human life. The critical realist must thus couple a realist ontology to the recognition that the world consists of subjective interpretations that influence how the world is perceived and experienced (Edwards et al. 2014: 2, 137). Ideally, the critical realist will both search for the best possible explanation of reality and simultaneously be attentive to the interview situation itself.

Document analysis refers to a systematic process for reviewing or evaluating documents, and some scholars suggest that document analysis is particularly relevant to qualitative case studies (e.g., Bowen 2009). Documents comprise text (words) and images that have been recorded without the researcher's interference, and documents arguably improve the researcher's ability to discover insights relevant to the research problem (Bowen 2009). By applying document analysis in addition to the interviews, this thesis utilizes different sources of data. The key advantage of this data *triangulation* is that it may enhance both the validity and the reliability of the findings in a study (Fusch 2018). Hence, findings and conclusions are corroborated, and potential biases are more easily exposed (Bowen 2009).

This thesis benefits from an original dataset based on semi-structured interviews and document analysis. The interview data can be divided into four different datasets. The first set comprises 22 interviews with officials from DSA conducted in 2018 and 2019. The second set supplements the first set by including 15 interviews with officials from all the other Nordic authorities on radiation and nuclear safety. The second dataset thus comprises 37 semi-structured expert interviews with officials from the national authorities on radiation and nuclear safety in Norway, Sweden, Finland, Denmark, and Iceland, also conducted in 2018 and 2019. The third dataset consists of 10 interviews conducted during the fall of 2020 with experts and staff affiliated with UNSCEAR, the ICRP, and the IAEA. Finally, the fourth dataset comprises five interviews conducted during the spring of 2021, with interviewees from both the international level and Nordic level, who had previously been interviewed for the project. Hence, this dataset does not include new interviewees. In sum, the interview data are based on 52 interviews but only 47 individual interviewees.

All the interviews targeted subjects such as contact patterns, perceptions of tasks and roles, and experiences with cooperation and conflicts between the organizations under study. Moreover, all 52 interviews are important for the findings presented in the project; however, the first dataset was utilized in the paper studying the DSA, the first and the second datasets were used in the paper on Nordic cooperation, and all four datasets were employed in the paper on global governance in the nuclear safety sector. Most of the interviews were conducted face to face, except 20 interviews that were conducted via Skype, Lifesize, or Zoom. All interviews were taped and transcribed, and to preserve

their anonymity, each interviewee was assigned an interview code. Drafts of the three papers were sent to all organizations and most of the interviewees, and they were invited to provide comments before publishing. The interview data were supplemented with publicly available documents, such as letters of appropriation, historical documents, and relevant published articles. Both the documents and transcribed interviews were uploaded to the qualitative data analysis software NVivo. NVivo was essential to structuring and systematizing the vast amount of data, and this structuring was crucial to analyzing the data properly. Lastly, the data were collected in accordance with the requirements of the Norwegian Centre for Research Data (NSD).

4.3 Research design and case studies

This thesis is based on an embedded single case study design (Yin 2014: 53–56) in which multiple aspects of a single case were investigated. The design allowed multiple subcases to shed light on the case as a whole and for a complex and in-depth examination of the case under study (Yin 1994: 44). Hence, this thesis investigates a single phenomenon, namely governance processes in the nuclear safety sector, from different angles and at different levels. The separate papers that explore different cases – the DSA, Nordic cooperation, and inter-organizational relationships at the global level – are therefore understood as different pieces of the same picture. Focusing on a single sector or policy field arguably enables some degree of control over noise stemming from other policy sectors and produces a more coherent empirical picture (Martens 2010).

Scholars argue that critical realism is especially well suited as a companion to case studies because critical realism justifies the study of any situation, regardless of the number of research units involved (Easton 2010). Moreover, by evaluating the usage of case studies over the last decades, Yin (2014: xix) argues that recognition of case study research is on the rise. Case studies are nonetheless a fascinating phenomenon in the social sciences: they are highly popular and play an important role in theory development, and yet they are treated with skepticism and disdain (Blatter & Haverland 2012: 1). Most of the skepticism is linked to problems of *generalization*, and the main problem seems to be that one or a few cases are too few to function as an adequately sized sample to represent any larger population (Yin 2014: 40). However, Gerring (2017) argues that case studies must aim to shed light on a larger population of cases, and that they are in fact recognized as having a generalizable element. To solve this problem, Yin (2014) proposes to differentiate between *analytical generalization* and *statistical generalization*. In the latter, inferences are made about a population on the basis of empirical data collected from a sample of the population (or universe), whereas analytical generalization aims at providing empirical light to theoretical concepts and principles (Yin 2014: 40). Consequently, analytical generalization is to go beyond the specific case at hand and generalize to other concrete situations. In this process, the theory and the theoretical propositions used in the study form the groundwork, and the aim is to contribute to abstract theory

building by corroborating, modifying, or rejecting theoretical concepts applied in the case study (Yin 2014: 40–41).

The use of theory is therefore the main vehicle for generalizing findings from a case study (Yin 2014: 45), and this thesis is primarily based on deductive reasoning, where theory and theoretically derived variables are the drivers. Hence, all three articles in this thesis have in common that they corroborate established theoretical perspectives. In addition, Articles 1 and 2 suggest that they represent 'critical cases' or 'least likely' cases where the theoretical perspectives are more rigorously tested. These suggestions are closely linked to the observation that several organizations in the nuclear safety sector are involved in issues related to core-state powers. First, Article 1 argues that the DSA serves as a *least likely* case of multilevel governance by offering a most difficult test (Gerring 2007: 115; Gerring 2017: 103) due to its core-state portfolio. Agency governance is thus likely to be biased toward the governmental model, in which the DSA serves as a ministerial toolkit. The study shows how internal tensions between the governmental and the transnational dynamics are organizationally contingent, as well as how transnational agency governance is prevalent even in portfolios of core-state powers. Second, Article 2 argues that the portfolios of core-state powers are a hard case in which highly integrated Nordic cooperation is less likely than among non-core portfolios. The study finds that the relationship between the Nordic authorities in the nuclear safety sector is characterized by differentiated integration and that it mirrors the division between non-core portfolios and core-state portfolios. Moreover, the data indicate the importance of path dependency and portfolios where integrated cooperation is more challenging to establish and maintain in core-state portfolios.

These theoretical considerations were also important in the case selection process. An embedded case study fits in a single-case design, and there are several rationales for selecting cases in this type of design, such as having a critical, common, unusual, revelatory, or longitudinal case (Yin 2014: 51). As previously mentioned, Articles 1 and 2 have elements of being critical cases where the theory specifies a set of circumstances within which their propositions are believed to be true. The case in Article 3 also presents theoretically derived propositions that corroborate the relevance of the theories utilized. Consequently, the cases in the articles serve as tools to illuminate whether the theoretically derived propositions are likely and facilitate a discussion that challenges, confirms, or extends the theories used in the articles (Yin 2014: 51). Studying governance processes in the nuclear safety sector thus provides an adequate laboratory for testing theoretical propositions derived from new institutional approaches.

4.4 Validity and reliability

The overall quality of research is linked to questions of *validity* and *reliability*. There has been some discussion on whether the terms validity and reliability are

useful when applied to qualitative research outside the positivistic paradigm (Maxwell 2002); however, several scholars do (e.g., Maxwell 2002; Riege 2003; Yin 2014: 45). In this project, the challenges posed by validity are addressed in four main ways. First, the study is based on multiple sources of evidence. Even though the primary data comprised interviews, these interviews were supplemented with documents. Moreover, the interviews themselves also reflect different sources. In Article 1, the interviewees represent all the levels, departments, and sections of the organization. In Article 2, the data are based on interviews with representatives from all the authorities in the five Nordic countries. Likewise, in Article 3, there are interviewees affiliated with all three organizations studied. Second, key interviewees reviewed drafts of all the papers and provided feedback. This ensures a common understanding of the concepts, terms, and operational measures in the papers. Third, the data were structured using NVivo software. This means that all the interviews were recorded and transcribed as accurately as possible, including signs indicating hesitation, pauses, etc. Moreover, using NVivo allowed a categorization and structuring of the data that was of immense help for gaining an overview of the data. It also enabled easy access to the data, which made it more effortless to cross check and test established understandings of the data throughout the process. Lastly, validity was addressed by using theory and theoretically derived propositions to gain analytical generalizations. Reliability was addressed through data triangulation and by making both interview guides (see Appendices C, D, and E) and anonymized transcriptions of the interviews (in accordance with the NSD requirements) available for other researchers.

5 Conclusion and outlook

Over a century has passed since Pierre Curie raised his concerns about the potential harmful effects of radiation, and during this century, our knowledge of the 'secrets of nature' has grown and evolved. Simultaneously, the wickedness of the issues raised by this knowledge, has also been revealed, and now multiple actors across the globe are addressing these complex, border-crossing issues. This thesis investigates governance processes in the nuclear safety sector by studying public administration and formal organizations, as well as inter-organizational relationships and coordination at different levels. Hence, this thesis illuminates how wicked problems related to nuclear safety are addressed, and how Rittle and Webbers (1973) 'argumentative processes' may appear.

Two overarching questions have been essential: how to conceptualize governance processes in the nuclear safety sector, and how organizational history and organizational structures contribute to explaining these processes. Each of the three articles addresses these questions by studying different governance processes at the national, regional, and global levels. A general insight provided by the articles is the existence of transnational governance dynamics in the nuclear safety sector, which imply that the activities in the sector are more than the sum of agreements between national states. Indeed, the articles highlight the essential role of public administration and public organizations situated below the political level nationally, and public and private organizations situated at the global level, in developing standards, regulations and laws related to nuclear safety issues. Moreover, by showing how historical–institutional contexts and endogenous organizational factors contribute to explaining variation in governance processes, this thesis makes a general contribution to new institutionalism and the Scandinavian new institutional approach. More specifically, the main theoretical contributions of this thesis are demonstrated in how the findings corroborate the importance of established theoretical perspectives related to historical institutionalism, organizational birthmarks, and organization theory. Empirically, this thesis contributes by mapping and unpacking important organizations and actors in the nuclear safety sector and by conceptualizing governance processes at different levels.

From a broader perspective, this thesis goes beyond generic macro-oriented theories, or "catch all" theories, that can be applied in all situations, at all times, and that aim to generate universally valid insights for all types of formal organizations (Lægreid 2020: 423). Rather, it applies meso-level theories that highlight the importance of endogenous organizational factors and historical contexts. Moreover, this thesis argues that complex, border-crossing wicked problems necessitate a supplementation of the principal–agent way of thinking, because both public organizations and NGOs are more than subjects to principals. Indeed, such organizations often enjoy considerable amounts of discretion. Therefore, the basic logic of this thesis is as follows: formal organizations are the dominant agents in administrative and political life, and the historical context and organizational structures of formal organizations shape

how these organizations function. Consequently, to understand governance processes, studies on how organizational history and organizational structures matter are important.

List of references

Allison, G. T. (1983). Public and private management: Are they fundamentally alike in all unimportant respects? In J. L. Perry & K. L. Kraemer (Eds.), *Public management: Public and private perspectives.* Mayfield.

Alvesson, M. & Sköldberg, K. (2018). *Reflexive methodology. New vistas for qualitative research* (3rd ed). SAGE Publications Ltd.

Alvesson, M., Hallett, T., & Spicer, A. (2019). Uninhibited institutionalisms. *Journal of Management Inquiry*, *28*(2), 119–127. https://doi.org/10.1177/1056492618822777

Alvesson, M. & Spicer, A. (2019). Neo-institutional theory and organization studies: A mid-life crisis? *Organization Studies*, *40*(2), 199–218. https://doi.org/10.1177/0170840618772610

Ansell, C. & Torfing, J. (2016). Introduction: Theories of governance. In C. Ansell & J. Torfing (Eds.), *Handbook on theories of governance*. Edward Elgar Publishing. https://doi.org/10.4337/9781782548508.00008

Ansell, C., Trondal, J., & Øgård, M. (2017). *Governance in turbulent times*. Oxford University Press.

Ansell, C., Sørensen, E., & Torfing, J. (2020). The COVID-19 pandemic as a game changer for public administration and leadership? The need for robust governance responses to turbulent problems. *Public Management Review*, *23*(7), 949–960. 10.1080/14719037.2020.1820272

Ahrne, G. & Brunsson, N. (2005). Organizations and meta-organizations. *Scandinavian Journal of Management*, *21*(4), 429–449. https://doi.org/10.1016/j.scaman.2005.09.005.

Avant, D., Finnemore, M., & Sell, S. (2010). Who governs the globe? In S. K. Sell, M. Finnemore, & D. Avant (Eds.), *Who governs the globe?* Cambridge University Press.

Barnett, M. N. & Finnemore, M. (2004). *Rules for the world: International organizations in global politics*. Cornell University Press.

Bauer, M. W. & Ege, J. (2016). Bureaucratic autonomy of international organizations' secretariats. *Journal of European Public Policy*, *23*(7), 1019–1037.

Bell, S. R. & Hindmoor, A. M. (2009). *Rethinking governance: The centrality of the state in modern society.* Cambridge University Press.

Bevir, M. (2013). *A theory of governance*. University of California Press. Retrieved from https://escholarship.org/uc/item/2qs2w3rb

Biermann, R. & Harsch, M. (2017). Resource dependence theory. In R. Biermann & J. Koops (Eds.), *Palgrave handbook of inter-organizational relations in world politics*. Palgrave Macmillan.

Biermann, R. & Koops, J. A. (2017). Studying relations among international organizations in world politics: Core concepts and challenges. In R. Biermann & J. Koops (Eds.), *Palgrave handbook of inter-organizational relations in world politics*. Palgrave Macmillan.

Blatter, J. & Haverland, M. (2012). *Designing case studies. Explanatory approaches in small-N research.* Palgrave Macmillian.

Boswell, C. (2017). The role of expert knowledge in international organizations. In A. Littoz-Monnet (Ed.), *The politics of expertise in international organizations*. Routledge

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Boxenbaum, E. & Pedersen, J. S. (2009). Scandinavian institutionalism – A case of institutional work. In T. B. Lawrence, R. Suddaby, & B. Leca (Eds.), *Institutional work: Actors and agency in institutional studies of organizations* (pp. 178–204). Cambridge University Press.

Bozeman, B. (1987). *All organizations are public.* Jossey Bass.

Buchana, Y., Garbutt, M., & Seymour, L. F. (2018). *Identifying micro-level generative mechanisms of ICT-enabled performance improvement in resource-constrained healthcare organisations: A critical realist perspective.* E J Info Sys Dev Countries. e12057. https://doi.org/10.1002/isd2.12057

Charnovitz, S. (2011). Accountability of public and private international organizations. In B. Reinalda (Ed.), *The Ashgate research companion to non-state actors* (pp. 333–346). Ashgate.

Christensen, T. & Lægreid, P. (2009). Living in the past? Change and continuity in the Norwegian central civil service. *Public Administration Review*, *69*(5), 951–961.

Christensen, T., Lægreid, P., Roness, P. G., & Røvik, K. A. (2010). *Organisasjonsteori for offentlig sektor* [Organization theory for the public sector] (2nd ed.). Universitetsforlaget.

Christensen, T. & Lægreid, P. (2018). An organization approach to public administration. In E. Ongaro & S. van Thiel (Eds.), *The Palgrave handbook of public administration and management in Europe* (pp. 1087–1104). Palgrave Macmillan.

Christensen, T. & Lægreid, P. (2021). The logic of appropriateness – A central concept in institutional theory. In C. M. Beckman (Ed.), *Carnegie goes to California: Advancing and celebrating the work of James G. March* (pp. 179–200). Research in the Sociology of organizations, 76. DOI: 10.1108/S0733-558X202176

Collier, R. & Collier, D. (2002). Framework: Critical junctures and historical legacies. In R. Collier & D. Collier (Eds.), *Shaping the political arena: Critical junctures, the labor movement, and regime dynamics in Latin America* (pp. 27–39). University of Notre Dame Press.

Davies, T. (2019). Introducing NGOs and international relations. In T. Davis (Ed.), *Routledge handbook of NGOs and international relations*. Routledge. https://doi.org/10.4324/9781315268927

DiMaggio, P. & Powell, W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147–160. DOI:10.2307/2095101

DiMaggio, P. J. & Powell, W. W. (1991). *The new institutionalism in organizational analysis*. University of Chicago Press.

Djelic, M.-L., & Sahlin-Andersson, K. (2006). Introduction: A world of governance: The rise of transnational regulation. In M.-L. Djelic, & K. Sahlin-Andersson (Eds.), *Transnational governance: Institutional dynamics of regulation*. Cambridge University Press.

Easton, G. (2010). Critical realism in case study research. *Industrial Marketing Management*, *39*(1), 118–128. https://doi.org/10.1016/j.indmarman.2008.06.004

Edwards, P. K., O'Mahoney, J., & Vincent, S. (2014). *Studying organizations using critical realism*. Oxford University Press.

Egeberg, M. (2003). How bureaucratic structure matters: An organizational perspective. In G. Peters & J. Pierre (Eds.), *Handbook of public administration* (pp. 77–87). SAGE.

Egeberg, M. & Trondal, J. (2009). Political leadership and bureaucratic autonomy: Effects of agencification. *Governance*, *22*(4), 673–688.

Egeberg, M., Gornitzka, Å., & Trondal J. (2016). Organization theory. In C. Ansell & J. Torfing (Eds.), *Handbook on theories of governance* (pp. 32–45). Edward Elgar.

Egeberg, M. & Trondal, J. (2017). Researching European Union agencies: What have we learnt (and where do we go from here)? *Journal of Common Market Studies*, *55*(4), 675–690.

Egeberg, M., & Trondal, J. (2018). *An organizational approach to public governance: Understanding and design.* Oxford University Press.

Finnemore, M. (2014). Dynamics of global governance: Building on what we know. *International Studies Quarterly*, *58*(1), 221–224.

Fioretos, K., Falleti, T., & Sheingate, A. (2016). Historical institutionalism in political science. In K. Fioretos, T. Falleti, & A. Sheingate (Eds.), *The Oxford handbook of historical institutionalism*. Oxford University Press. https://doi.org/10.1093/oxfordhb/ 9780199662814.013.1

Fusch, P., Fusch, G. E., & Ness, L. R. (2018). Denzin's paradigm shift: Revisiting triangulation in qualitative research. *Journal of Social Change*, *10*(1), pp. 19–32. DOI: 10.5590/JOSC.2018.10.1.02

Gänzle, S., Leruth, B., & Trondal, J. (2020). Differentiation, differentiated integration and disintegration in a 'post-Brexit-era'. In S. Gänzle, B. Leruth, & J. Trondal (Eds.), *Differentiated integration and disintegration in a post-Brexit era* (pp. 1–25). Routledge.

Genschel, P., & Jachtenfuchs, M. (2014). Introduction: Beyond market regulation. Analysing the European integration of core state powers. In P. Genschel & M. Jachtenfuchs (Eds.), *Beyond the regulatory polity? The European integration of core state powers* (pp. 1–23). Oxford University Press.

Germain, O. & Cabantous, L. (2013). Introduction: Special symposium "Carnegie School and organization studies". *European Management Journal*, *31*(1), pp. 67–71.

Gerring, J (2007) *Case study research*. Cambridge University Press.

Gerring, J (2017) *Case study research* (2nd ed.). Cambridge: Cambridge University Press.

Gornitzka, Å. & Sverdrup, U. (2011). Access of experts: Information and EU decision-making. *West European Politics*, *34*(1), 48–70.

Gulick, L. (1937). Notes on the theory of organization. *Classics of organization*

theory, *3*, 87–95.

Hale, T. & Held, D. (2011). Editors' Introduction: Mapping Changes in Transnational Governance. In T. Hale & D. Held (eds.) *Handbook of transnational governance: Institutions and innovations*, pp. 1-36. Polity Press.

Hall, P. A. & Taylor, R. C. R. (1996). Political science and the three new institutionalisms. *Political Studies*, *44*(5), 936–57. https://doi.org/10.1111/j.1467-9248.1996.tb00343.x.

Harvard Law School. (n.d.). *Intergovernmental organizations (IGOs)*. Harvard Law School. https://hls.harvard.edu/dept/opia/what-is-public-interest-law/public-service-practice-settings/public-international-law/intergovernmental-organizations-igos/

Haveman, H. A. & Wetts, R. (2019). Organizational theory: From classical sociology to the 1970s. *Sociology Compass*, *13*(3). https://doi.org/10.1111/soc4.12627

Head B. W. (2019). Forty years of wicked problems literature: Forging closer links to policy studies. *Policy and Society*, *38*(2), 180–197. DOI: 10.1080/14494035.2018.1488797

Holst, C. & Gornitzka, Å. (2015). The expert-executive nexus in the EU: An introduction. *Politics and Governance*, *3*(1), 1–12.

Immergut, E. M. (1998). The theoretical core of the new institutionalism. *Politics and Society*, *26*(1), 5–34. https://doi.org/10.1177/0032329298026001002

Ishiyama, J. T. & Breuning, M. (2014). Neo institutionalism. In *Encyclopedia Britannica*. https://www.britannica.com/topic/neoinstitutionalism

Jacobsen, D. I. & Torsvik, J. (2011). *Hvordan organisasjoner fungerer* [How organizations function] (3rd ed.). Fagbokforlaget.

Jacobsen, D. I. (2017). Governance at the local level: A research agenda on cross-boundary coordination. In J. Trondal (Ed.), *The rise of common political order* (pp. 197–216). Edward Elgar Publishing.

Jacobsen, D. I. (2018). The logic of quantitative research. Lecture in "Researching Social Science" at the University of Agder October 30th 2018

Jacobsson, B. & Sahlin-Andersson, K. (2006). Dynamics of soft regulations. In M. L. Djelic & K. Sahlin-Andersson (Eds.), *Transnational governance: Institutional dynamics of regulation* (pp. 247–267). Cambridge University Press.

Jessop, B. (2013). Hollowing out the "nation-state" and multi-level governance. In P. Kennett (Ed.), *A handbook of comparative social policy* (2nd ed., pp. 11–26). Edward Elgar.

Jönsson, C. (2017). IR paradigms and inter-organizational theory: Situating the research program within the discipline. In R. Biermann & J. A. Koops (Eds.), *Palgrave handbook of inter-organizational relations in world politics*. Palgrave Macmillan.

Karns, M., Mingst, K., & Stiles, K. (2015). *International organizations: The politics and processes of global governance* (3rd ed.). Lynne Rienner.

Keohane, R., & Nye, J. (1974). Transgovernmental relations and international organizations. *World Politics*, *27*(1), 39–62. DOI:10.2307/2009925

Koop, C. & Lodge, M. (2017). What is regulation? An interdisciplinary concept analysis. *Regulation and Governance*, *11*(1), 95–108.

Kjær, A. M. (2011). Rhodes' contribution to governance theory: Praise, criticism and the future governance debate. *Public Administration*, *89*(1), 101–113. DOI: 10.1111/j.1467-9299.2011.01903.x

Krick, E., & Holst, C. (2020). The socio-political ties of expert bodies: How to reconcile the independence requirements of reliable expertise and the responsiveness requirement of democratic governance. In E. Krick & C. Holst (Eds.), *Experts and democratic legitimacy: Tracing the social ties of expert bodies in Europe*. Routledge.

Kühn, N. S. B. (2020). *Ever closer administrative institutions? Impacts of the European Union on national decision-making processes* [Ph.D. thesis]. University of Agder.

Kvale, S. & Svend B. (2017). Det kvalitative forskningsintervju (The qualitative research interview). Third edition. Gyldendal Norske Forlag. Oslo

Legrand, T. (2019). Sovereignty renewed. Transgovernmental policy networks and the global–local dilemma. In D. Stone & K. Moloney (Eds), *The Oxford handbook of global policy and transnational administration*. Oxford University Press.

Levi-Faur, D. (2011) Regulation and regulatory governance. In D. Levi-Faur (Ed.), *Handbook on the politics of regulation* (pp. 3–24). Edward Elgar.

Levi-Faur, D. (2012). *Oxford handbook of governance*. Oxford University Press.

Levin, K., Cashore, B., & Bernstein, S. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, *45*, 123–152. https://doi.org/10.1007/s11077-012-9151-0

Lowndes, V. & Roberts, D. (2013). *Why institutions matter*. *The new institutionalism in political science.* Palgrave Macmillian.

Lægreid, P. & Rykkja, L. (2015). Organizing for "wicked problems": Analyzing coordination arrangements in two policy areas. *International Journal of Public Sector Management*, *28*(6), 475–493.

Lægreid, P. (2020). Public administration research in Norway: An organisational and institutional approach to political organisations. In G. Bouckaert & W. Jann (Eds.), *European perspectives for public administration* (pp. 421–438). Leuven University Press.

Majone, G. (1996). Regulation and its modes. In G. Majone (Ed.), *Regulating Europe* (pp. 9–27). Routledge.

March, J. & Olsen, J. (1984). The new institutionalism: Organizational factors in political life. *American Political Science Review*, *78*(3), 734–749.

March, J. & Olsen, J. P. (1989). Rediscovering institutions: The organizational basis of political life. The Free Press.

March, J. & Olsen, J. P. (2006). Elaborating the "new institutionalism". In R. A. W. Rhodes, S. A. Binder, & B. A. Rockman (Eds.), *The Oxford handbook of political institutions* (pp. XVII, 816). Oxford University Press. https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199548460.001.0001/oxfordhb-9780199548460-e-1

Marcussen, M. & Trondal, J. (2011). The OECD civil servant: Caught between Scylla and Charybdis. *Review of International Political Economy*, *18*(5), 592–621.

Marquis, C. & Tilcsik, A. (2013). Imprinting: Toward a multilevel theory. *Annals*, *7*, 195–245. https://doi.org/10.5465/19416520.2013.766076

Martens, M. (2010). *Organized administrative integration. The role of agencies in the European administrative system*. [Ph.D. thesis]. Oslo: ARENA.

Maxwell, J. A. (2002). Understanding and validity in qualitative research. In A. M. Huberman & M. B. Miles (Eds.), *The qualitative research companion*. Sage.

Molenveld, A., Verhoest, K., Voets, J., & Steen, T. (2020). Images of coordination: How implementing organizations perceive coordination arrangements. *Public Administration Review*, *80*(1), 9–22.

Morgan, G. (2006). Transnational actors, transnational institutions, transnational spaces: The role of law firms in the internationalization of competition regulation. In M.-L. Djelic, & K. Sahlin-Andersson (Eds.), *Transnational governance: Institutional dynamics of regulation*. Cambridge University Press.

Nagel, J. (2014). *Knowledge: A very short introduction.* Oxford University Press.

Olsen, J. P. (1991) Political science and organization theory: Parallel agendas but mutual disregard. In R. M. Czada & A. Windhoff-Héritier (Eds.), *Political choice. Institutions, rules and the limits of rationality* (pp. 87–119). Frankfurt am Main: Campus.

Olsen, J. P. (2006). Maybe it is time to rediscover bureaucracy. *Journal of Public Administration Research and Theory*, *16*(1), 1–24.

Olsen, J. P. (2007). Organization theory, public administration, democratic governance. Working paper No.1, January 2007. ARENA. https://www.sv.uio.no/arena/english/research/publications/arena-working-papers/2001-2010/2007/wp07_01.pdf

Olsen, J. P. (2018a). The Bergen approach to public administration and political organization. *Norsk Statsvitenskapelig Tidsskrift*, *34*(4), 188–206.

Olsen, J. P. (2018b). Democratic accountability and the changing European political order. *European Law Journal*, *24*, 77–98. https://doi.org/10.1111/eulj.12261

Ongaro, E. (2020). *Philosophy and public administration.* Edward Elgar Publishing.

Peters, B. G. & Pierre, J. (1998). Governance without government? Rethinking public administration, *Journal of Public Administration Research and Theory*, *8*(2), 223–243. https://doi.org/10.1093/oxfordjournals.jpart.a024379

Peters, B. G. (2012). Governance as political theory. In D. Levi-Faur (Ed.), *Oxford handbook of governance*. Oxford University Press.

Peters B. G. (2017). What is so wicked about wicked problems? A conceptual analysis and a research program. *Policy and Society*, *36*(3), 385–396. DOI: 10.1080/14494035.2017.1361633

Peters, B. G. (2018). The challenge of policy coordination. *Policy Design and Practice*, *1*(1), 1–11. DOI: https://doi.org/10.1080/25741292.2018.1437946

Peters, B. G. (2019). *Institutional theory in political science: The new institutionalism* (4th ed.). Edward Elgar Publishing.

Pevehouse, J. & von Borzyskowsky, I. (2016). International organizations in world politics. In J. K. Cogan, I. Hurd, & I. Johnstone (Eds.), *The Oxford handbook of international organizations* (pp. 3–32). Oxford University Press.

Pierre, J. & Peters, B. G. (2020). Governance, Politics and the State (2nd ed.). Macmillan Education UK.

Pierson, P. (2000). Increasing returns, path dependence, and the study of politics. *The American Political Science Review*, *94*(2), 251–267.

Pierson, P. & Skocpol, T. (2002). Historical institutionalism in contemporary political science. In I. Katznelson & H. V. Miller (Eds.), Political science. State of the discipline (pp. 693–721). Norton.

Pole, C. & Morrison, M. (2003). *Ethnography for education*. Retrieved from https://ebookcentral.proquest.com

Raadschelders, J. (2011). *Public administration: The interdisciplinary study of government*. Oxford University Press.

Raadschelders, J. C. N. & Verheijen, T. (2019). Globalization and internationalization. In D. Stone & K. Moloney (Eds.), *The Oxford handbook of global policy and transnational administration*. Oxford University Press.

Reed A. M. (2011). The history of radiation use in medicine. *Journal of Vascular Surgery*, *53*(1), 3S–5S. https://doi.org/10.1016/j.jvs.2010.07.024

Reinalda, B. (2013). International organization as a field of research from 1910. In B. Reinalda (Ed.), *Routledge handbook of international organization* (pp. 1–24). Taylor & Francis Group.

Riege, A. M. (2003). Validity and reliability tests in case study research: A literature review with "hands-on" applications for each research phase. *Qualitative Market Research*, *6*(2), pp. 75–86. https://doi.org/10.1108/13522750310470055

Rittel, H. W. J. & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, *4*, 155–169. https://doi.org/10.1007/BF01405730

Rhodes, R. A. W. (2007). Understanding governance: Ten years on. *Organization Studies*, *28*(8), 1243–1264. https://doi.org/10.1177/0170840607076586)

Ruggie, J. G. (1998). Constructing the world polity (The new international relations series). Routledge.

Sanders, E. (2006). Historical institutionalism. In R. Rhodes, S. Binder, & B. Rockman (Eds.), *The Oxford handbook of political institutions* (pp. 39–55). Oxford University Press.

Scharpf, F. (1977). Does organization matter? Task structure and interaction in the ministerial bureaucracy. In E, Burack and A. Negandhi (Eds.), *Organization Design* (pp. 149–167). Kent State University Press.

Schmidt, V. A. (2008). Discursive institutionalism: The explanatory power of ideas and discourse. *Annual Review of Political Science*, *11*(1), 303–326.

Schneiker, A. (2017). NGO–NGO relations. In R. Biermann & J. Koops (Eds.). *Palgrave handbook of inter-organizational relations in world politics*. Palgrave Macmillan.

Schreyögg, G. & Sydow, J. (2011). Organizational path dependence: A process view. *Organization Studies*, *32*(3), 321–335. https://doi.org/10.1177/0170840610397481

Scott, W. R. (2008). *Institutions and organizations: Ideas and interests* (3rd ed.). Sage Publications.

Scott, W. R & Davis, G. F. (2016). *Organizations and organizing: Rational, natural and open systems perspectives*. Routledge.

Seabrook, L. & Henriksen, L. F. (2017). Issue control in transnational professional and organizational networks. In L. Seabrook & L. F. Henriksen (Eds.), *Professional networks in transnational governance*. Cambridge University Press.

Selznick, P. (1957). *Leadership in administration*. University of California Press.

Simon, H. A. (1957). *Administrative behavior: A study of decision making processes in administrative organization.* Macmillan.

Sorrell, S. (2018). Explaining sociotechnical transitions: A critical realist perspective. *Research Policy*, *47*(7), 1267–1282.

Slaughter, A. (2004). *A new world order*. Princeton University Press.

Steffek, J. (2013). Explaining cooperation between IGOs and NGOs – Push factors, pull factors, and the policy cycle. *Review of International Studies*, *39*(4), 993–1013. DOI: 10.1017/S0260210512000393

Steinmo, S. (2008). Historical institutionalism. In D. Della Porta & M. Keating (Eds.), *Approaches and methodologies in the social sciences: A pluralist perspective* (pp. 118–138). Cambridge University Press.

Stinchcombe, A. L. (1965). Social structure and organizations. In J. G. March (Ed.), *Handbook of organizations* (pp. 142–193). Rand McNally & Co.

Stone, D. & Ladi, S. (2015). Global public policy and transnational administration. *Public Administration*, *93*(4), 839–855. https://doi.org/10.1111/padm.12207

Tallberg, J., Sommerer, T., & Squatrito, T. (2013). *The opening up of international organizations: Transnational access in global governance.* Cambridge University Press.

Trondal, J., Van Den Berg, C., & Suvarierol, S. (2008). The compound machinery of government: The case of seconded officials in the European Commission, *Governance*, *21*(2), 253–274.

Trondal, J. & Bauer, M. (2017). Conceptualizing the European multilevel administrative order: Capturing variation in the European administrative system. *European Political Science Review*, *9*(1), 73–94.

Trondal, J. & Stie, A. E. (2020). *Introducing the study of Nordic cooperation*. *Politics and Governance*, *8*(4). https://doi.org/10.17645/pag.v8i4.3726

Thapa, D. & Hans, O. O. (2018). Four steps to identify mechanisms of ICT4D: A critical realism-based methodology. *Electronic Journal of Information Systems in Developing Countries*, *84*(6), n/a-n/a.

Thelen, K. (1999). Historical institutionalism in comparative politics. *Annual Review of Political Science*, *2*(1), 369–404.

Thelen, K. A. & Mahoney, J. (2010). A theory of gradual institutional change. In K. A. Thelen & J. Mahoney (Eds.), *Explaining institutional change: Ambiguity, agency, and power* (pp. 1–37). Cambridge University Press.

Turnbull, N. & Hoppe, R. (2019). Problematizing 'wickedness': A critique of the wicked problems concept, from philosophy to practice. *Policy and Society*, *38*(2), 315–337, DOI: 10.1080/14494035.2018.1488796

Yin, R. K. (2014). *Case study research. Design and methods* (5th ed.). Sage Publications.

Van Thiel, S. & Yesilkagit, K. (2014). Does task matter? The effect of task on the establishment, autonomy and control of semi-autonomous agencies. *International Review of Administrative Sciences*, *80*(2), 318–340.

Verhoest, K., Peters, B. G., Bouckaert, G. & Verschuere, B. (2004). The study of organisational autonomy: a conceptual review. *Public Administration and Development*, *24*, 101–118.

Verhoest, K. & Bouckaert, G. (2005). Machinery of government and policy capacity: The effects of specialization and coordination. In M. Painter & J. Pierre (Eds.), *Challenges to state policy capacity: Global trends and comparative perspectives* (pp. 92–111). Palgrave Macmillan.

Weiss, T. G. & Wilkinson, R. (2018). From international organization to global governance. In T. G. Weiss & R. Wilkinson (Eds.), *International organization and global governance* (2nd ed., pp.1–20). Routledge.

Part two: The articles

Kjøndal, K. & Trondal, J. (2021). Dynamics of agency governance. Evidence from the Norwegian Radiation and Nuclear Safety Authority. *Public Policy and Administration*. Doi: 10.1177/09520767211019575.

Kjøndal, K. (2020). Nordic Cooperation in the Nuclear Safety Sector: High, Low, or Differentiated Integration? *Politics and Governance,* 8(4). Doi: https://doi.org/10.17645/pag.v8i4.3292

Kjøndal, K. (2021). Global governance and inter-organizational relationships in the nuclear safety sector. *Global Public Policy and Governance.* Doi: https://doi.org/10.1007/s43508-021-00028-5

Article 1: Dynamics of agency Governance. Evidence from The Norwegian Radiation and Nuclear Safety Authority

Abstract

Public organizations are compound bodies characterized by competing *endogenous* dynamics of governance. This study makes two main contributions. First, it contributes to an organizational approach to studies of public policy and administration by conceptualizing compound agency governance, and secondly by determining how variation in agency governance reflects endogenous organizational factors. Based on a study of the Norwegian Radiation and Nuclear Safety Authority (DSA), two observations are highlighted: Firstly, DSA staff are torn between two competing behavioural logics: A governmental and a transnational logic. Moreover, portfolios of core state powers are more closely monitored by parent ministries than portfolios that relate to non-core state powers. Secondly, the study suggests that organizational factors are vital determinants in balancing behavioral logics in agency governance.

Key words: Agency governance, core state powers, institutionalism, nuclear safety, radiation protection, organization theory

Introduction

Formulating and implementing public policy is a prerogative for national governments and administrations. Moreover, the capacity of the regulatory state to govern has largely been determined by 'the [administrative] capacity of the state to effectively achieve the chosen policy outcomes' (Matthews 2012: 281). This study makes two wider contributions. First, it contributes to an organizational approach to studies of public policy and administration by conceptualizing compound agency governance, and secondly by determining how variation in agency governance reflects endogenous organizational factors. The study suggests how endogenous tensions of agency governance between a ´governmental model´ and a ´transnational model´ is organizationally contingent and how transnational agency governance is prevalent even in portfolios of core state powers. Agency governance is thus shown to be profoundly compound. The key to understand compound bureaucracy is that governing institutions are likely to mobilize a multidimensional set of conflicting roles and identities that actors may attend to and act upon (Marcussen and Trondal 2011).

Examining governance dynamics within one selected regulatory agency, this study makes contributions to three sets of literature. First, it contributes to studies of regulation. Majone (1994) suggests that administrative regulation – regulation by agencies operating at arm's length from direct regulatory oversight by the government - is a frontier in our understanding of public policy and administration. Reliance on regulation will thus characterise the regulatory state,

suggesting that the regulatory role of the state is more important than other state functions (Majone 1994; Majone 1996: 55). This is highlighted by the growth of governmental rule-making and regulatory agencies (Majone 1994; Levi-Faur 2011:12; Vibert 2014: 14). Consequently, the regulatory state suggests a transformation of the nation-state and the way states control and influence the activities of regulatory actors. Studies have been particularly interested in understanding the relationship between the scope of state authority and the role of regulatory bodies (Levi-Faur 2011: 3 and 5) and empirical data suggests an intimate relationship between regulation and the role of government agencies (Koop and Lodge 2017; Levi-Faur 2011: 5; Majone 1996: 9). Furthermore, scholars have argued that the regulatory state is increasingly embedded in complex webs of non-state actors and that their *modus operandi* is difficult to disentangle from other relevant actors (Djelic and Sahlin-Andersson 2006: 9). Our study contributes to studies of the regulatory state by showing how *endogenous tensions* of agency governance is organizationally contingent and how expertise-based transnational agency governance is prevalent even in portfolios of core state powers.

Secondly, this paper contributes to an *organizational turn* in studies of public policy and administration both by conceptualizing the compound nature of agency governance and illuminating how it reflects endogenous institutional factors (Egeberg and Trondal 2018). The organizational ´school´ argues that institutions play a partly autonomous role in political life. Institutions are markers of a polity's character, visions and history and it makes a difference how they are organized (Egeberg and Trondal 2018; Olsen 2007: 3). An organizational approach aspires to understand politics as a consequence of both competing and shared rules and roles in administrative systems (Marcussen and Trondal 2011). This approach has furthermore become key to studies of public administration and public governance in organized democracies (Egeberg and Trondal 2009; Trondal et al. 2010; Olsen 2006). This study shows how organizational factors contribute to make regulatory agencies compound institutions and thus far more than merely technical-neutral tools for efficient governance.

Third, this study contributes to literatures on multilevel administrative governance (MLA) in the European Union (EU). Studies of MLA suggests that agencies in the EU have become multi-hatted by playing important roles not only for national governments but also for the European Commission, EU agencies and regulatory networks (Egeberg and Trondal 2017; Martinsen et al. 2019) where institutions at different levels of government are linked together in the performance of tasks (Trondal and Bauer 2017). This study contributes to this literature by focusing on variation in *endogenous* governance patterns inside regulatory agencies. Focusing on intra-agency variation makes it possible to capture detailed variations in patterns of agency governance that remain invisible if agencies are treated as coherent wholes. In particular, this paper is interested in understanding how agency governance is affected by portfolio variation. In order

to test the effect of portfolio, this study compare agency sub-units (sections) that are engaged in dossiers related to ´core state´ and ´non-core state´ dossiers (Genschel and Jachtenfuchs 2014).

Zooming into the interior of regulatory agencies, this study offers a micro-level lens by mapping variation in behavioural dynamics among agency staff inside one agency: the Norwegian Radiation and Nuclear Safety Authority (DSA). The DSA is the governmental authority and expert organisation in dossiers concerning radiation protection, nuclear safety, security, and safeguards, and they have international tasks related to the promotion of radiation protection, nuclear security, nuclear safety, disarmament, and non-proliferation. The DSA is thus part of the nuclear safety sector, including issues of safety, security, and safeguards[2], and the agency serves as a *least likely* case of multilevel governance by offering a most-difficult test (Gerring 2007:115; Gerring 2017:103): As partly a ´core state´ portfolio, agency governance is likely to be biased towards a governmental model in which the agency serves as a ministerial toolkit.

In literatures on the regulation of nuclear power, the role of the *regulator* has been a core theme, often sparked by crises. Important examples are the Three Mile Island Accident and the Fukushima accident, where regulators were criticised for having dual roles and lacking autonomy toward governments and the industry. Moreover, critics argue that reforms undertaken may have had little impact on the quality of decision-making and on the safety of the nuclear reactors (Funabashi and Kitazawa 2012; Kemeny 1979; Temples 1982; Wang and Chen 2012; Wang, Chen and Yi-chong 2013). Scholars have also discussed the role of experts in the nuclear energy policy system, highlighting the importance of their independence while also showing their dual loyalties (Gilinsky 1992; Massey 1986). In the case of Norway, history shows that discussions about building nuclear power plants during the 1970s, never materialized due to the Parliament´s decision to expand and pursue hydropower. However, Norway proved to be a forerunner by building a research reactor as early as 1951, and the total number of research reactors in the country has remained four (Hofstad 2019).

The paper proceeds as follows. The first section outlines a theoretical framework in two steps: First, three conceptual models are presented to map variation in agency governance. Secondly, independent variables that might account for such variation are outlined. The following two sections briefly introduces the methodology and data, and present empirical findings in three steps that relate to

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[2] Safety: the protection of people, environment, and society from the consequences of radiation, through emergency preparedness, radiation protection and nuclear safety (how to manage nuclear facilities to avoid accidents). Safeguards: making sure that nuclear material, technology, and information is used for peaceful purposes. Security: protecting nuclear facilities from terrorism and protecting nuclear material, technology, and information from stealing.

three ideal typical models. The concluding section summarizes key findings and implications to the literature.

A two-step theoretical framework

The theoretical framework is presented in two parts. Part one draws on the above observation and outlines a conceptual map of three ideal-typical conceptual governance dynamics (Table 1): A governmental, a supranational, and a transnational dynamic. Agencies are thus pictured as compound institutions with inbuild behavioural inconsistencies. Part two presents an organizational approach and derives a set of independent variables that are likely to bias agency governance towards either of the conceptual dynamics.

Conceptual maps

The classic literature on state-building has demonstrated how the extortion of administrative capacities of the state involves delicate balancing acts between creating action capacities for the standardization and the penetration of the territory and concerns for local autonomy (Rokkan 1999). Centralising core state power through capacity building is seen as one vital ingredient of state-formation, also in nascent federal states (Bartolini 2005). Quite similarly, contemporary studies of expert bodies suggest that public organizations harbour competing dynamics and multiple tensions, e.g. between de-politization and politization (Krick and Holst 2019). This section outlines three models of agency governance. These dynamics derives from contemporary studies of international public administration (IPA) and are conceptualized as *complementary* dynamics (Marcussen and Trondal 2011; Trondal et al. 2010; Trondal 2016). In effect, different dynamics of agency governance might be prevalent in different agency departments and sections, albeit under different conditions.

A governmental model characterizes government agencies as subordinated to parent ministries. Tasks, responsibilities, and resources are allocated from the parent ministry and are likely to bias regulatory behaviour among agencies (Egeberg and Trondal 2017). Agencies are seen as regulatory bodies that monitor compliance with rules, conduct inspections, audit, and evaluate (Christensen and Lægreid 2007; Lægreid et.al 2008; Kjaer and Vetterlein 2018). Subsequently, agency officials are likely to enjoy limited autonomy in their daily work (Lægreid et al. 2008) and engage frequently with their parent ministry. Accordingly, steering signals and mandates that originate from national parent ministries are vital to the agency, there will be liaisons and revolving doors in personnel between the two as well as duplication of tasks. Consequently, role perceptions and loyalties among agency personnel are likely to be directed towards the governmental-level institutions generally and the parent ministry in particular.

A supranational model characterises government agencies as being closely aligned to supranational institutions and relatively loosely coupled to national parent ministries. Agency autonomy is thus low vis-à-vis supranational institutions. Agencies are seen as 'instruments of centralization' of regulatory functions at the international level and for uniform implementation at the national level (Egeberg and Trondal 2017). Consequently, one might expect domestic agencies to evoke tasks beyond the international exchange of best practices and information, and embrace tasks related to EU regulatory governance, policy making and implementation. We might also expect that the employees' role-perceptions and loyalties are geared toward supranational rather than national institutions. This model is thus likely to favour steering signals originating from supranational institutions.

Finally, *a transnational model* assumes that agencies are loosely coupled to parent ministries *and* supranational institutions. Agencies enjoy large degrees of discretion based on their expertise and skills, and they are not mere instruments in the hands of the political leadership. Hence, they "are 'floating in-between' levels of governance", making steering and accountability arrangements towards *any* particular level of governance ambiguous (Egeberg and Trondal 2017). Agencies are strongly connected to transnational epistemic communities consisting of networks of professionals with recognized expertise and policy-relevant knowledge in a domain (Haas 1992: 3; Cross 2013). Agency governance is thus biased by internal and external professional reference groups. The agency is assumed to argue and negotiate based on their professional competences and to legitimate their authority on scientific competences. Hence, the agency legitimacy builds on technocratic values and the prominence of particular expertise. Their behaviour is guided by considerations of scientific and professional correctness (Trondal et al. 2010: 14). Their role perceptions and loyalties are primarily directed towards their expertise and educational background, as well as toward epistemic communities. The assumption is that the agency is characterized by 'best practices' and information exchange, rather than regulatory governance (Egeberg and Trondal 2017). Table 1 summarizes the three conceptual models and suggests proxies for empirical analysis.

Table 1. A conceptual map of compound agency governance

	Governmental model	*Supranational model*	*Transnational model*
Degree of autonomy	Low*	Low**	High***
Provider of premises	Parent ministry	Supranational institutions	Epistemic communities
Core tasks	Domestic regulatory governance	EU regulatory governance	Knowledge production and knowledge exchange
Role perception	National civil servant	Supranational civil servant	Independent expert
Loyalty	To national-level institutions	To supranational institutions	To epistemic communities

* Towards national ministries
** Towards supranational institutions
***Towards both supranational institutions and national ministries

An organizational approach

According to the institutionalist school in the social sciences, institutional factors might intervene and bias governance processes. The basic building blocks of institutions are rules, and rules are linked together and sustained through identities, senses of membership in groups and recognitions of roles (March and Olsen 2006: 8). Scholars of the institutional logics' perspective underscore that to understand individual and organizational behaviour, focus should be on how social contexts both enables and constrains behaviour (Thornton and Ocasio 2008: 101-102). This perspective thus speaks to questions of how individual and organizational actors are influenced by their contexts in multiple social locations in institutional systems, and it highlights that different institutional orders of the inter-institutional system distinguishes unique organizing principles and practices that may influence individual and organizational behaviour (Thornton et al. 2012: 2). Consequently, actors´ behaviour is nested within organizations and institutions, and dominant institutional logics become taken for granted by the establishment of core principles for organizing activities and channelling resources and attention (Thornton et al. 2012: 76-77). Furthermore, members of an organization tend to become permeated not only with their identities as belonging to the organization but also with the various identities associated with various roles in the organization (March and Olsen 2006: 9).

However, whereas all institutions are organizations, not all organizations are institutions. Organizations consist of those sets of codified rules and routines that may guide the behaviour of actors (Egeberg and Trondal 2018). This paper derives testable hypotheses from this narrower organizational approach. One reason, as highlighted below, is that the organizational approach might be applied practically as a design approach in public policy and administration.

Organizations temporarily settle issues about 'tasks, authority, power, and accountability' (Olsen 2010: 37), and organization structure specifies who is expected to do what, and how they are to do it. Different dimensions of the organizational structure enable varied insights into *how* structure affect individual behaviour (Egeberg and Trondal 2018: 6-7). Organizational structure is thus a powerful *design instrument* for approaching public governance because organizational factors are expected to create biases in governance processes, making some choices more likely than others (Egeberg and Trondal 2018: 1-4). Formal rules are likely to systematically bias the decision-making behaviour of civil servants, ultimately biasing the formulation and execution of public policy (Barnett and Finnemore 2004: 3). The following outlines three structural variables: Size, horizontal specialization, and vertical specialization:

The *size (#1)* of an agency indicates the capacity to initiate policies, develop alternatives, implement decisions, and monitor compliance. Studies show that the number of ministerial *staff* available for monitoring and steering agency activities influence the extent to which agency personnel allocate attention to political signals from their respective ministries (Egeberg and Trondal 2018: 86). A proposition related to size is thus that large organizations, in terms of staff size, are more able than smaller organizations to influence subordinated organizations, such as government agencies, and small organizations must, to a greater degree than bigger organizations, build capacity through collaboration and networking. In addition to staff size, *budgetary size* also supply capacity for organizations to act. Studies suggest that if an agency largely depends on the government for its funding, its capacity for autonomy is constrained (Verhoest et al. 2004; Van Thiel and Yesilkagit 2014). The proposition is therefore that government agencies that are largely dependent on their parent ministries for funding are likely to be closely monitored by the ministry. The general proposition is thus that agency size is positively associated with the governmental model.

Horizontal specialization (#2) of agencies is likely to influence the division of labour and subsequent coordination between agency sub-units, making coordination across departmental sub-units more challenging than coordination within them. Studies show that horizontal specialization by purpose (sector) bias decision-making behaviour toward a logic where preferences, contact patterns, loyalties and roles are directed towards policy sub-systems and portfolios (Egeberg and Trondal 2018: 59-60). The proposition is thus that behavioural patterns follow departmental lines within agencies. Horizontal specialization is moreover likely to influence the *division of portfolios* inside agencies. Moreover, the portfolio of the DSA may be further sub-divided into two conceptual sub-frames:

- A first frame disaggregates the DSA into core state portfolios vs. non-core portfolios. ´Core state powers´ is defined by their ´institutional significance for state-building´ which include foreign and defence policy, public finances, public administration, and the maintenance of law and

order (Genschel and Jachtenfuchs 2014: 1). Core state powers in the DSA involve portfolios connected to foreign and defence policy like nuclear security, safeguards, and the direct involvement in other countries. The proposition is thus that the ´governmental model´ is likely to dominate in core state portfolios, whereas the supranational and transnational models are likely to take primacy in non-core portfolios.

- A second frame disaggregates the DSA into three policy sub-systems or portfolios: safety, including both nuclear safety, radiation protection, and emergency preparedness, nuclear security, and safeguards. Different parts of the DSA are likely to relate to different institutions conditioned on their portfolio, making it difficult to single out one actor as the most important. The portfolios also demand specific expertise, and a general prediction is thus that agency staff is biased toward epistemic communities. Hence, the proposition is that the DSA is connected to a diverse set of actors that correspond to their own policy sub-system or portfolio.

Vertical specialization (#3) refers to the division of labour between different hierarchical levels within or between organizations. It has been demonstrated that leaders generally identify with larger parts of the organization than staff at lower levels, they interact more frequently across organizational sub-units and they are exposed to broader streams of information than their subordinates (Egeberg and Trondal 2018: 10). Studies also show that vertical inter-organizational specialization leads to agency officials paying significantly less attention to signals from executive politicians than their counterparts in the ministries. Political steering does not disappear, however, but studies suggest that agency officials in general allocate more attention to the interest of stakeholders, focus on handling of individual cases, experience longer time horizons, and they take expert-concerns seriously – in sum, creating more autonomy for expert-based decision-making (Egeberg and Trondal 2018: 10 and 86; Gornitzka and Holst 2015). The proposition is thus that vertical specialization favours agency autonomy vis-à-vis the parent ministry, creating leeway for expert-concerns as well as supranational concerns, while making the governmental model less likely. Similarly, personnel in lower ranked positions are more likely to emphasize their role as experts and/or supranational actors, whereas personnel in higher ranked positions are more likely to emphasize their governmental role.

Methodology and data

A case study must aim at shedding light on a larger population of cases, and it is also recognized by having a generalizable element to it (Gerring 2017). In this study, the DSA serves as a least likely case of supranational and transnational behavioural dynamics since the ´core state´ portfolio of the agency favour the governmental model. The generalizable element to the study relates to both the least likely design and the theoretically derived propositions.

The study benefits from an original dataset based on qualitative research methods. Qualitative methods encompass rich and detailed data which may provide deep understanding of an agency. Interviews render a path into the perceptions of the interviewees, and also into experiences and underlying processes, enabling a better understanding of complex social realities (Smith and Elger 2014: 119; Buchana et al. 2018). Consequently, with an ambition to examine compound agency governance, qualitative interviews are prioritized, not least because it enables reasonable levels of validity (Wockelberg 2014). The interview data constitute the main source of data and consist of 22 semi-structured expert interviews with DSA officials conducted in 2018 and 2019. The interviewees are all highly educated professionals within the fields of physics, biology, chemistry, law, and radiotherapy. They were selected based on their involvement with the agencies' core portfolios as described in the DSA strategy and vision, and all interviewees were selected from the agency management and main departments. The interview questions targeted aspects of their employment, internal and external contact patterns, relationship with the parent ministry, role perceptions, and experiences with international cooperation and relevant EU institutions. Most interviews were conducted face-to-face, except three interviews conducted via the software Lifesize. All interviews were taped, transcribed, and analyzed with the qualitative data analysis software NVivo. To preserve their anonymity, each interviewee was assigned an interview code. The data collected was done in accordance with the requirements of the Norwegian Centre for Research Data (NSD).

Interview data are supplemented with policy documents, notably ´The Instruction for the Norwegian Radiation and Nuclear Safety Authority´ (hereafter ´The Instruction´). It provides important insight into the formal relationship between relevant ministries and the DSA. Letters of appropriation from 2014-2019 are also used, providing insights into annual goals, priorities and assignments allocated from the ministries to DSA.

Complementary dynamics of agency governance

This section is presented in two parts. Part one describes DSA and its task environment. Part two presents core findings according to the conceptual model outlined above.

Part I: The Norwegian Radiation and Nuclear Safety Authority

DSA is part of the Norwegian political-administrative order which has a long history of ministerial delegation to subordinate agencies (Lægreid et al. 2012: 236; Bach 2014). The system is thus characterized by extensive agency autonomy as well as high levels of trust between ministries and agencies (Christensen et.al 2018). The DSA is structurally separated from the ministries, carrying out public tasks for the nation, staffed by public servants, financed by the state budget, and subject to public accountability measures (Christensen and

Lægreid 2006: 12). Agency autonomy, however, is not limited to the formal legal status of the agency (Christensen and Lægreid 2006: 13; Van Thiel and Yesilkagit 2014); agencies are also characterized by high levels of perceived autonomy vis-à-vis ministerial departments (Lægreid et al. 2012: 239). The DSA is subordinated to three parent ministries and thus enjoy the complexity of multiple principals. These are the Ministry of Health and Care Services (MHCS), the Ministry of Foreign Affairs (MFA), and the Ministry of Climate and Environment (MCE). The MHCS serves as the "home-ministry", and the two other ministries allocate specific tasks and responsibilities to the DSA through the Instruction and the annual letters of appropriation. Furthermore, the MFA and the MCE have the right to directly instruct DSA on relevant issues, and through ministerial instruction the DSA is obliged to participate in relevant international forums.

Norwegian agencies have a diverse blend of tasks, including administrative tasks, regulatory and control tasks, service provision, and producing individual goods (Lægreid et al. 2008), but most agencies have regulatory and control tasks as their primary portfolio (Christensen et al. 2018: 43). DSA also enjoys a broad spectrum of tasks: regulation and control of three legal acts, service provisions like measurement services, and providing policy advice to the ministries in a wide range of issues. The latter highlight the DSA as both a governmental authority and an expert body (Christensen et al. 2018: 41). Moreover, studies show that both ministries and agencies emphasize signals both from the government and political leadership as well as expert concerns (Christensen et al. 2018: 72-74). In addition, an important part of the DSA portfolio relates its involvement in the Norwegian Governments' Action Plan for Nuclear Security (the Action Plan) financed and administered by the MFA. Through the Action Plan, the DSA is directly involved with countries like Russia and Ukraine on issues of nuclear safety and security. In sum, the DSA enjoys a compound task profile that does not privilege any of the agency models outlined above. However, its role as expert body seems paramount which suggests that the transnational model is primary to the agency.

Moreover, the DSA is embedded in an EU third-country that is tightly integrated without enjoying formal EU membership. Norway has signed approximately 100 agreements with the EU, rendering it a *de facto* associated EU member (Kühn and Trondal 2019). Norwegian civil servants are granted privileged access to EU-related policy-making and are involved in the handling of everyday relationships with EU institutions in agenda setting processes, and particularly in the implementation and practising of EU law (Kühn and Trondal 2019). In the case of DSA, portfolios are not directly linked to the EEA agreement or Schengen, and the data shows few observations of the DSA participating in ´up-stream´ processes toward EU institutions. As will be illustrated bellow, however, the DSA is involved in ´down-stream´ practicing of EU legislative acts. There are also EU agencies under the Euratom Treaty, however, Norway is not part of Euratom and the DSA is not noticeably involved in Euratom agencies.

DSA staff are also associated to several international and regional organizations such as the International Atomic Energy Agency (IAEA), the World Health Organization (WHO), and the Heads of the European Radiological Protection Competent Authorities (HERCA). In addition, cooperation with sister agencies in the Nordic countries is important. The IAEA and the EU makes regulatory frameworks and standards of relevance for the DSA, and they also serve as hubs for collaboration, professional networking, and knowledge exchange. Collaboration between the DSA and international, European, and Nordic institutions is important for making joint statements, the exchange of best-practices, and developing common norms and drafts to regulatory frameworks.

Part II: Observations of agency governance

Governmental dynamics in the DSA

One general finding suggests that governance in the DSA fits the governmental model well, yet in a compound fashion. The agency receives funding from ministries, they are involved in national regulatory affairs, and their tasks and responsibilities are allocated from the ministry. The agency is moreover subordinated to three parent ministries and we thus observe major differences in how ministries and the DSA mutually interact. These differences are particularly evident toward MHCS and MFA, in which the relationships between DSA and MFA is far more frequent and extensive compared to the relationship between DSA and MHCS. Both observations reflect variation in ministerial capacities (#1) and agency portfolios (#2) (see below).

DSA personnel report behavioural autonomy vis-à-vis their parent ministries. Yet, our data displays two different governmental dynamics between DSA and different ministries. A first governmental dynamic is noticeable between DSA and both MHCS and MCE. One finding suggests that DSA is relatively detached from the MHCS, manifested in *in*frequent attention from the ministry and little staff overlap, which in turn offers leeway for DSA to focus on its role as expert body. Moreover, communication and contact between DSA and MHCS reflect rank (#3): DSA staff at lower ranks tend to communicate through the section head, which in turn informs the head of department. By contrast, DSA staff at the highest levels tend to interact directly with the ministry (MHCS). Moreover, DSA officials at lower ranks tend to assign more weight to the interest of stakeholders, the handling of individual cases, and expert concerns. They report that it is difficult to get the attention of MHCS and that DSA is largely overlooked by the ministry (MHCS):

> "I have very limited contact with the ministry; the contact is done through the hierarchical line. And on my field the ministry is more detached, and I guess they trust us as professionals. But on the other hand; If they had given us more attention, the interest and ownership of the Ministry had

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been greater. So, with closer monitoring from the ministry we would have an improved sense of being a priority" (Interviewee W).

These findings reflect variation in agency portfolios, in which the ministry is less attentive to DSA units working on non-core state portfolios than in core-state portfolios (#2). Furthermore, this observation also reflects vertical specialization of DSA (#3) and a relative lack of ministerial capacity (#1) (see Table 2 below). This picture is also confirmed when considering contact patterns between DSA and MCE. The main interaction is between MCE and some sections within the department of Nuclear Safety and Environmental Protection at DSA, in particular the Nuclear Safety and Pollution Control section. In everyday work, MCE seem to be an important actor only to a limited number of employees at DSA.

In contrast, the relationship between DSA and MFA is pictured as far more extensive. The assignments from MFA are targeted to sections in the department of Nuclear Safety and Environmental Protection, and particularly toward the section of International Nuclear Safety and Security. The DSA-MFA relationship manifests itself in daily contacts between this particular section and the MFA. It is not only the head of the section that enjoys frequent contact towards MFA. Interviewees report that they regularly have meetings with representatives from MFA and consider themselves to function like liaisons. Furthermore, DSA receives a substantial part of its budget from MFA, which is distributed to the sections assigned with MFA-relevant portfolios. Interviewee Y describe the relationship as follows: "Yes, I think we are closely monitored. Surely not in all cases and situations, I wouldn't know, but my impression is that the MFA is very attentive all the time". These findings reflect ministerial capacity (#1) and matching portfolios between ministries and agency (#2).

Table 2 illustrates the distribution of relative ministerial capacity vis-a-vis subordinated agencies, suggesting that MFA have far greater general capacity to interact with and steer subordinated agencies than the two other ministries. However, the MFA generally lacks relevant technical expertise to monitor the DSA (Neumann 2012: 68). According to the interviewees, personnel turnover is fairly high in the MFA, and studies show that approximately 50 to 60% of ministry personnel only have 0-3 years seniority in their current work position (Christensen et al. 2018: 60). This may reduce ministry capacity to steer subordinated agencies (#1).

Table 2 Distribution of ministerial personnel and subordinated agencies

Ministry	Employees	Subordinated Agencies*
MFA	800	2
MHCS	200	11
MCE	250	8

DSA is listed under MHCS. Data gathered from www.regjeringen.no

Next, interviewees report the ´Instruction´ and the annual letters of appropriation as the most important steering tools for the ministries vis-à-vis DSA. The Instruction specifies the role of MHCS as the home-ministry and that MHCS steers through the Instruction, delegation, annual letters of appropriation, and at least two management meetings per year. Formally, MHCS is the most important ministry for DSA, while the two other ministries assign specific tasks to the DSA. The annual letter of appropriation outlines the economic framework for the agency, and operationalizes priorities, goals, and requirements. Studies on ministry-agency relationships also substantiate the influence of ministerial letters of appropriation (Askim et al. 2019). Our observations confirm the influence of the Instruction and the annual letter of appropriation as important ministerial steering documents that provides crucial premises to DSA:

> "The ministries are very important to us because they provide the funding. And clearly, they give us guidelines and directions, and what we do must be grounded in the annual letter of appropriation and the Instruction the DSA has received" (Interviewee H).

An important influence also includes annual funding (#1). DSA receives funding from all three parent ministries, but tensions arise on the internal distribution of these resources within DSA – largely following organizational boundaries and portfolio divisions (#2): Budgets from MCE and MFA are allocated directly to sections in DSA that work on compatible portfolios, while funds from MHCS are distributed generally to the agency as a whole. It is thus ambiguous how funds from MHCS are to be internally allocated, which in turn creates differences in the financial leeway within different DSA portfolios, which generates tension between the main departments of DSA:

> "Yes, there are internal struggles over resources. Some resources are allocated directly to some tasks, and the rest is more like a big pot. So, the distribution of resources is a challenge, and you definitely notice this struggle between the departments. So, returning to the fact that there can be general cuts in the big pot, you suddenly have colleagues who say: "we need to save", but then there are others thinking: "but my project has lots of funding...". And those resources can't necessarily be used for anything else". (Interviewee S)

This tension partly reflects horizontal specialization of the DSA (#2) and partly the unevenly distributed funds (#1). The Department of Radiation Protection and Measurement Services only relate to MHCS, while different sections of the other department relate to different ministries. In general, those sections relating to MHCS receives less ministerial attention and funding than those working on MFA-relevant portfolios. Moreover, those sections working on MHCS-related portfolios experience more constraints in their work due to a lack of funding. The endogenous dispersion of DSA portfolios across sections are thus important drivers for this variation, in which DSA dossiers related to core state powers

receive generally more ministerial attention than dossiers related to non-core state powers.

Enjoying a mixed portfolio, we observe variation in which tasks that attract the attention of DSA staff. The data also reveals a multifaceted role-set among personnel. One interviewee (G) reflected on the borderlines between different roles as follows:

> "There is an awareness that one represents not only oneself, but I do find that I have both trust and autonomy. On arenas focused on research and technical issues, it is fairly uncomplicated, but when we participate on arenas with more explicit political implications, then it is very important to stay focused on your role, and then you need to represent Norwegian policies no matter what you believe to be important yourself. And actually, many of these committees are called "specialist committees", but they have their political implications nonetheless, for all formulations in such professional committees are also something that has consequences upward". (Interviewee G)

Taken together, these observations confirm the prevalence of the governmental model inside the agency, yet not excluding other behavioural dynamics (see below). Two competing sub-governmental dynamics are observed within different parts of the agency. The first is observed between MHCS and DSA in which we see few signs of the governmental dynamic. The other sub-governmental dynamic is observed between the MFA and DSA, where the governmental model is clearly present. Essentially, variation in agency sub-dynamics reflect variation in ministerial capacities (#1) and agency portfolio (#2).

Supranational dynamics in the DSA
The general finding suggests that governance in the DSA only marginally fit the supranational model: Direct interaction between DSA staff and EU-level institutions is rare, and EU institutions are not deemed important in everyday work at the DSA. Consequently, the perceived autonomy toward the EU is considered high. In sum, DSA personnel do not profoundly act as representatives for supranational institutions.

Interviewees at DSA describe the EU as important but not as a key player in their everyday work. The DSA is pictured as an outsider to EU institutions and few observations point to DSA being integrated into EU-level processes. Nevertheless, a stated ambition for DSA and the parent ministries is to be on par with EU regulations, and DSA employees are involved in implementing EU legislative acts:

> "But that's the most important thing perhaps; we strive to be at the very height of the EU directive" (Interviewee E). "The Euratom Treaty is not

part of the EEA agreement, but still, we implement to be on par, but there are some requirements that are at the level of government that we cannot impose. So, then we make the Ministry aware of this and that, and then it's up to them if they want to implement". (Interviewee K)

One prominent example of the profound integration of Norwegian policies into the EU, also in areas which are not part of the EEA agreement, is the harmonization and implementation of the EU Basic Safety Standards (EU BSS) and DSA staff´s emphasize on harmonization and implementation of EU directives (NOU 2012:2: 838). This may in turn point to the asymmetric relationship toward a non-member state like Norway, in which the relationship may be described as ´reactive´ where Norwegian ministries and agencies act as importers of EU legal acts (NOU 2012:2: 840). However, implementing EU directives may also highlight DSA as sub-ordinated to the ministries, where agency officials act in accordance with the preferences of the parent ministry.

The relationship between the EU and the DSA manifests most clearly in the implementation of EU regulations. The EU is essential as a provider of regulatory frameworks, and they may be understood as an important provider of *de jure* premises for the DSA. The EU is also important as a hub for knowledge exchange and expert cooperation. DSA staff participate in Commission expert committees, EU programmes, EU-funded projects, and the European Community Urgent Radiological Information Exchange (ECURIE). Yet, DSA staff do not seem to shift their role perception and loyalties toward the EU-level.

In summary, the relationship between DSA and the EU is pictured as a passive and unilateral adaptation to EU legal acts without significant interaction between DSA and EU-level institutions. The EU is important as the provider of regulatory frameworks and DSA staff
are involved in the transposition of EU regulations. However, the EU plays a secondary role in everyday affairs at the DSA and does not affecting deep-seated role perceptions and loyalties among the staff. These findings may indicate a lack of capacity (#1) of EU-level institutions to bypass ministry departments and profoundly influence domestic agency governance in the nuclear safety sector.

Transnational dynamics in the DSA
The overall findings fit the transnational model well. Compatible with transnational behavioural patterns, interviewees report enjoying considerable behavioural autonomy vis-à-vis both parent ministries and EU institutions. DSA staff are involved in research activities and the exchange of best practices, they perceive themselves to be independent experts, and their loyalty is to a large degree directed toward scientific and professional considerations and concerns. Furthermore, the agency interacts with a wide range of institutions to fulfil their mission, which in turn fuels a knowledge asymmetry vis-à-vis the ministries. In sum, important behavioural premises for the DSA originate from epistemic communities and international professional networks.

First, DSA personnel enjoy autonomy partly due to a need for expertise within their policy field, and partly due to the scarcity of competent personnel at the ministerial level (#1). Contact with epistemic communities and experts is fundamental for the functioning of the agency:

> "It is important to have the international focus, so, if we turn it around: how would we manage if we didn't work internationally – it wouldn't have worked at all! Remember, it's a small area of expertise. So, we who work within DSA would need to have very good justifications if we were to regulate radioactivity, radiation, and emissions, in a completely different way than our international partners". (Interviewee I)

The need to maintain and improve expertise in DSA moreover fuels a knowledge asymmetry toward parent ministries, which in turn safeguards agency autonomy. This observation illustrates that the scarcity of competent personnel in DSA drives agency employees to ask for inputs from colleagues outside DSA. Vertical specialization (#3) enables leeway in DSA for focusing on expert concerns, and the technical portfolio of DSA demand specialized expertise and skills (#2), which reinforces a focus on maintaining and increasing agency expertise:

> "In general, I would say that DSA has a lot of international work, and I also think it is important for us because we are a small country where the right expertise is scarce. So, cooperation across Europe and internationally is important, and this cooperation is quite necessary to ensure that we have enough technical competence to do our job. Thus, we need to benefit from international actors like the IAEA for example" (Interviewee Y).

Important behavioural premises for DSA originate in the Instruction and the annual letter of appropriation. However, these documents do not specify tasks and performances of DSA and represent incomplete contracts. Ambiguous mandates leave the agency with room for manoeuvre:

> "We are governed by annual letters of appropriation, the instructions, and also the strategy, but all of these guidelines are quite broad, so there is ample room for solving tasks in different ways" (Interviewee W). "The letters of appropriation are more like a framework, and we may influence how we work inside this framework. So, I guess our goal is to do what we have been asked to do, but preferably also what we ourselves want to do. But as I said, it usually fits together pretty well". (Interviewee Ø)

Additionally, the letter of appropriation is developed in dialog with the ministry (MHCS). Askim et al. (2019: 476) show that ministries and agencies sometimes ´collaborate in the formulation of performance objectives and indicators´. Our interviewees report that parent ministries emphasise signals from DSA when

preparing the letter of appropriation, and DSA staff report being successful in influencing the contents of this document.

> "It is really our suggestion for what we will be doing, which carries through. Formally, it is the ministries joint letter of appropriation to us which sets our agenda, and formally it is grounded in the State Budget. However, in the State Budget, there are two pages about what DSA is supposed to do. And it's not like it's a surprise to us. It's like someone at the office said, "It's our text in its entirety; we've written it from wall to wall". So, we are the agenda setter ourselves, and that gives us a huge responsibility toward the society". (Interviewee D)

These observations suggest that DSA enjoys considerable leeway vis-à-vis parent ministries, manifested in two ways: First, they influence the contents of vital ministerial steering documents, and secondly, these documents are themselves flexible and leave room of manoeuvre within their set boundaries. Consequently, important decision premises for the DSA does not originate solely from parent ministries but rely also on the independent judgements of DSA staff:

> "But a great deal of the input we get on things that are important to us, often originates from international arenas, international conferences and organisations. So, we take home what is necessary, and this is important premises for our further work". (Interviewee J)

DSA personnel regularly attend conferences, courses, committees, and projects in medical applications, natural radiation sources, emergency preparedness and radioactive source security. Consequently, DSA staff regularly meet peer experts in transnational forums. Moreover, international network-overlap among experts allow them to build professional networks over time (#2). Due to a high demand for exclusive and scarce expertise (#1) at the national level, international professional networks focus the attention of DSA officials toward professional concerns and transnational epistemic communities, which in turn make them less attentive to signals from parent ministries and more to scientific and professional concerns (#3), which in turn fuels agency autonomy.

> "The reason why this is important to us, is that the professional communities are small, and there are very few people working on every single issue—sometimes just one person. So, it's very vulnerable, and to have colleagues, you must go outside your country. So, I guess that's what I'm passionate about: professional cooperation. Professional networking and collaboration are important". (Interviewee G)

The specialization of attention among DSA staff thus provides ´silo-logics´. The DSA portfolio focuses on safety, security, and safeguards, and DSA staff are affiliated to international and regional institutions that share similar portfolios (#2). The horizontal portfolio-specialization of DSA thus influences its

international engagements. However, interviewees mostly consider the IAEA to be exceedingly important and influential on the overall DSA portfolio.

Consistent with a transnational model, both the Instruction and the interviewees describe the DSA as a national expert authority. Interviewees moreover suggest that DSA is involved in tasks like research and the exchange of best-practices, and collecting, analysing, disseminating, and storing of information. Furthermore, DSA employee's role perceptions are geared toward being experts. Their tasks and transnational cooperation (#2) underscore their expert role. One example of the importance of the expert role is found in the relationship between DSA and the parent ministries. DSA staff working on ´core-state´-related portfolios of relevance to the MFA were expected to report less autonomy vis-à-vis the ministry and to act like government representatives. Our findings, however, suggest that DSA personnel acts as experts *regardless* of which parent ministry and portfolio they relate to. Interviewees report that it is imperative that safety and security decisions are not challenged or overruled by ministerial departments.

Furthermore, DSA staff experience leeway to structure their own workday and have opportunities to work on self-initiated projects. A majority of DSA staff report significant leeway to influence both what to do and how to do it, and moreover, their perceived autonomy does not vary according to portfolio and parent ministry.

> "People have their own tasks and it's quite individual what you are working on. I have projects and activities that I manage myself, and professionally speaking, I am the expert within my field, so, there is nobody else who has much to object or to say". (Interviewee S)

Finally, interviewees´ expert role is also reflected in their loyalty perceptions: highly educated professionals feel loyalty towards and favour scientific and professional concerns. This is moreover seen as a means to consolidate the overall legitimacy of the DSA, which in turn is likely to fuel agency autonomy vis-à-vis ministries (interviewees).

In sum, this section suggests that agency staff act as independent experts and enjoy autonomy as professional experts, reflecting organizational size (#1), horizontal specialization (#2), and vertical specialization (#3). Contrary to Genschel and Jachtenfuchs (2014), however, this section also reports that the transnational agency model is evident also in agency portfolios of core state powers.

Conclusions
This study unveils the compound nature of agency governance and suggests organizational conditions thereof. The paper outlined a conceptual map of

compound agency governance and offered an empirical illustration of contending agency dynamics in the case of DSA. Two main contributions are highlighted: Firstly, *endogenous* variation in behavioural logics among agency staff suggest that the DSA is internally torn between two main governance dynamics: Those sections in the agency that work on portfolios of ´core state powers´ tend to mobilize the governmental dynamic, while other sections of the agency are biased towards the transnational dynamic. Agency personnel across the agency strongly emphasized their role as experts rather independently of their portfolio and relevant parent ministry. This finding suggests that the DSA is generally biased toward a transnational model with a focus on expertise and the competency of the personnel. Secondly, the study demonstrates that endogenous organizational characteristics are vital determinants in balancing behavioral logics inside DSA. Our observations particularly reflect variation in ministerial and agency capacity (#1), the technical portfolio of the agency (#2), and the vertical specialization of the DSA vis-à-vis three parent ministries that facilitate leeway for expert concerns throughout the agency (#3).

The nuclear safety sector serves as a least likely case of multilevel administrative governance in which the portfolio of ´core state´ is likely to bias agencies toward the governmental model. Our findings confirm that agency staff engaged in portfolios of core state powers are more closely monitored by their parent ministry than officials whose portfolios relates to non-core state powers. Consequently, non-core portfolios are potentially more influenced by EU-level institutions. Yet, the study shows how this brute policy dichotomy breaks down when zooming into the agency. EU institutions are not deemed more important within non-core state portfolios than in core-state portfolios, leaving the supranational model least relevant. In sum, the study shows how endogenous tensions of agency governance between the ´governmental model´ and the ´transnational model´ is organizationally contingent, as well as how transnational agency governance is prevalent even in portfolios of core state powers.

We envisage four avenues for future research on agency governance. Theoretically, the organizational approach outlined has a profound design potential to it. Thus, theoretically oriented empirical studies of agency governance should connect causal findings of agency governance to potential design possibilities, thus linking science and craft in systematic ways (see Egeberg and Trondal 2018). Secondly, we would propose a more systematic focus on the study of micro-level aspects of agencies, enabling more fine-grained understanding of agency-life. Such studies, however, should also aim to *theoretically* trace links from micro-level changes (e.g. loyalty shifts or behavioural patterns) to macro-level changes (e.g. the transformation of political order). Third, we would suggest that the agency governance literature investing in longitudinal studies that introduces datasets over time, enabling *dynamic studies* of agency governance in multilevel systems. This might enable, for example, to study continuity and change in loyalties of agency personal. Finally, we would suggest that the literature on European agencies that are embedded in

multilevel governance architectures also go beyond Europe and examine their broader roles in transnational agency networks (see Stone and Moloney 2019).

References

Askim J, Bjurstrøm KH and Kjærvik J (2019) Quasi Contractual Ministerial Steering of State Agencies: Its Intensity, Modes, and How Agency Characteristics Matter. International Public Management Journal 22(3): 470-498.

Bach T (2014) The autonomy of government agencies in Germany and Norway: Explaining variation in management autonomy across countries and agencies. International Review of Administrative Sciences 80(2), 341-361.

Bach T, Ruffing E and Yesilkagit K (2015) The Differential Empowering Effects of Europeanization on the Autonomy of National Agencies. Governance 28(3): 285-304.

Barnett M and Finnemore M (2004) Rules for The World. Ithaca: Cornell University Press.

Bartolini S (2005) Restructuring Europe. Oxford: Oxford University Press.

Buchana Y, Garbutt M and Seymour LF (2018) Identifying Micro-Level Generative Mechanisms of ICT-Enabled Performance Improvement in Resource-Constrained Healthcare Organisations: A Critical Realist Perspective. E J Info Sys Dev Countries. e12057. https://doi.org/10.1002/isd2.12057

Christensen T and Lægreid P (2006) Autonomy and regulation: Coping with agencies in the modern state (Comparative studies of organizations in the public sector). Cheltenham: Edward Elgar.

Christensen T and Lægreid P (2007) Regulatory Agencies—The Challenges of Balancing Agency Autonomy and Political Control. Governance 20(3), 499-520.

Christensen T, Egeberg M, Lægreid P and Trondal J (2018) Sentralforvaltningen: Stabilitet og endring gjennom 40 år. Oslo: Universitetsforlaget

Cross MK Davis (2013) Rethinking Epistemic Communities twenty years later. Review of International Studies 39 (1): 137-160.

Djelic ML and Sahlin-Andersson K (2006) Introduction: A world of governance: The rise of transnational regulation. In Djelic ML and Sahlin-Andersson K (eds.) Transnational Governance: Institutional Dynamics of Regulation (pp.1-30). Cambridge University Press.

Egeberg M and Trondal J (2009) Political Leadership and Bureaucratic Autonomy: Effects of Agencification. Governance 22(4): 673-688.

Egeberg M and Trondal J (2017) Researching European Union Agencies: What Have We Learnt (and Where Do We Go from Here)? Journal of Common Market Studies 55(4): 675-690.

Egeberg M and Trondal J (2018) An Organizational Approach to Public governance. Understanding and Design. Oxford: Oxford University Press.

Funabashi Y and Kitazawa K (2012) Fukushima in review: A complex disaster, a disastrous response. Bulletin of the Atomic Scientists 68(2): 9–21. https://doi.org/10.1177/0096340212440359

Genschel P and Jachtenfuchs M (2014) Introduction: Beyond Market Regulation. Analysing the European Integration of Core State Powers´. In: Genschel P and Jachtenfuchs M (eds.) Beyond the Regulatory Polity? The European Integration of Core State Powers. Oxford: Oxford University Press.

Gerring, J (2007) Case Study Research. Cambridge: Cambridge University Press.

Gerring, J (2017) Case Study Research (2nd ed.). Cambridge: Cambridge University Press.

Gilinsky V (1992) Nuclear safety regulation. Lessons from US experience. Energy Policy 20 (8): 704-711

Gornitzka Å and Holst C (2015) The Expert-Executive Nexus in the EU: An Introduction. Politics and Governance 3(1), 1-12.

Haas P (1992) Introduction: Epistemic Communities and International Policy Coordination. International Organization Vol. 46 (1) 1: 1-35.

Hofstad K (2019) Kjernekraft i Norge (Nuclear energy in Norway). Store norske leksikon. Retrieved 23. oktober 2020 from https://snl.no/kjernekraft_i_Norge

Kemeny JG (1979) Report of the Presidents Commission on the accident at Three Mile Island. http://large.stanford.edu/courses/2012/ph241/tran1/docs/188.pdf

Kirck E and Holst C (2019) Experts and Democratic Legitimacy. London: Routledge.

Kjaer PF and Vetterlein A (2018) Regulatory governance: rules, resistance and responsibility. Contemporary Politics 24:5, 497-506, DOI: 10.1080/13569775.2018.1452527

Koop, Christel and Lodge, Martin (2017) What is regulation? An interdisciplinary concept analysis. Regulation and Governance, 11 (1). pp. 95-108.

Kühn N and Trondal J (2019) European integration and the administrative state. A longitudinal study on self-reinforcing administrative bias. Journal of European Public Policy 26:9, 1373-1394, DOI: 10.1080/13501763.2018.1520913

Levi-Faur, D. (2011) Regulation and regulatory governance. In Levi-Faur D (ed) Handbook on the politics of regulation. Edward Elgar, pp.3-24.

Lægreid P, Roness PG and Rubecksen K (2008) Controlling Regulatory Agencies. Scandinavian Political Studies 31: 1-26. doi:10.1111/j.1467-9477.2008.00193.x

Lægreid P, Roness PG and Rubecksen K (2012) Norway. In: Verhoest K, Van Thiel S, Bouckaert G and Lægreid P (eds) Government Agencies. Basingstoke: Palgrave Macmillan, pp. 234–244.

Majone G (1994) The rise of the regulatory state in Europe. West European Politics, 17:3, 77-101.

Majone G (1996) Regulation and its modes. In Majone G (edt.) Regulating Europe. Routledge, pp.9-27.

Majone G (1996) The rise of statutory regulation in Europe. In Majone G (edt.) Regulating Europe. Routledge, pp.47-60.

Majone G (2001) Two Logics of Delegation: Agency and Fiduciary Relations in EU Governance. European Union Politics, 2(1): 103–122.

March JG and Olsen JP (2006) Elaborating the "new institutionalism". Rhodes RAW, Binder SA and Rockman BA (eds.) The Oxford handbook of political institutions (pp. 3-20). Oxford University Press.

Marcussen M and Trondal J (2011) The OECD civil servant: Caught between Scylla and Charybdis. Review of International Political Economy 18(5): 592-621.

Martinsen DS, Schrama R and Mastenbroek E (2019) Here to stay? Analyzing the stability and resilience of transgovernmental networks. Unpublished paper.

Massey A (1986) Professional Elites and BNFL. Politics 6(1): 9-17. doi:10.1111/j.1467-9256.1986.tb00156.x

Matthews F (2012) Governance and state capacity. In Levi-Faur D (edt.) The Oxford Handbook of Governance. Oxford: Oxford University Press.

Neumann I (2012) At home with the diplomats: Inside a European foreign ministry (Expertise: cultures and technologies of knowledge). Ithaca, N.Y: Cornell University Press.

NOU (2012:2) Outside and Inside — Official Norwegian Reports. Ministry of Foreign Affairs Norway. Available at:
https://www.regjeringen.no/en/dokumenter/nou-2012-2/id669368/
https://www.regjeringen.no/contentassets/5d3982d042a2472eb1b20639cd8b2341/no/pdfs/nou201220120002000dddpdfs.pdf

Olsen JP (2006) Maybe it is time to rediscover bureaucracy. Journal of Public Administration Research and Theory 16(1): 1-24.

Olsen JP (2007) Europe in Search of Political Order. Oxford: Oxford University Press.

Olsen JP (2010) Governing through Institutional Building. Oxford: Oxford University Press.

Rokkan S (1999) State Formation, Nation-building and Mass Politics in Europe. Oxford: Oxford University Press.

Smith C and Elger T (2014) Critical Realism and Interviewing Subjects. In Edwards PK, O'Mahoney J and Vincent S (eds.) Studying Organizations Using Critical Realism. Oxford: Oxford University Press.

Stone D and Moloney K (2019) The Oxford handbook of global policy and transnational administration (First edition.). Oxford University Press.

Thornton P and Ocasio W (2008) Institutional logics. In Greenwood R, Oliver C and Suddaby R (eds.) The SAGE handbook of organizational institutionalism (pp. 99-128). London: SAGE Publications

Thornton PH, Ocasio W and Lounsbury M (2012) The institutional logics perspective: A new approach to culture, structure, and process. Oxford University Press.

Trondal J (2016) Advances to the study of international public administration. Journal of European Public Policy 23(7): 1097–1108.

Trondal J and Bauer M (2017) Conceptualizing the European multilevel administrative order: Capturing variation in the European administrative system. European Political Science Review *9*(1): 73-94.

Trondal J, Marcussen M, Larsson T and Veggeland F (2010) Unpacking International Organisations. Manchester: Manchester University Press.

Temples JR (1982) The Nuclear Regulatory Commission and the Politics of Regulatory Reform: Since Three Mile Island. Public Administration Review 42 (4): 355-362

Van Thiel S and Yesilkagit K (2014) Does task matter? The effect of task on the establishment, autonomy and control of semi-autonomous agencies. International Review of Administrative Sciences 80(2): 318-340.

Verhoest K, Peters BG, Bouckaert G and Verschuere B (2004) The study of organisational autonomy: a conceptual review. Public Administration and Development 24: 101-118.

Vibert F (2014) The new regulatory space. Reframing democratic governance. Cheltenham: Edward Elgar Publishing.

Wang Q and Chen X (2012) Regulatory failures for nuclear safety – the bad example of Japan – implication for the rest of world. Renewable and Sustainable Energy Reviews16 (5): 2610-2617

Wang Q, Chen X and Yi-chong X (2013) Accidents like the Fukushima unlikely in a country with effective nuclear regulation: Literature review and proposed guidelines. Renewable and Sustainable Energy Reviews 17:126-146

Wockelberg H (2014) Political Servants or Independent Experts? A Comparative Study of Bureaucratic Role Perceptions and the Implementation of EU Law in Denmark and Sweden. Journal of European Integration 36(7): 731-747.

Article 2: Nordic cooperation in the Nuclear Safety Sector. High, Low or Differentiated integration?

Abstract

Nordic cooperation has been depicted as eroding due to the increased importance of EU-related cooperation and integration. However, scholars propose that longstanding Nordic networks, grounded in professions and located in the state administration, may prove to be more robust toward external changes. This article discusses this proposal by looking at Nordic cooperation between the national radiation protection and nuclear safety authorities in Iceland, Denmark, Norway, Sweden, and Finland. The article maps behavioural perceptions of agency staff based on a dataset of 37 interviews to illustrate if the cooperation between the Nordic authorities is characterized by high integration, low integration, or differentiated integration within the nuclear safety sector. The study finds that the cooperation is differentiated between the highly integrated areas of radiation protection and emergency preparedness, and the less integrated areas of nuclear security and safeguards. To account for variation, the data indicates the importance of path dependency and portfolio.

Introduction

It has been suggested that the world should look to the Nordic countries in order to build prosperous, well-governed, and liberal democracies. In this view, the Nordic combination of a strong state, well-functioning rule of law, and a responsible democracy is a promising recipe for good government (Lægreid, 2020, p. 421). Moreover, political scientists discuss the features of 'Nordic models' (Knutsen, 2017, p. 9), while some depict the Nordic countries as 'Nordic lights' showing the way in times of crisis (Nedergaard & Wivel, 2018, p. 2). Scholars also ask if and how European integration through the European Union challenges and changes cooperation between the Nordic countries (Olsen & Sverdrup, 1998, pp. 10–12). Furthermore, studies on government agencies cluster the Nordic countries together based on their geographical location and shared politico-administrative culture (Verhoest, van Thiel, Bouckaert, & Lægreid, 2012, p. 10), and these countries are characterized by large public sectors with small core governments, numerous large agencies, and large-scale decentralization of tasks and competencies to the subnational levels of governments (Verhoest et al., 2012, p. 15). Moreover, the Nordic countries are relatively small, with informal administrative culture, a high level of mutual trust between political and

administrative executives, and extremely low corruption rates (Balle Hansen, Lægreid, Pierre, & Salminen, 2012, p. 259; Lægreid, 2018, p. 83; Verhoest et al., 2012, pp. 15–16).

The focus of this article is Nordic cooperation in the nuclear safety sector, and this sector may be divided into three different pillars: safety, safeguards, and security. Safety is defined as the protection of people, environment, and society from the consequences of radiation. It includes radiation safety and radiation protection concerned with issues like the use of radiation in medicine. Moreover, safety covers emergency preparedness, and finally, safety encompasses nuclear safety, which in general is about how to operate nuclear facilities to avoid accidents. Safeguards is about ensuring that nuclear material, technology, and information is used for peaceful purposes, and not to develop nuclear weapons. It thus includes arms control and non-proliferation. Finally, security is linked to both safety and safeguards and it is mainly about protecting nuclear facilities from terrorism, and how to avoid theft of nuclear material, technology, and information. The article examines cooperation between the national authorities on radiation protection and nuclear safety in the five Nordic countries of Iceland, Denmark, Norway, Sweden, and Finland. A shared characteristic between these authorities is that they are expert bodies where specialized knowledge is essential, and the workforce is characterized by highly educated and skilled experts (Krick & Holst, 2020, p. 2). An important differentiating feature is that only Sweden and Finland have nuclear power plants. Denmark and Norway have had nuclear research reactors, while Iceland never have had nuclear power-generating installations.

The article asks: Why does the degree of integration vary between issues of safety, security, and safeguards, involving the same actors, in the same sector, at the same level? To account for this variation, the article studies the effect of institutional and organizational variables. In so doing, two basic assumptions emerge: first, history and context matter (Lægreid, 2020, p. 424; Olsen, 2018). Scholars have emphasized the essential role of history and the problems of universal, non-contextual explanations by not analysing the conditions under which organizational factors are likely to have explanatory power. As different public administrations are located differently in time and space, the question is how the past affects the future and how public administrations learn—or not—from experience and changing environments (Olsen, 2018). Secondly, organization matters (Olsen, 2018). It has been argued that organization theory is a powerful instrument for approaching public governance as organizational factors are expected to create biases in governance processes, making some choices more likely than others (Egeberg & Trondal, 2018, pp. 1–4; Lægreid, 2020, p. 422). The article therefore contributes to the organization theory-based institutional approach in public administration research (Lægreid, 2020, p. 421) by emphasising that public bureaucracies are more than instruments in the hands of national governments. They are also partly autonomous institutions that do not adapt in a simple and straightforward way to new steering signals or to changing environmental pressure (Lægreid, 2020, p. 423).

Furthermore, the phenomenon of inter-administrative coordination has been predominantly studied with a focus on their proliferation and effectiveness in promoting common principles, rules, and best practices (Keohane & Nye, 1974; Slaughter, 2004). Studying the cooperation between the Nordic authorities in the nuclear safety sector adds to this literature by unpacking the cooperation itself. The study also reflects discussions on differentiated integration (Gänzle, Leruth, & Trondal, 2020) and shows that Nordic cooperation in the nuclear safety sector best can be described as differentiated between the highly integrated safety areas of radiation protection and emergency preparedness, and the less integrated areas of nuclear safety, security, and safeguards. Finally, the article demonstrates how national authorities collaborate in a sector where parts of the portfolio are 'core state powers.' Core state powers are defined by their "institutional significance for state-building," which include foreign and defence policy, public finances, public administration, and the maintenance of law and order (Genschel & Jachtenfuchs, 2014, p. 1). The implication is twofold: First, the case facilitates an opportunity to study the effect of non-core and core state portfolios on cooperation within the same sector; secondly, portfolios of core state powers are a hard case where highly integrated cooperation is less likely. The national authorities in the Nordic countries have portfolios reaching from non-core issues—like radiation protection—to core state issues, such as nuclear security. The study finds that the differentiated cooperation between the Nordic authorities in the nuclear safety sector mirrors the division between non-core portfolios and core-state portfolios. Hence, the data indicates the importance of path dependency as well as portfolio where integrated cooperation is more challenging to establish and maintain in core-state portfolios.

The article proceeds as follows. Section 2 outlines the theoretical framework in two steps: First, integration is defined and operationalized, and secondly, independent variables that might account for variation are outlined. Sections 3 and 4 briefly introduce the method and data, and present the empirical findings. Section 5 summarizes key findings and contributions to the literature.

Theoretical Framework

This article focuses on the organization theory-based institutional approach to public administration. In organization theory, integration is understood as the coordination between two or more actors and how they adapt collaboratively to solve a problem or provide a service (Jacobsen, 2017, p.198). Coordination is thus pictured as the purposeful alignment of tasks and efforts to achieve a defined goal (Lægreid & Rykkja, 2015; Verhoest & Bouckaert, 2005, p. 95). The term coordination also implies the use of mechanisms that more tightly and formally link together different units (Keast & Mandell, 2014). Through coordination mechanisms—and thus the integration of units—synergies are created, enabling organizations to become more efficient and effective (Jacobsen, 2017, p. 197). National agencies, as public entities, are expected to create optimal value for citizens, and cooperation between agencies is thus a means to increase value. Consequently, cross-territorial cooperation between functionally similar agencies

is mainly about how these agencies manage to pool and exploit common resources across territories (Jacobsen, 2017, p. 204). In literature on inter-organizational relations, coordination is defined as a behavioral process with focus on interactions and relations between actors. This approach also concentrates on how the interaction is organized, and the aim is to highlight explanations for coordinative behaviour both by looking at characteristics of the actors involved and the characteristics of how the coordination between organizations is organized or structured (Jacobsen, 2017, p. 200).

The degree of integration between the authorities is operationalized by looking at four coordination mechanisms focused on both behaviour and organizational dimensions (see Table 1). First, the most used operationalization of coordination appears to be the type and intensity of interaction between actors (Jacobsen, 2017, p. 210; Keast & Mandell, 2014). This article thus concentrates on contact patterns and communication flows, where regular contact and communication indicate a high degree of integration. Secondly, the existence of reciprocal trust will most likely have a substantial impact on coordination, where trust makes communication flow easier, reduces costs associated with monitoring other actors in the cooperation, and dampens conflict between participants (Jacobsen, 2017, p. 211). Thirdly, high levels of integration are recognized by the degree of formalization in the cooperation. The existence of permanent structures where the actors involved can meet to coordinate activities through direct communication indicates high degrees of integration (Jacobsen, 2017, p. 207; Keast & Mandell, 2014). Finally, the pooling of resources imply that tasks and different types of resources are 'moved out' of the original organizations, suggesting higher degrees of integration (Jacobsen, 2017, p. 208). In addition, this article includes the perceived importance of the cooperation as an indicator of the level of integration. The degree of integration in the cooperation between the Nordic authorities on radiation protection and nuclear safety is analyzed on a continuum reaching from a low degree of integration to a high degree of integration (see Table 1).

Table 1. Operationalization of integration.

Proxy	Low degree of integration	High degree of integration
Contact pattern	Infrequent communications flows	Regular communications flows
Trust	Low reciprocal trust	High reciprocal trust
Formalization	None or ad hoc	Permanent structures
Resources	Resources remain in each authority	Pooled resources
Perceived importance *	Low	High

Note: * Of the cooperation. Source: Based on Jacobsen (2017) and Keast and Mandell (2014).

To account for variation on the degree of integration, the article studies the effect of historical institutionalism and organization structure. While the degree of integration is not simply conditioned by these factors, the aim is to show that historical institutionalism and organizational structure adds to the understanding of which factors influence integration in cooperation between national agencies at a higher level, such as the Nordic one. The article discusses the effect of path-dependency, size, horizontal specialization, and vertical specialization on integration, by both studying properties of the Nordic cooperation itself, and also by looking at characteristics of each individual authority in the Nordic countries. Historical institutionalism is based on the basic assumptions that history matters, and that history is not a chain of independent incidents (Steinmo, 2008). The focus is thus on the construction, maintenance, and adaptation of institutions (Sanders, 2006, p. 42), emphasizing the origin and evolution of the rules, norms, and practices shaping policy outcomes and the structure of polities (Fioretos, Falleti, & Sheingate, 2016). The conceptual toolbox related to historical institutionalism consists of concepts like path dependence and critical junctures (Fioretos et al., 2016).

In this study, path dependency is understood as "dynamic processes involving positive feedback" (Fioretos et al., 2016) overlapping with the idea of 'increasing returns' (Pierson, 2000). These ideas capture a basic element in understanding path-dependency displaying how the costs of changing from one alternative to another will increase over time creating a self-reinforcement dynamic, making deviation from an existing path increasingly more difficult (Fioretos et al., 2016; Pierson, 2000). Path-dependent processes are born through critical junctures, understood as "a period of significant change, which typically occurs in distinct ways in different countries (or in other units of analysis) and which is hypothesized to produce distinct legacies" (Collier & Collier, 2002, p. 29). Thus, path dependency shows how particular historical junctures have lasting consequences. However, path dependent arguments based on positive feedback propose that not only 'big' events have big consequences. Small ones, that happen at the right time, can have vast consequences as well (Pierson, 2000). Furthermore, literature on institutional change suggests that path-dependent lock-in is a rare phenomenon, opening the possibility that institutions normally evolve in incremental ways (Thelen & Mahoney, 2010, p. 3).

In relation to Nordic cooperation in general, Olsen and Sverdrup (1998, p. 26) suggested that longstanding Nordic networks, grounded in professions and located in the state administration, may prove to be more robust toward external changes than Nordic cooperation which lack these characteristics. In broad terms, robustness refers to a complex system's ability to remain functional and stable despite uncertainty, and also to the system's capacity to withstand and survive external shocks (Bankes, 2010; Capano & Woo, 2017). Moreover, in organization theory, robustness refers to an organization's capacity to retain its core characteristics under evolving circumstances (van Oss & van 't Hek, 2011, p. 4). Though discussed, robustness is often associated with the concept of resilience

(Capano & Woo, 2017; Walker, Holling, Carpenter, & Kinzig, 2004), and both concepts may function as frameworks for understanding how complex systems self-organize and change over time (Anderies, Folke, Walker, & Ostrom, 2013). Regarding path dependency, proposition one (#1) is that Nordic cooperation will be more integrated if the cooperation has been successful in achieving its goals leading to positive feedbacks and self-reinforcing dynamics. Moreover, integrated cooperation is more likely if there is a longstanding history where critical junctures have strengthened the cooperation. Finally, integration increases if the cooperation has showed robustness toward external changes and shocks. The expectation is therefore that Nordic cooperation in this sector will be more integrated on issues of radiation protection, rather than on nuclear safety, security, and safeguards.

An organization structure is a normative structure consisting of rules and norms specifying, more or less clearly, who is expected to do what and how (Egeberg & Trondal, 2018, p. 5). Different dimensions of the organizational structure enable varied insights into how structure affects individual behaviour (Egeberg & Trondal, 2018, pp. 6–7). The following outlines three structural variables: size, horizontal specialization, and vertical specialization:

- The size of an organization indicates the capacity to initiate policies, develop alternatives, implement decisions, and monitor compliance (Egeberg & Trondal, 2018, p. 7). Large organizations, in terms of staff size, are therefore less dependent on other actors or organizations to carry out its task, and thus they are more autonomous than smaller organizations. Consequently, small organizations must, to a greater degree than their larger counterparts, build capacity through other means, like cooperation, using the potential benefits of economies of scale (Jacobsen, 2017, p. 203). Proposition two (#2) is thus that large authorities in this sector, like those in Sweden and Finland, will be less integrated into the Nordic cooperation than the smaller authorities in Denmark, Norway, and Iceland.

- Horizontal specialization shows how different policy areas and issues are supposed to be linked together or de-coupled from each other (Egeberg & Trondal, 2018, p. 8). Moreover, horizontal specialization influences the division of portfolios in organizations. In the case of the Nordic authorities on radiation protection and nuclear safety, their overall portfolio may be viewed through two different lenses. The first lens divides the portfolio into core state and non-core portfolios. Core state powers portfolios are connected to foreign and defence policy and include issues like nuclear security and safeguards. The other lens divides the portfolios into the three pillars of safety, security, and safeguards. Two propositions follow: First, the expectation

is that there will be both less cooperation and integration between the Nordic authorities on core state portfolios because these policy areas will be more closely tied to the national government and parent ministries (#3). Secondly, the expectation is that cooperation between the authorities will follow departmental lines, where units with shared sector affiliation will collaborate (#4). Hence, different parts of the national authorities will be involved in Nordic cooperation to different degrees and extent, and the cooperation between the Nordic authorities will therefore be characterized by differentiated integration.

- Vertical specialization refers to the division of labour between different hierarchical levels within or between organizations. Studies show that inter-organizational specialization leads to agency officials paying significantly less attention to signals from executive politicians than their counterparts in the ministries, creating more leeway for expert-based decision-making (Egeberg & Trondal, 2018, pp. 10, 86; Holst & Gornitzka, 2015). Hence, vertical specialization favours agency autonomy vis-à-vis the national government and parent ministries, creating leeway for expert-concerns rather than national, political concerns. Proposition five (#5) is thus that organizations, which are de-coupled from the parent ministry, will be more likely to engage in Nordic cooperation than organizations structured as part of the parent ministry or other overarching organizations, like the authorities in Denmark.

Data and Method

To unpack the cooperation between the Nordic authorities in the nuclear safety sector, this study benefits from an original dataset based on a qualitative research method. Qualitative methods encompass rich and detailed data which may provide deep understanding. Moreover, interviews open a window into the perceptions of interviewees, their experiences, and underlying processes, enabling a better understanding of complex social realities (Buchana, Garbutt, & Seymour, 2018; Smith & Elger, 2014, p. 119). The interview data consists of 37 semi-structured expert interviews with officials from all of the national authorities on radiation protection and nuclear safety in the Nordic countries, conducted in 2018 and 2019. 22 interviews were conducted at the Norwegian Radiation and Nuclear Safety Authority (DSA), with the remaining 15 interviews from the authorities in Iceland, Denmark, Sweden, and Finland. All interviewees are highly educated and skilled professionals, and the data include interviews with officials from the management level of all the authorities. Staff working on communication and administration have not been included. The interviewees were selected based on their strategic position and widespread knowledge of the functioning of the authorities, and key contacts in the authorities also contributed to recruiting new interviewees. The

interview questions targeted aspects of employment, internal and external contact patterns, relationship with the parent ministry, role perceptions, and experiences with international cooperation at different levels. All 37 interviews are important for the findings presented, although primarily presented at an aggregated level. Most interviews were conducted face-to-face, except five interviews conducted via Skype and Lifesize. The interviews were taped and transcribed. To preserve their anonymity, each interviewee was assigned an interview code. The data was collected in accordance with the requirements of the Norwegian Centre for Research Data.

Empirical Findings

It is not possible to narrow the cooperation between the Nordic authorities in the nuclear safety sector down to one singular cooperation. Instead, the cooperation follows the division between the three main pillars of safety, security, and safeguards. The data shows that there are important differences in how the national authorities interact within these different pillars, and there is a continuum ranging from safety issues, like radiation protection and emergency preparedness, where the cooperation is characterized by high integration, whereas in security and safeguards issues, cooperation is marked by low integration.

The cooperation on safety can be divided into four different parts: cooperation on radiation protection, emergency preparedness, the Nordic Nuclear Safety Research (NKS), and cooperation on nuclear safety. The cooperation on radiation protection and emergency preparedness is mainly organized around the Nordic chiefs meeting. Once every year the directors of the Nordic authorities gather, and they have several working groups that report to the chiefs meeting. The NKS, mainly funded by the Nordic authorities, is a platform for Nordic research on nuclear safety that includes emergency preparedness. Direct cooperation on nuclear safety is most evident between the Swedish Radiation Safety Authority (SSM) and the Radiation and Nuclear Safety Authority (STUK) in Finland. However, there is not a general Nordic cooperation in this area comparable to the one on radiation protection and emergency preparedness. Moreover, the SSM and the STUK have a confidentiality agreement which allows them to discuss some security issues. This may indicate that the cooperation between the Swedish and Finish authorities within the nuclear safety sector is more integrated than the overall Nordic cooperation.

The Nordic chiefs meeting and the working groups on radiation protection and emergency preparedness is the most integrated cooperation between all the Nordic authorities. It is characterized by high levels of trust, continuous communication flows, some attempts to pool resources, joint projects, and permanent structures through the working groups and the annual chiefs meeting. It is also perceived as

important by the interviewees. A prominent example is the Nordic Working Group of Emergency Preparedness (NEP):

> We have a great Nordic cooperation with sister agencies in the other countries. We meet twice a year, all of us working on emergency preparedness in these countries. And we can have joint publications, joint working groups, joint exercises, seminars, and workshops, so it is very important for us to have this Nordic network. And of course, we cooperate with many others as well, but I would probably say that the most important sphere is the Nordic cooperation, because that is where the nearest nuclear facilities are located. That is one part of it, but it is also important to have joint Nordic recommendations, for example. So, we know each other well! (Interviewee 36)

Furthermore, interviewees underscore the importance of building strong relationships, with a foundation of trust and shared knowledge, to gain joint understandings of practices in the other countries. Another critical element to the cooperation is the need for colleagues, which is scarce at the national level, and interviewees explain why cooperation is important as follows:

> The reason why this is important to us, is that the professional communities are small, and there are very few people working on every single issue—sometimes just one person. So, it's very vulnerable, and to have colleagues, you must go outside your country. So, I guess that's what I'm passionate about: professional cooperation. (Interviewee 21)

Finally, attempts to pool resources and benefit mutually within the field of radiation protection are described in this way:

> We are small countries with limited resources, so we don't need to do the same things in all the five countries. That's a very good output of the Nordic groups—it is better to cooperate, compared to everyone doing the same things by themselves. (Interviewee 2)

The modern awareness of ionizing radiation started in the late 1800s with the discovery of X-rays and radioactive uranium, giving rise to medical radiation. In the 1930s scientists achieved nuclear fission, which led to the construction of nuclear reactors and the atomic bomb. Indeed, the scope of both the dangers and possibilities of nuclear energy peaked during the Second World War, giving birth to cooperation targeted to encourage and facilitate safe and peaceful use of nuclear energy like the establishment of the International Atomic Energy Agency (IAEA)

in 1957. The Nordic countries were also interested in peaceful use of nuclear energy and Norway, Sweden, and Denmark proved to be forerunners by building research reactors during the 1950s, while Finland had their first research reactor operating from 1962. However, only Sweden and Finland decided to construct nuclear reactors for energy production, first put into operation during the 1960s and the 1970s. Today, all the research reactors have been, or are in the process of being, decommissioned. Only reactors for energy production in Sweden and Finland continue to operate in the Nordic countries.

Regarding the historical roots of the Nordic cooperation within the nuclear safety sector, the events of the Second World War prompted the Nordic countries to have their own nuclear meetings from 1949. Eventually, this led to two parallel tracks of Nordic cooperation within this field. The first track originated in 1957 with an initiative of the Nordic Council of Ministers (NCM) to establish a permanent committee on questions related to nuclear energy: the Nordisk kontaktorgan for atomenergispørsmål (NKA). The Suez Crisis in 1956 underscored Europe's dependence on imported oil and the NKA was to oversee planning and activities in the field of atomic energy and encourage mutual assistance in case of nuclear accidents. The NKA was made up of officials from the ministries of energy, industry, and foreign affairs, accompanied by experts. Economic growth in the Nordics during the late 1960s increased the demand for electricity, making questions of nuclear power highly relevant. The NKA formed new groups to address such questions, and while the NKA grew, the organization increasingly became more complex and less transparent. The 1970s and 1980s brought growing concerns for the environment, pollution, and modern technology, exemplified by *The Limits to Growth* report from 1972. Simultaneously, the opposition against nuclear power grew in the Nordic countries sparked by incidents like the Three Mile Island accident in 1979. Moreover, the NKA was increasingly viewed as a controversial political actor functioning as 'a state in the state' promoting nuclear power, and eventually the NKA was dissolved after the Chernobyl disaster in 1986. However, the research branch of the NKA, the NKS, survived and the NKS is still an important part of Nordic cooperation in the nuclear safety sector.

The other track of cooperation gained importance in 1959 when the NCM recommended cooperation between the Nordic radiation protection authorities. The initiative encouraged regular expert meetings starting in 1961 and an agreement on early warning in case of an accident. While Iceland was not part of this agreement in the beginning, they joined in 1965. Initially, the cooperation addressed questions related to radioactive fallout, which was a major concern in the Nordic countries due to the culmination of nuclear bomb tests during the 1950s. The result was a joint Nordic statement on the matter and cooperation expanded and further evolved through the development of the Nordic Flag Books, dealing with international recommendations on radiation protection adapted to Nordic conditions. The first flag book from 1976 marked a significant contribution toward a common Nordic view on radiation protection. From the beginning, the Nordic countries had separate authorities for radiation protection and nuclear safety, and

these authorities only interacted sporadically. However, the first directors meeting with representatives from both the radiation protection authorities and nuclear safety authorities was held in 1977, establishing the chiefs meeting with its working groups. In contrast to the cooperation through the NKA, the cooperation between the authorities strengthened after Chernobyl and led to the establishment of the NEP. Furthermore, the cooperation withstood the Fukushima accident in 2011, and the development of the newest flag book from 2014 shows that the cooperation between the Nordic Authorities continues to be important and influential:

> The cooperation between the authorities was smooth and unconstrained by political influence, while the NKA was approaching the end. The authorities were praised for their handling of the impact of the Chernobyl accident, and the cooperation between the authorities continues to be very useful to this day. (Interviewee 5)

In the years after the Second World War, there was no established European cooperation between national authorities in the nuclear safety sector. However, in 1999, the Western European Nuclear Regulators Association (WENRA) was established, and in 2007 the Heads of the European Radiological Protection Competent Authorities (HERCA) was created. The WENRA deals with questions related to nuclear power plants and mainly nuclear safety issues, while The HERCA revolves around radiation protection. The data suggests the importance of both organizations, however in distinct ways. On areas where there is no established Nordic cooperation, like nuclear safety, cooperation in other arenas will be increasingly important for the authorities. Thus, on issues of nuclear safety, cooperation through the WENRA is highly important as the only organization of its kind in Europe:

> I think to some extent it has happened on nuclear safety, where we don't have that much cooperation in the Nordic countries as we have on radiation safety. And the reason is that on the nuclear safety area, we have WENRA for instance. So, we already work together very effectively and efficiently, and the goals of WENRA are aligned with our goals and the Nordic countries goals, so we don't need to have a specific cooperation forum within the Nordic countries. (Interviewee 1)

Regarding radiation protection, the Nordic cooperation was established and successful long before the HERCA was founded, and the data suggests that cooperation through the HERCA has not diminished cooperation through the chiefs meeting. The data also indicates that the Nordic authorities use the established Nordic cooperation to coordinate opinions and Nordic statements to gain leverage at the international level. Thus, Nordic cooperation on radiation

protection also serves as a resource and coordination platform toward other organizations where the Nordic authorities are present:

> One thing is to make our work more influential and more effective nationally, but at the international level, when we participate in certain international meetings, we first discuss within the Nordic countries. Then we might find that we all agree, and then we have more leverage to put forward certain opinions that we share. Usually we share most of the opinions, so it is quite easy to work within the Nordic countries. So, I think that at least these two points are very important in the Nordic cooperation: We have more leverage at the international level, and we can work more efficiently at the national level if we combine all our resources. (Interviewee 2)

The brief historical outline above suggests that the cooperation between the Nordic authorities on radiation protection succeeded in contributing to the development of radiation protection in the Nordic countries and also internationally by developing a common Nordic understanding manifested through joint statements and the flag books. The data thus suggests that the combination of longstanding roots and success in achieving its goals are important for explaining the highly integrated cooperation on radiation protection. As one interviewee put it: "The Nordic cooperation has been around for a long time, and it has been very influential. So, many international practices came from the Nordic groups originally, and there are several active groups on different areas" (Interviewee 2). Moreover, important critical junctures, like Chernobyl, strengthened the cooperation and it displayed robustness in its capacity to withstand and survive external shocks. The data indicates that Nordic cooperation on radiation protection also displays robustness toward changes in the organizational environment, where the cooperation upholds its important role despite new actors like the HERCA. Thus, the historical context of the cooperation makes it plausible to assume that self-reinforcement dynamics are in place, making deviation from the existing path and pattern of cooperation less likely.

Regarding Nordic cooperation through the NKA, history shows that cooperation on issues more directly related to nuclear power plants—like questions of nuclear energy, nuclear safety, and nuclear security—are more politically contested and thus more difficult to maintain over time at the Nordic level. The cooperation through the NKA was also driven by officials from the ministries, while the experts from the authorities played a minor role. The data thus indicates that the proximity to the political level may have made cooperation more turbulent. Furthermore, a series of small and large critical junctures and incremental evolvements of the organization—like the growing skepticism to nuclear power, the declining transparency of the NKA, and the Three Mile Island accident—created an environment where, eventually, the NKA was not able to withstand the external shock of the Chernobyl accident. After the dissolvement of the NKA, other actors

like the WENRA have gained influence in the field of nuclear safety, and the data suggests that path dependent mechanisms makes Nordic cooperation on nuclear safety comparable to the one on radiation protection, redundant. Thus, by studying Nordic cooperation in the nuclear safety sector after the Second World War, proposition one (#1) holds. It shows the relevance of path dependency through positive feedback and critical junctures for understanding why cooperation on radiation protection and emergency preparedness is highly integrated at the Nordic level, compared to cooperation on issues of nuclear safety, security, and safeguards.

Considering the size variable, the Nordic authorities differ considerably in terms of how many employees the organizations have (see Table 2).

Table 2. Number of employees in the national authorities.

	Iceland	Denmark	Norway	Sweden	Finland
Employees	10	13 * 40 **	120	300	333

Notes: * The Nuclear Department, ** The Radiation Protection Unit (SIS).

The main proposition regarding size is that the largest organizations integrate into Nordic cooperation to a lesser degree than smaller structures. However, considering the most integrated part of the Nordic cooperation—cooperation on radiation protection and emergency preparedness—the data shows that all the authorities are equally committed, and they all perceive the cooperation to be important for their own organization:

> I would say that the Nordic cooperation is extremely important! First of all, international cooperation is very important. For a small expert organization, it is really the only way in which you can secure and maintain competence for the staff. It is easy to get stuck when you are in a small country and you are the only organization dealing with something. So international cooperation is extremely important. But to me, the most important cooperation internationally is the Nordic cooperation. I consider the Nordic cooperation to be extremely important, and I think it is quite clear that the Nordic cooperation has improved radiation safety in the Nordic countries. (Interviewee 5)

A possible explanation is that both the Swedish and the Finnish interviewees describe their organizations as small and with limited resources. Thus, since small organizations need to build capacity through cooperation to be able to carry out their tasks, the proposition holds (#2). The size of an organization also indicates

degrees of autonomy and the capacity to initiate policies, develop alternatives, implement decisions, and monitor compliance (Egeberg & Trondal, 2018, p. 7). The data suggests that the largest authority, the Finnish STUK, has a more active and pronounced agenda toward influencing other actors, also at the international level:

> I would say that the Finns are the very best. Exactly what their strategy is, I wouldn't know, but I do know that if you look at the international context, you will almost always find a very skilled and talented Finn in different arenas, and it is quite typical that they are very accomplished within our field. (Interviewee 6)

Regarding the horizontal specialization of the Nordic authorities, the data indicates that there is less cooperation and integration between the Nordic authorities on the core-state portfolios of security and safeguards compared to the non-core portfolio of radiation protection. One possible explanation is that the foundation for such cooperation is lacking since these questions are more relevant in countries with nuclear power plants. However, the data suggests that the lack of cooperation is first and foremost related to the characteristics of security and safeguards issues. Security issues are marked by secrecy, and except some interaction between the SSM and the STUK, cooperation is scarce: "These security people are very strict, and sometimes they don't want to discuss, and because of these sensitive issues, they cannot really share information like in the safety area. You cannot compare their practices" (Interviewee 3). And: "Security is different. You can't talk about it because it's confidential, and that's why it's more difficult in the international forums" (Interviewee 1). The same follows for issues related to safeguards, which in general are described as 'political,' where the main cooperation is channeled through the Ministries of Foreign Affairs and the IAEA. The data thus shows few signs of joint Nordic cooperation within both the areas of security and safeguards:

> Safeguards are more political. There is much more political influence also at the technical level in this area. There is North Korea and Iran and India. Pakistan, Israel….So, it easily becomes kind of high-level political discussions even at the technical level. (Interviewee 4)

Consequently, different parts of the authorities will be integrated into a Nordic cooperation to different degrees, where units and personnel working on issues related to security and safeguards will be least integrated. The data thus supports both propositions related to the horizontal specialization of the Nordic authorities where, first, there is less cooperation on core-state portfolios (#3), and secondly, the cooperation follows departmental lines, where units with shared sector affiliation tend to cooperate (#4). This leads to quite different patterns of cooperation and explains why there is not just one Nordic cooperation within the nuclear safety sector and between the national authorities. Rather, there are different arenas for cooperation which differ in their degree of integration. Furthermore, the data suggests that the difference in degree of integration partly is

caused by the characteristics of core-state portfolios and non-core portfolios, where cooperation on core-state portfolios is more challenging to establish and maintain.

Furthermore, the five Nordic authorities differ in regard to both the vertical and the horizontal specialization, and the structure in Denmark stands out compared to the other four authorities. Horizontally, Iceland, Norway, Sweden, and Finland each have one agency working on issues of both nuclear safety, security, and safeguards. In Denmark, however, these policy areas are divided into two different units where the SIS mainly deals with issues of radiation protection, while the Nuclear Department focuses their work on issues of nuclear safety, security, safeguards, and emergency preparedness. Vertically, the SIS and the Danish Nuclear Department are not independent agencies, but the SIS is a department in the Danish Health Authority, while the Nuclear Department is part of the Danish Emergency Management Agency. Hence, the portfolio of the nuclear safety sector is divided between two units which serve as departments in two different agencies subordinated to different ministries. The other four Nordic authorities are independent agencies formally subordinated to one ministry, except the DSA which is formally subordinated to three different ministries. Considering the integrated Nordic cooperation on radiation protection and emergency preparedness, the data suggests that all the national agencies and the two departments in Denmark are equally involved. One explanation is that the interviewees experience autonomy toward parent ministries and overarching agencies based on their specific knowledge and expertise: "Historically speaking, we are the experts and we have the necessary knowledge which the ministry basically lacks" (Interviewee 10). Also:

> People have their own tasks and it's quite individual what you are working on. I have projects and activities I manage myself, and professionally speaking, I am the expert within my field, so, there is nobody else who has much to object or to say. (Interviewee 30)

Thus, the findings show that the authorities perceive contact with epistemic communities and experts as fundamental for the functioning of the organization:

> It's important to have the international focus. So, if we turn it around: How would we manage if we didn't work internationally? It wouldn't have worked at all!….Remember, it is a small area of expertise. So, we who work within DSA would need to have very good justifications if we were to regulate radioactivity, radiation, and emissions in a completely different way than our international partners. (Interviewee 23)

> But a great deal of the input we get on things that are important to us often originates from international arenas: international conferences and organizations. We take home what is necessary, and these inputs provide important premises for our further work. (Interviewee 24)

Hence, the data indicates both leeway for expert concerns and the importance of cooperation between expert bodies. The data therefore shows few signs of differences in the engagement within Nordic cooperation due to differences in the vertical specialization between different authorities (#5).

Conclusion and Outlook

This study finds that the cooperation between the Nordic authorities in the nuclear safety sector is differentiated between the highly integrated areas of radiation protection and emergency preparedness, whereas the areas of nuclear security and safeguards is marked by low degrees of integration. To understand this variation, the article unpacks the cooperation itself by asking why these differences occur within the same sector and between the same actors. The findings suggest the importance of path dependency by highlighting two different path dependent mechanisms. First, positive feedback makes deviation from existing paths less likely, and secondly, critical junctures display the robustness of the cooperation when confronted with external shocks and changes. Thus, the longstanding history and success of the Nordic cooperation on radiation protection and emergency preparedness contributes to explaining why this cooperation upholds its importance. It also confirms Olsen and Sverdrup's (1998, p. 26) suggestion that longstanding Nordic networks, grounded in professions and located in the state administration, may be more robust toward external changes than Nordic cooperation, which lacks these characteristics. The findings also correspond to the division between non-core portfolios and core-state portfolios, where integrated cooperation on core-state portfolios are more difficult to establish and maintain than cooperation on non-core portfolios. Cooperation on core-state portfolios is a hard case and the findings in this study confirm this notion.

The study reflects organizational-institutional approaches to political science by suggesting that governance systems and practices under stress may revert to or strengthen established organizational traditions, practices, and formats, reinforcing institutional path-dependencies (Gänzle et al., 2020, p. 15). Thus, crises may produce critical junctures that generate 'windows of opportunity' for more integrated cooperation. The study shows under which conditions crisis and external shocks might lead to either more integrated cooperation or its breakdown. Furthermore, the study adds to the organization theory-based institutional approach in public administration research highlighting how national expert authorities, placed in the state administration, are partly autonomous institutions where a great deal of what is important originates from epistemic communities. Moreover, the findings offer insight into how cross-territorial cooperation between

functionally similar authorities at the same level function and evolve over time, highlighting how they manage to pool and exploit common resources across territories. Finally, this study contributes to the study of differentiated integration (Gänzle et al., 2020) by showing how national authorities and agencies act as incoherent wholes where patterns of cooperation and degrees of integration vary within the same authority.

References

Anderies, J. M., Folke, C., Walker, B., & Ostrom, E. (2013). Aligning key concepts for global change policy: Robustness, resilience, and sustainability. *Ecology and Society*, *18*(2).

Balle Hansen, M., Lægreid, P., Pierre, J., & Salminen, A. (2012). Comparing agencification in the Nordic countries. In G. Bouckaert, P. Lægreid, K. Verhoest, & S. van Thiel (Eds.), *Government agencies: Practices and lessons from 30 countries* (pp. 259–264). Basingstoke: Palgrave Macmillan.

Bankes, S. (2010). *Robustness, adaptivity, and resiliency analysis.* Paper presented at the Association for the Advancement of Artificial Intelligence Fall Symposium, Arlington, VA, USA.

Buchana, Y., Garbutt, M., & Seymour, L. F. (2018). Identifying micro-level generative mechanisms of ICT-enabled performance improvement in resource-constrained healthcare organisations: A critical realist perspective. *The Electronic Journal of Information Systems in Developing Countries*, *84*(6), 1–11.

Capano, G., & Woo, J. J. (2017). Resilience and robustness in policy design: A critical appraisal. *Policy Sciences*, *50*(3), 399–426.

Collier, R., & Collier, D. (2002). Framework: Critical junctures and historical legacies. In R. Collier & D. Collier (Eds.), *Shaping the political arena: Critical junctures, the labor movement, and regime dynamics in Latin America* (pp. 27–39). Notre Dame, IN: University of Notre Dame Press.

Egeberg, M., & Trondal, J. (2018). *An organizational approach to public governance: Understanding and design.* Oxford: Oxford University Press.

Fioretos, K., Falleti, T., & Sheingate, A. (2016). Historical institutionalism in political science. In K. Fioretos, T. Falleti, & A. Sheingate (Eds.), *The Oxford handbook of historical institutionalism*. Oxford: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199662814.013.1

Gänzle, S., Leruth, B., & Trondal, J. (2020). Differentiation, differentiated integration and disintegration in a 'post-Brexit-era.' In S. Gänzle, B. Leruth, & J. Trondal (Eds.), *Differentiated integration and disintegration in a post-Brexit era* (pp. 1–25). London: Routledge.

Genschel, P., & Jachtenfuchs, M. (2014). Introduction: Beyond market regulation. Analysing the European integration of core state powers. In P. Genschel & M. Jachtenfuchs (Eds.), *Beyond the regulatory polity? The European integration of core state powers* (pp. 1–23). Oxford: Oxford University Press.

Holst, C., & Gornitzka, Å. (2015). The expert-executive nexus in the EU: An introduction. *Politics and Governance*, *3*(1), 1–12.

Jacobsen, D. I. (2017). Governance at the local level: A research agenda on cross-boundary coordination. In J. Trondal (Ed.), *The rise of common political order* (pp. 197–216). Cheltenham: Edward Elgar Publishing.

Keast, R., & Mandell, M. (2014). The collaborative push: Moving beyond rhetoric and gaining evidence. *Journal of Management & Governance*, *18*(1), 9–28.

Keohane, R., & Nye, J. S. (1974). Transgovernmental relations and international organizations. *World Politics: A Quarterly Journal of International Relations*, *27*(1), 39–62.

Knutsen, O. (2017). Introduction: The nordic models. In O. Knutsen (Ed.), *The Nordic models in political science: Challenged, but still viable?* (pp. 9–18). Bergen: Fagbokforlaget.

Krick, E., & Holst, C. (2020). The socio-political ties of expert bodies: How to reconcile the independence requirements of reliable expertise and the responsiveness requirement of democratic governance. In E. Krick & C. Holst (Eds.), *Experts and democratic legitimacy: Tracing the social ties of expert bodies in Europe* (pp. 1–16). New York, NY: Routledge.

Lægreid, P. (2018). Nordic administrative traditions. In P. Nedergaard & A. Wivel (Eds.), *The Routledge handbook of Scandinavian politics* (pp. 80-91). London: Routledge.

Lægreid, P. (2020). Public administration research in Norway: An organisational and institutional approach to political organisations. In G. Bouckaert & W. Jann (Eds.), *European perspectives for public administration* (pp. 421-438). Leuven: Leuven University Press.

Lægreid, P., & Rykkja, L. (2015). Organizing for "wicked problems": Analyzing coordination arrangements in two policy areas. *International Journal of Public Sector Management*, *28*(6), 475–493.

Nedergaard, P., & Wivel, A. (2018). Introduction: Scandinavian politics between myth and reality. In P. Nedergaard & A. Wivel (Eds.), *The Routledge handbook of Scandinavian politics* (pp. 80–91). London: Routledge.

Olsen, J. (2018). The Bergen approach to public administration and political organization. *Norsk Statsvitenskapelig Tidsskrift*, *34*(4), 188–206.

Olsen, J., & Sverdrup, B. (1998). Europa i Norden [Europe in the Nordic region]. In J. Olsen & B. Sverdrup (Eds.), *Europa i Norden: Europeisering av nordisk samarbeid* [Europe in the Nordic region: Europeanisation of Nordic cooperation] (pp. 10–33). Oslo: Tano Aschehoug.

Pierson, P. (2000). Increasing returns, path dependence, and the study of politics. *The American Political Science Review*, *94*(2), 251–267.

Sanders, E. (2006). Historical institutionalism. In R. Rhodes, S. Binder, & B. Rockman (Eds.), *The Oxford handbook of political institutions* (pp. 39–55). Oxford: Oxford University Press.

Slaughter, A. (2004). *A new world order*. Princeton, NJ: Princeton University Press.

Smith, C., & Elger, T. (2014). Critical realism and interviewing subjects. In P. K. Edwards, J. O'Mahoney, & S. Vincent (Eds.), *Studying organizations using critical realism* (pp. 109-131). Oxford: Oxford University Press.

Steinmo, S. (2008). Historical institutionalism. In D. Della Porta & M. Keating (Eds.), *Approaches and methodologies in the social sciences: A pluralist perspective* (pp. 118–138). Cambridge: Cambridge University Press.

Thelen, K. A., & Mahoney, J. (2010). A theory of gradual institutional change. In K. A. Thelen & J. Mahoney (Eds.), *Explaining institutional change: Ambiguity, agency, and power* (pp. 1-37). Cambridge: Cambridge University Press.
van Oss, L., & van 't Hek, J. (2011). *Why organizations fail? Robustness, tenacity, and change in organizations*. London: Routledge.

Verhoest, K., & Bouckaert, G. (2005). Machinery of government and policy capacity: The effects of specialization and coordination. In M. Painter & J. Pierre (Eds.), *Challenges to state policy capacity: Global trends and comparative perspectives* (pp. 92-111). Basingstoke: Palgrave Macmillan.

Verhoest, K., van Thiel, S., Bouckaert, G., & Lægreid, P. (2012). Introduction. In G. Bouckaert, P. Lægreid, K. Verhoest, & S. van Thiel (Eds.), *Government agencies: Practices and lessons from 30 countries* (pp. 3–17). Basingstoke: Palgrave Macmillan.

Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society*, *9*(2).

Article 3: Global Governance and inter-organizational relationships in the Nuclear Safety Sector

Abstract

In response to global challenges the interconnectedness between different organizations is seen as the *sine qua non*, and one of the most important aspects of the organizational environment is cooperation and conflicts between organizations. This paper aims at contributing to an emerging 'inter-organizational turn' in world politics by studying the relationship between the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), and the International Atomic Energy Agency (IAEA), and the paper suggests that inter-organizational cooperation and conflict are based on flows of information, trust, resource dependencies, and how responsibilities and roles are divided between organizations. Moreover, the paper indicates that organization type and organization size are important to understand patterns of cooperation and conflicts between organizations operating at the global level. The paper also suggests that organizational birthmarks are important to understand why tensions are triggered.

Introduction

"What makes the world hang together?" John Ruggie famously asked and contributed to the pursuit of understanding how the world is governed, ordered, and organized (1998: 1; Barnett and Finnemore, 2004: 10; Weiss and Wilkinson, 2018: 11). In response to global challenges, the interconnectedness between different actors is seen as the *sine qua non* and scholars are encouraged to focus on relationships between global organizations (Biermann and Koops, 2017: 2, 5 and 13; Finnemore, 2014; Legrand, 2019; Lipson, 2017: 67; Stone and Ladi, 2015; Weiss and Wilkinson, 2018: 13). Studies suggest that one of the most important aspect of the organizational environment is cooperation and conflicts between organizations, and therefore, scholars must examine how and why organizations both clash—and cooperate (Biermann and Koops, 2017: 19; Karns et.al., 2015: 67; Schneiker, 2017: 321). Arguably, cooperation between key global organizations is essential in order to promote common understandings and policy harmonization across the globe, while conflicts may lead to policy fragmentation and a lack of common understandings with important consequences for practises at the regional and national level. This paper strives to contribute to the emerging "inter-organizational turn" in world politics (Biermann & Koops, 2017: 1) where organizations and the relationships between them are treated as more than mere instruments of states (Franke, 2017). Consequently, organizational characteristics are important, and the paper shows

how organizational type, size, and birthmark affect inter-organizational relationships at the global level.

This paper asks: What shapes cooperation and conflict between organizations at the global level, and why do conflicts arise between organizations with a longstanding history of cooperation? The paper studies the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), and the International Atomic Energy Agency (IAEA)—which are the most influential global actors dealing with safety issues in the nuclear safety sector. The nuclear safety sector is divided into three different pillars: safety, safeguards, and security. Safety is defined as the protection of people, environment, and society from the consequences of radiation. It includes radiation protection, emergency preparedness, and nuclear safety, which deals with how to operate nuclear facilities to avoid accidents. Safeguards refer to ensuring that nuclear material, technology, and information is used for peaceful purposes, and it thus includes arms control and non-proliferation. Finally, security is linked to both safety and safeguards, and it is mainly about protecting nuclear facilities from terrorism, and how to avoid theft of nuclear material, technology, and information.

The three organizations included in this study vary according to the independent variables of organization type, size, and birthmarks, and they are essential in order to create safety recommendations and standards with vast consequences for safety practices, rules, and laws at the regional and national level. These organizations, and the relationship between them, provide an opportunity to study why tension arise between organizations with a longstanding history of cooperation. Moreover, choosing actors within one sector enables some degree of controlling for noise stemming from other policy sectors. In short, the UNSCEAR is a scientific committee in the United Nations (UN) system, and its main objective is to assess and report levels and effects of radiation. The members of the UNSCEAR are states, however, these states are not represented by politicians, but rather by national experts. Moreover, the UNSCEAR has a small separate secretariat, and hence, the UNSCEAR possesses traits of both inter-governmental organizations (IGOs) and expert bodies. The ICRP is a non-governmental organization (NGO) and an expert body providing recommendations and guidance on all aspects of radiation protection. The IAEA is an IGO with a broad portfolio. However, a core task is to develop and publish global safety standards.

This article suggests that inter-organizational cooperation at the global level is based on continuous flows of information, high trust, resource dependencies and a clear separation of tasks and responsibilities within a shared issue area (see Table 1). To account for variation in patterns of cooperation and conflict, the paper studies the impact of organization type, size, and birthmarks on inter-organizational relationships. In doing so, the paper highlights two basic assumptions. First, organizations matter, and this research underscores the role of

organizational variables to understand inter-organizational relationships at the global level (Olsen, 2018a). Secondly, history and context matter, and scholars have emphasized the essential role of history and the problems of universal, non-contextual explanations (Lægreid, 2020: 424; Olsen, 2018a). As different organizations are located differently in time and space, one must ask how the past affects the future and how organizations learn—or not—from experience and changing environments (Olsen, 2018a). Moreover, scholars argue that there is a need to study the links between the historical development of cooperation and conflicts, as well as organizational forms and processes (Olsen, 2018a).

This present work contributes to three main literatures. First, it contributes to bridge the gap between studies of international organizations (IOs) and organization theory. Traditionally the relationship between these two strands of literatures have been marked by mutual neglect (Jönsson, 2017: 50). However, it has been argued that organization theory is a powerful instrument for approaching governance as organizational factors are expected to create biases in governance processes, making some choices more likely than others (Egeberg & Trondal, 2018: 1–4; Lægreid, 2020: 422). This paper shows how variables like organization size affect relationships between organizations. Secondly, the paper speaks to literature on international public administration (IPA) by highlighting the vital role of international bureaucracies in global governance. In doing so, the paper does not expect IOs to act as coherent wholes: studies suggest that non-elected bureaucrats may use their central position, privileged access to information, technical expertise, and professional authority to influence global governance (Bauer & Ege, 2016). This paper shows how international secretariats are important for information sharing and trust between organizations, and thus they influence degrees of cooperation and conflict between them. Thirdly, cooperation between IGOs and NGOs is not very well explained (Steffek, 2013) and achieving policy coherence and synergies between IGOs and NGOs have been identified as one of the core challenges of global governance (Biermann & Koops, 2017: 2). Moreover, IGOs may be defined as "meta-organizations" (Ahrne and Brunsson, 2005), while NGOs like the ICRP, are not. This paper thus indicates that differences between IGOs and NGOs related to the members of the organizations, contribute to our understanding of what shapes relationships between IGOs and NGOs.

The article proceeds as follows. Section two presents the theoretical framework in two steps: first, cooperation and conflicts are conceptualized. Secondly, the independent variables are presented including propositions and expectations. Next, section three introduces the method and data, while section four presents the empirical findings. Finally, section five summarizes key findings and suggests contributions to the literature.

Theoretical framework

There is a growing interest in studying cooperation among international organizations (IOs) (Biermann and Koops, 2017: 1-2). However, scholars propose that cooperation is always accompanied by the potential for conflicts and the default condition between organizations is not necessarily harmony (Biermann and Koops, 2017: 20). In order to conceptualize both cooperation and conflicts between organizations, this paper draws on inter-organizational relations (IOR) literatures. The study of IOR is focused on understanding different aspects of inter-organizational relationships, such as their origins, patterns, and consequences (Cropper et.al., 2008: 4), and inter-organizational theorists, study how and why organizations both cooperate and compete (Karns et.al., 2015: 68).

In this paper *cooperation* is conceptually unpacked by four different proxies. First, cooperation is recognized by continuous flows of information and the interplay between organizations is thus focused on information sharing to ensure cooperation and to avoid misunderstandings and tensions. The sharing of information may then reflect a common interest among organizations, and information-sharing behaviour is employed as an approach to strengthen relationships between information givers and receivers (Yang and Maxwell, 2011). Secondly, scholars argue that successful organizational relations over longer periods of time, is recognized by high degrees of trust. Trust, therefore, is a response to the problem of complexity and uncertainty in social interactions (Bachmann et. al., 2001; Brugger et.al., 2017: 407; Costa et.al., 2018; Fulmer & Gelfand, 2012; Paliszkiewicz, 2011). Moreover, trust may be grounded in an assessment of an actor's motivation and/or competence (Brugger et.al., 2017: 409). Here, the argument states that high trust is an essential part of well-functioning cooperation, while low trust is a core feature of conflicts.

Thirdly, resource dependency theories suggest that resource exchange is the core activity in inter-organizational relations (Biermann and Koops, 2017: 9; Hillman et.al., 2009), and that organizations are drawn into inter-organizational relationships because they need resources (Van de Ven, 1976). Hence, organizations will cooperate to achieve goals and reap mutual benefits (Laimer, 2015; Oliver, 1990). Organizations are especially affected by scarcity of resources, such as personnel, finances, information, knowledge, and expertise (Karns et.al., 2015: 68; Schneiker, 2017: 325-326). However, organizations need more than these resources if they are to survive (Scott, 2008: 59). Hence, another type of resource organizations need, is authority. Globally, authority can be divided into two basic types, namely political and epistemic authority (Zürn, 2017). Political authority rests on the acknowledgment that the world need institutions that are authorized to make collectively binding decisions to promote the common good and to prevent chaos. On the other hand, epistemic authority is based on expert knowledge and moral integrity, and the perspectives and views of an authority are adopted because the actor appears to be both well-informed and nonpartisan at the same time (Zürn, 2017). Lastly, cooperation is linked to

tasks and responsibilities. If organizations, operating within the same issue-area, have distinct tasks and responsibilities, they are more likely to need each other in order to achieve their goals. Thus, the output of one organization might be important input for another organization (Alexander, 1995: 31), and interdependent processes might emerge through the division of tasks and functions between organizations (Van de Ven 1976). Consequently, actors might agree upon a division of labour to avoid conflicts and costs related to duplication of tasks and responsibilities (Biermann and Harsch, 2017: 139).

This paper suggests that cooperation and conflicts in inter-organizational relationships are at the opposite ends of a continuum, and *conflicts* are thus recognized through a lack of cooperation, meaning no flow of information, low trust, an overlap of resources, and a duplication of tasks and responsibilities. No flow of information may imply a passive position or a position of active information protection. Low degrees of trust imply questioning an actor' motivation and/or competence, and it may hamper cooperation as well as provoke conflict. Organizations may also compete over resources, and thus attempt to increase their relative position in the field by showing differences in strength (Reinalda & Kille, 2017: 217). Lastly, a duplication of tasks and responsibilities may lead to domain conflicts. Domain conflicts are a consequence of organizations encroaching on the domain of others, often via duplication of output, mandates, or tasks, stimulating domain-protective measures, turf battles or conflicts by affecting the relevance of the other organization (Biermann and Harsch, 2017: 139; Biermann and Koops, 2017: 7). On this basis, tensions arise in inter-organizational relationships due to decreasing degrees of cooperation, and tensions may lead to conflicts.

Table 1. Conceptualization of cooperation and conflicts in inter-organizational relationships

Cooperation	Conflicts
Continuous flows of information.	No flow of information.
High trust.	Low trust.
Distinct resources other organizations need.	Overlap of resources.
Clear separation of tasks and responsibilities.	Duplication of tasks and responsibilities.

To account for variation, this article studies the impact of organization type, size, and birthmarks on patterns of cooperation and conflict. These variables reflect variation between the three organizations under study and they are derived from the empirical findings. In the following sections, the independent variables are presented.

First, organization type may influence relationships between organizations, and this paper focuses on relationships between IGOs, NGOs, and expert bodies. The main differentiating feature between IGOs and NGOs is that the members of an IGO are states, while members of NGOs are individuals (or associations) (Charnovitz 2011). IGOs may thus be characterized as "meta-organizations" where the members of the organizations are other organizations and states (Ahrne and Brunsson, 2005; Jönsson, 2017: 62). Consequently, IGOs rely to a great degree on their member states, while NGOs are independent of governments, and they rely on their individual members and donors. The core components of expert bodies are specialized knowledge coupled to organizational autonomy. These bodies operate at an arm's length from governmental control, at a minimum, and at the same time the workforce is characterized by highly educated and skilled experts (Krick & Holst, 2020: 1-2). Expert bodies are also targeted toward the expectations of well-informed experts in their field, and they must perform to retain the approval of expert observers (Boswell, 2017: 31). These differences create some expectations regarding how these types of organizations relate to each other. First, member state concerns about organizational autonomy will typically prevent IGOs from engaging in close forms of inter-organizational cooperation (Biermann and Harsch 2017: 146). Moreover, studies show that NGOs' access within and across international organizations is highly constrained by state concerns with national sovereignty (Tallberg et.al., 2013: 3). NGOs on the other hand, have more freedom of action and will seek cooperation toward relevant decision makers and policy forums (Schneiker, 2017: 320 and 326). Thus NGOs may have strong incentives to cooperate with IGOs and other NGOs, and NGOs rarely work alone for very long (Karns et.al., 2015: 244). Secondly, meta-organizations like IGOs, are more autonomous and have access to more resources—such as finances, expertise, personnel, and information—compared to organizations with individuals as members, because organizations concentrate resources (Ahrne and Brunsson, 2005: Jönsson, 2017:62). Member states also supply political support and potentially fuel IGOs with political authority. NGOs and expert bodies, on the other hand, may hold epistemic authority but they must take responsibility themselves for ensuring the resources needed. Hence, IGOs are less vulnerable when it comes to resources compared to NGOs, and IGOs will also inherently hold resources other organizations need and desire. Thirdly, organizational specialization has important implications for inter-organizational cooperation, and functional overlap increase the potential for domain conflicts (Biermann & Harsch, 2017: 139). In sum this leads to three propositions:

> P1: IGOs will be less involved in information-sharing compared to NGOs, and the ICRP will have less access to important forums in the IAEA, compared to the IGOs access to the ICRP. Therefore, the expectation is that ICRP will take more initiatives toward giving access to and sharing information with the UNSCEAR and the IAEA, than the other way around.

P2: IGOs are less dependent on resources NGOs hold, compared to NGOs dependence on IGOs resources. The UNSCEAR is not a typical IGO, and the expectation is thus that the IAEA, in particular, is less involved in conflicts and competition over resources compared to the ICRP.

P3: The same type of specialized organizations (like expert bodies) operating within the same issue-area, are more likely to duplicate each other's tasks and responsibilities. The expectation is thus that domain conflicts will develop more easily between the UNSCEAR and the ICRP, compared to conflicts toward the IAEA.

Furthermore, the size of an organization, measured in staff and budgetary size, supply capacity for organizations to act (Egeberg & Trondal, 2018: 7). Consequently, large organizations are less dependent on other actors to carry out their tasks, and are more autonomous than smaller organizations. Organizations that do not dispose of many resources, in terms of staff and money, may consequently seek to work together with organizations better equipped to achieve their goals (Schneiker, 2017: 326). Two propositions follow:

P4: Small organizations, like the UNSCEAR and the ICRP, will more actively seek cooperation toward big organizations, like the IAEA, compared to big organizations seeking cooperation with small organizations.

P5: Big organizations have more capacity to interact with other organizations, and the expectancy is that flows of information will be easier to uphold in the relationship involving the IAEA, compared to flows of information between the UNSCEAR and the ICRP.

Lastly, all organizations have their birthmarks, and they are thus marked by the time in history at which they arrive and the ideas and resources available at that time (Olsen, 2018b). Moreover, organization characteristics at the time of their founding tend to stick and carry over into the future (Gornitzka and Sverdrup, 2011). Consequently, the basic structure of an organization will remain relatively stable (Stinchcombe, 1965: 153), and through institutionalization, organizations create coordination mechanisms and communication channels which persist (Marquis and Tilcsik, 2013; Scott, 2008: 124). Arguably, based on individual organizational birthmarks, relationships between organizations also have their own birthmarks. Combined, these birthmarks are key to understanding cooperation and conflicts in inter-organizational relationships. One proposition follows:

P6: Organizations carry the marks of their initial ideas and resources, and it will impact cooperation and conflicts between organizations. The expectancy is thus that patterns of cooperation and conflicts between organizations observed today, will correspond to the ideas and resources

available at both the inception of organizations themselves and at the establishment of inter-organizational relationships.

Method and data

To unpack the relationship between the UNSCEAR, the ICRP, and the IAEA, this study benefits from an original dataset based on a qualitative research method. Qualitative methods encompass rich and detailed data which may provide deep understanding. Moreover, interviews open a window into the perceptions of interviewees, their experiences and underlying processes, which can create a better understanding of complex social realities (Buchana et.al., 2018; Smith & Elger, 2014: 119). The empirical findings of this paper are based on interviews with experts and supplemented by documents. These experts represent an elite group, and scholars discuss the difficulties with studying elites in general, by emphasizing obstacles like gated communities and power imbalances (Mikecz, 2012; Petintseva et.al., 2019). When adding the complexity of distance, where elites are situated across the globe, data gathering poses a real challenge. To overcome such obstacles, studies suggest that qualitative research methods may be the best alternative to gain access to data (Harrington, 2017: 39).

The interview data consists of three datasets. The first set comprises 37 semi-structured expert interviews with officials from the national authorities on radiation protection and nuclear safety in the five Nordic countries, conducted in 2018 and 2019. All interviewees are highly educated and skilled professionals, and all have experience working at the international level. However, some of the interviewees from the Nordic level have extensive international experience, including being members of the ICRP, leading expert groups related to the UNSCEAR, and representing their country in important committees in the IAEA. These 37 interviews were therefore essential to understand the overall global governance structures in the nuclear safety sector, and also to understand the inner workings of all three organizations. The second dataset consists of 10 interviews conducted during the fall of 2020. These interviewees include both experts and staff related to the UNSCEAR, the ICRP and the IAEA, and they were also selected based on their central position and experience. Thirdly, five interviews were conducted during the spring of 2021. These interviews did not include new interviewees, but the interviews provided deepened understanding on "the radon situation," the secretariats of the organizations, as well as cooperation and tensions between the organizations. In sum, the dataset thus consists of 52 interviews, but only 47 individual interviewees.

All the interviews targeted aspects such as contact patterns, perceptions of tasks and roles, and experiences with the relationships between the organizations under study. Moreover, all 52 interviews are important to the findings presented. However, the second and third datasets serve as primary data, combined with the interviews with Nordic experts with specific experience at the global level. The study also benefited from publicly available information from the three

organizations' homepages, with a special emphasis on historical documents. Moreover, Bo Lindell's book series on the history of radiation, radioactivity, and radiological protection has been important, as well as other published articles on the history of the three organizations.

The data is mainly presented at an aggregated level. Most interviews were conducted face-to-face, save for 20 interviews conducted via Skype, Lifesize, and Zoom. All interviews were taped and transcribed, and both historical documents and the transcribed interviews were uploaded to the qualitative data analysis software NVivo. NVivo was especially important in structuring and systematizing the vast amount of data, which was essential in order to analyze the data properly. To preserve their anonymity, each interviewee was assigned an interview code: numbers for Nordic level interviewees and letters for international level interviewees. Drafts of the paper were also sent to all quoted interviewees, and they were invited to offer comments before publishing. Lastly, the data was collected in accordance with the requirements of the Norwegian Centre for Research Data.

Empirical findings

The empirical findings are presented in two main parts. First, the relationships between the UNSCEAR, the ICRP and the IAEA are assessed according to the conceptualization of cooperation and conflicts. In essence, the data suggests that there are two main relationships between the three organizations: the relationship involving the IAEA, and the relationship between only the UNSCEAR and the ICRP. The relationship involving the IAEA is marked by cooperation, while the relationship between the UNSCEAR and the ICRP carries tensions. The data also suggest that these tensions have become more apparent in recent years, compared to earlier stages in the UNSCEAR-ICRP relationship, and in this paper these tensions will be exemplified by "the radon situation." In short, the radon situation stems from the publication of different dose conversion factors from the UNSCEAR and the ICRP, and the main aim is thus to use the radon situation to illustrate the tensions between the UNSCEAR and the ICRP. The situation is described as follows:

> I think the radon situation definitely caused quite a lot of contention at different levels, and quite a lot of contention internationally, because people are like 'UNSCEAR represent the science and we should use their dose conversion factor,' but other people said 'but ICRP makes recommendations for radiation protection, so we should use their dose conversion factor.' And then the IAEA was stuck between a rock and a hard place because which one should they choose? (Interviewee G)

Secondly, variations in the empirical findings are discussed regarding the independent variables of organization type, size, and birthmarks. The data show that all variables contribute to explaining inter-organizational relationships on the continuum between cooperation and conflict. Organization type and size are

central to understanding flows of information, resource distinctiveness and resource dependencies, as well as domain conflicts. Organizational birthmarks, on the other hand, seem to provide a deeper understanding of what may spark tensions between organizations with a longstanding history of cooperation.

In the following sections, the two different relationships will be discussed according to the conceptual model describing cooperation and conflicts. The discussion will be based on how information flows between the organizations, degrees of trust, the distribution and distinctiveness of resources, and the division of tasks and responsibilities. Both traits related to cooperation and conflicts will be discussed simultaneously.

Flow of information

First, regarding flows of information, the relationship involving the IAEA appear to enjoy more continuous flows of information, compared to the relationship between the UNSCEAR and the ICRP. Information sharing is apparent both through formalized structures and through informal channels. Formal flows of information materialize in both direct communication between the secretariats and through mutual representation. The data imply that information sharing through direct communication is much more extensive between the IAEA and the two other organizations, compared to information sharing between the UNSCEAR and the ICRP. Interviewees related to staff-functions describe that communication toward the IAEA may happen daily, including both informal and formal interactions, while communication and information sharing between the UNSCEAR and the ICRP secretariats is generally limited to approximately once every month—or less. However, mutual representation through formalized structures seems to be important, and the data suggest that the organizations enjoy formal relationships to facilitate information sharing. The UNSCEAR and the ICRP are observers to the Commission on Safety Standards (CSS), which is the highest-ranking IAEA committee related to the development of the global safety standards, as well as other relevant IAEA committees. Moreover, the ICRP and the IAEA are observers to the UNSCEAR. The UNSCEAR and the IAEA have formal relations with the ICRP, demonstrated by invitations to participate in strategic discussions and ICRP committee meetings. The ICRP thus emphasizes active participation, contrary to the passive observer. It has also been established an inter-agency committee on radiation safety (the IACRS)—where both the UNSCEAR and the IAEA are members—while the ICRP is an observer. However, the data does not indicate that this is an important arena for information sharing between the UNSCEAR, the ICRP, and the IAEA.

Furthermore, flows of information may also be directed through informal channels, and this is especially apparent between individuals who have, or have had, multiple affiliation across the organizations. As two interviewees note:

> You can have members of the ICRP main commission who are also national delegates to UNSCEAR. So, the information flows both ways and I do not see the overlap as a problem. The overlap ensures that there is continuity that there is a good flow of information. (Interviewee 5)

And:

> At one time the chairman of the committee one [of the ICRP] was also the head of the UK delegation to UNSCEAR. I don't think we ever formally recognized that he could represent us. But there was always a feeling of, well, at least we would know what was going on. We would know if there were problems arising and these problems would then be drawn to our attention. (Interviewee H)

The data suggest that this kind of informal information sharing has been highly important, especially between the UNSCEAR and the ICRP. However, the data also show that there has been a gradual change in recent years, in which there is less informal information sharing between the UNSCEAR and the ICRP now compared to earlier. The radon situation illustrates this relationship well. Interviewees from the ICRP describe that there were hundreds of interactions, mostly informal, between the ICRP and the IAEA where they informed each other on the work they were doing related to the radon situation. On the other hand, interviewees report few attempts of information sharing between the UNSCEAR and the ICRP:

> There is full agreement on the science related to measurements of radon concentrations. But to get from the concentration to the potential of harm, you need to do some modelling and you can do modelling in different ways. I think it's a bit difficult to understand why, in the very beginning when these models were being developed, there was not a closer cooperation between ICRP and UNSCEAR, but it may have to do with the people that were involved. (Interviewee 5)

Trust

Regarding levels of trust, the data indicate that no one questions the competence of the three organizations. The UNSCEAR, the ICRP, and IAEA committees, like the safety standards committees and the CSS, are perceived to both be highly competent and have the best scientists in the world. Trust when it comes to motivations, however, is more nuanced between the organizations, and it is especially evident in the relationships between the UNSCEAR and the ICRP. Moreover, trust in motivations is linked to individuals, and how those with different agendas may influence the workings of an organization:

> I think UNSCEAR produces very good reports, but that's largely regardless of the UNSCEAR meetings. The committee meetings tend to be, I would say, potentially dominated by particular individuals. […] And you know, sometimes you will hear people saying, 'Well, UNSCEAR

have said such and such.' And you say, 'Well, actually, that's you.'
(Interviewee I)

And in relation to the radon situation, one interviewee described the situation as follows:

> And then they [ICRP] came up with a number that was higher than the UNSCEAR - a higher risk! I'm sure if the previous people who had been involved in the lower number were still on ICRP, it wouldn't have been that high, because my understanding was frankly, that it was political and it was linked to uranium mining. (Interviewee H)

The role and influence of the ICRP, as an NGO, is also questioned:

> During the drafting and revision of the IAEA safety standards, the question of the influence of the ICRP has been raised and questioned. So, not everyone at the agency [IAEA] or at the national level is a friend of the ICRP, and some people find it problematic, this marriage to ICRP. […] And the question has been raised several times: How is it possible that an NGO has this enormous influence? Is it acceptable? (Interviewee 5)

IGOs, like the UNSCEAR and the IAEA, are also questioned related to member state interests. This is for instance observed in the work of the CSS:

> The job is to make sure that the safety is maintained regardless of the technology. […] However, certain members of the CSS will come to the CSS with instructions from their capitals to respond to the safety standard. […] So, there will always be a small protective element, or a territorial element, trying to influence the safety standards, and defence of the technology will take place. (Interviewee F)

However, such dynamics do not seem to influence the relationship between the UNSCEAR, the ICRP, and the IAEA. In fact, the data suggest that it is easier to question the motivation of the UNSCEAR and the ICRP, compared to the IAEA, even though some of the same concerns are present in the IAEA. Moreover, the ICRP is also questioned for being an NGO, and the data thus show that it is especially important for the ICRP to appear as trustworthy in order to build relationships with other organizations, as compared to the IAEA where trust might be less important.

Resources

The overall picture is that the UNSCEAR and the ICRP are more dependent on resources the IAEA hold, especially the political authority of the IAEA, compared to resources the UNSCEAR and the ICRP may offer each other. The

UNSCEAR and the ICRP are thus more vulnerable regarding resources, compared to the IAEA. Moreover, all the organizations have some overlap regarding resources such as expertise, knowledge, information, and epistemic authority. At the same time, they differ on finances, staff, and political authority. The UNSCEAR and the ICRP have small budgets and secretariats, but both organizations, and the ICRP in particular, have high degrees of epistemic authority. The IAEA has big budgets, a large staff, and political authority. On a more detailed level, considering resources such as finances and personnel, the data show substantial differences between the organizations. The IAEA is a large organization with a big budget and a staff of roughly 2500 staff members, while the UNSCEAR and the ICRP are small-scale organizations with limited budgets and small secretariats. For instance, the ICRP currently has seven staff members, while the UNSCEAR secretariat consist of nine individuals. Furthermore, small budgets and small secretariats cause certain constraints on the secretariats, and staff in both the UNSCEAR and the ICRP report that they must turn down invitations to participate in meetings, due to a lack of travel budgets and time constraints. Moreover, the UNSCEAR is funded by the UN over a biannual budget, while the ICRP has no, or very limited permanent funding. The secretariats must therefore prioritize according to what they consider to be their core role. The ICRP staff, in particular, emphasize that a big part of their job is to make sure that the ICRP has enough money to operate according to the organization's goals.

Considering other types of resources, the data show that all the organizations hold relevant information, knowledge, and expertise, both in their secretariats and through individual experts invited to participate in both expert and task groups. These resources are also fundamental to the organizations' functioning and for their main tasks. However, the IAEA is the only one of the three with explicit political authority, while they all have some degree of epistemic authority, and epistemic authority is particularly evident in the ICRP:

> The ICRP is not part of the UN, like UNSCEAR and the IAEA. They are not beholden to any government. They are pretty much fully independent, and all their funds come from voluntary contributions. […] A second crucial point, though, is that the ICRP take a lot of care into making good recommendations. If they got into a habit of making bad recommendations, the ICRP would disappear. It would become irrelevant. […] The fact that the ICRP still exist, based on voluntary contributions, means somebody thinks they are doing a good job. […] ICRP provides recommendations and they're only recommendations, just suggestions formally, they have no weight whatsoever in terms of legal weight. So, the IAEA sets standards and recommendations that have some legal weight. (Interviewee A)

Moreover, interviewees describe how the IAEA benefit from the epistemic authority of the ICRP:

IAEA also has an important reason to collaborate with ICRP. The IAEA GC is very politicized, and committee discussions may also be hampered by political influences. By the famous decision to follow ICRP recommendations as far as possible, IAEA has created a way for itself to evade some of the political flak. (Interviewee 7)

The data suggest that there is little, or no tension related to resources in the relationship involving the IAEA. However, there is some tensions between the UNSCEAR and the ICRP related to epistemic authority. Both offer epistemic authority, and it is a trait that is at the very core of the two organizations. Hence, neither of them can afford to jeopardize this authority because it will threaten their very foundations. The radon situation illuminates this tension:

The result of the IAEA-meeting was the development of a joint statement from the UNSCEAR and the ICRP, and the statement did calm the situation down, at least to some degree. However, many felt that the statement could have been even more clear. And actually, it is a joint document, but it's basically just each of them explaining their view. So, in my opinion there is some sort of prestige involved. It's difficult to explain why, but that is my impression. (Interviewee 34)

Moreover:

There is room to change [the ICRP recommendations] if you have new scientific evidence. But if the science is the same, then the concern, the overriding concern, is loss of credibility with the general public. […] Credibility is the single most valuable resource. (Interviewee 5)

The data thus suggests that tensions between the UNSCEAR and the ICRP, are linked to a fear of losing credibility and thus leading to a reduction or loss of the epistemic authority held.

Tasks and Responsibilities

As the data suggest, that there are more blurry lines between the tasks and responsibilities of the UNSCEAR and the ICRP, compared to the lines toward the IAEA, and this causes tensions between the UNSCEAR and the ICRP. In the relationship involving the IAEA, there is a very clear separation of tasks and responsibilities between the UNSCEAR, the ICRP, and the IAEA. Indeed, they all need each other to some degree:

They [the UNSCEAR, the ICRP and the IAEA] could actually not be one without the other. So, if one actor would cease to exist, then the mandate and the goals should be changed. So, for example, if UNSCEAR

disappeared, there should be some other organization to make the scientific basis. (Interviewee C)

However, the data suggest that there are instances of overlap, especially between the UNSCEAR and the ICRP, and that this overlap may cause tensions:

> There's always the potential for a bit of friction because, I mean, on paper, it should be that UNSCEAR reviews the science, ICRP takes the science and produces a system of protection. IAEA is very much about practical applications of that system. […] But of course, there are overlaps between them. And I just mentioned one particular one on radon where, you know, in my opinion the UNSCEAR has exceeded their brief slightly. They've come out with dose coefficients when really, it's ICRPs job. UNSCEAR should just review the science and then work in tandem with ICRP. But ICRP also, to be fair, steps on the toes of UNSCEAR because ICRP decides to do its own reviews of literatures as well. (Interviewee I)

In sum, the empirical findings suggest that the relationship between the UNSCEAR and the ICRP are more prone to tensions and potential conflicts, compared to the relationship involving the IAEA. To account for variation, this article studies the impact of organization type, size, and birthmarks—and the following sections discuss these variables in relation to the empirical findings.

Explaining variation

This paper suggests that organization type, size and birthmarks may influence cooperation and conflicts between organizations. Regarding organization type, this paper makes three propositions. First, the empirical findings support P1, and it is especially evident in the formal relations between the organizations. The data show that the ICRP more actively seek formal relations with other organizations as compared to the UNSCEAR and the IAEA. Moreover, the ICRP also welcomes active participation and not just observers. In relation to informal information sharing, the ICRP appear to prioritize the IAEA over the UNSCEAR. Consequently, information tends to flow more easily between the ICRP and the two other organizations, and IAEA in particular, than the other way around. This may help explain why there are less tensions between the ICRP and the IAEA, compared to the relationship between the ICRP and the UNSCEAR. Secondly, the data also support P2. The tensions related to resources is especially evident in the relationship between the UNSCEAR and the ICRP, and not in the relationship involving the IAEA. The data suggests that the UNSCEAR and the ICRP are highly dependent upon the same resources, especially their epistemic authority. Hence, they fail to offer distinct resources and the data imply that tensions arise because they need to protect their epistemic authority. Thirdly, P3 is also supported: there is some friction between the UNSCEAR and the ICRP because they are more prone to have overlapping roles and responsibilities. In

contrast, the relationship involving the IAEA has a much clearer division of labour between the three organizations.

Next, regarding the size of an organization, the data support P4 by showing how both the UNSCEAR and the ICRP, as small organizations, seek cooperation toward the IAEA. However, this pattern is more apparent in the ICRP compared to the UNSCEAR. Combined with organization type, the data thus suggest that the IAEA is indispensable both due to the resources it holds, especially its political authority, and also due to its size. Simultaneously, the ICRP has a double vulnerability related both to organization type and organization size, and combined, these traits prompt the ICRP to safeguard cooperation toward the IAEA. Moreover, interactions between the IAEA and both the UNSCEAR and the ICRP are more frequent—as compared to interactions between the UNSCEAR and the ICRP—and thus P5 is supported. Consequently, the data imply that the small secretariats of the UNSCEAR and the ICRP makes it more difficult for them to uphold continuous flows of information toward a wide range of actors, and they need to prioritize some organizations over others. The data also indicate that the UNSCEAR and the ICRP, to a greater degree than the IAEA, lean on informal interactions in order to compensate for the limitations due to the small secretariat:

> The secretariat is very small, but the ICRP members are everywhere, and that is a nice advantage of being a volunteer organization. So, the ICRP has these connections that are both official and unofficial, and they are very strong and very useful. (Interviewee A)

This, however, makes the UNSCEAR and the ICRP more vulnerable to changes in personnel, both in the staff and in the experts affiliated to the organizations.

Regarding organizational birthmarks, P6 is also supported by the empirical findings. Hence, the data suggest that birthmarks are vital in order to understand both the relationship involving the IAEA and the relationship and tensions between the UNSCEAR and the ICRP. Historically, the oldest of the three organizations is the ICRP, which was established in 1928. It was created to address the growing concerns about the effects of ionizing radiation being observed in the medical community. At its inception, the ICRP consisted of only a handful of people who met only one day every third year. Moreover, the ICRP did not have funds to cover travelling costs or payment to individuals doing administrative tasks. Consequently, the most important resource for the ICRP were their affiliated experts. The ICRP therefore carry two important birthmarks which influence its relationships with other organizations: first, it had a somewhat broad and nebulous mandate, not restricted to the development of recommendations, and second, the ICRP was a small NGO both regarding funding and staff. The UNSCEAR was established by the General Assembly of the United Nations in 1955 to be a scientific committee assessing and reporting the levels and effects of ionizing radiation. Initially, it had 15 member states

represented by senior scientists. It also had a small secretariat funded over the UN-budget. The IAEA was created in 1957 with the rather broad objective to accelerate and enlarge the contribution of atomic energy to peaceful purposes. From the beginning it was also a big IGO with 59 member states, and it had security regarding funding and staff. Moreover, the IAEA was fuelled by a certain degree of political authority. Considering the inter-organizational relationships between the UNSCEAR, the ICRP, and the IAEA today as compared to their inception, the data suggest that birthmarks related to resources, initial tasks, and key individuals, are particularly important in order to understand both the relationship involving the IAEA and the relationship between the UNSCEAR and the ICRP.

First, a lack of resources such as funding, staff, and political authority in the UNSCEAR and the ICRP, compared to the IAEA, influenced the relationship from the very beginning—and that these traits remain today. To illustrate, the first chairman of the ICRP, Rolf Sievert, felt the need to both secure cooperation toward bigger and better equipped organizations, as well as to eliminate the possible threat of other organizations, like the UNSCEAR, entering the domain of the ICRP:

> Sievert would later word his concern about ICRP's future in a letter: 'Frankly speaking, I always feel concerned when we speak of the world-wide recognition of ICRP […] If we continue on the present scale of our work, I am sure that we will soon lose our reputation […] Do you really think that ICRP with its limitation in specialists and means can take the responsibility of establishing [dose limits] affecting the entire atomic energy work? I am convinced that this will, within a few years, be impossible if we are not closely linked to a powerful safety organization working on a very broad basis.' So, Sievert was worried that, as a consequence of a lack of resources, ICRP would not be able to live up to the requirements that would be set by the Commission, and that other international partners would take over. In another letter he wrote: 'I worry very much about how our Commissions will be able to compete with an organization set up by the UN including many of the specialists in our Commissions and Committees and having the advantage of being able to get substantial support from the UN.' (Bo Lindell, in 'The Labours of Hercules')

An important aim for Sievert was thus to establish a formal relationship with the IAEA, which was in place in 1959. Moreover, he had concrete plans to expand the ICRP into a single international authority, also taking on the role of the UNSCEAR. However, he did not succeed in this effort and in 1958 the UN's General Assembly guaranteed the continued activity of the UNSCEAR. Secondly, from the beginning the ICRP needed to establish a scientific foundation for its work, simply because it did not exist at the time. Therefore, the

ICRP was not set up solely to make recommendation, and the initial role and responsibility of the ICRP was challenged when the UNSCEAR was created:

> It is important to remember that ICRP was like a grandfather when UNSCEAR was established decades after the creation of ICRP. From the beginning, ICRP needed to be an organization doing research and it worked with the scientific foundation. Now, it is often described as if the work and conclusions of the ICRP primarily is based on what the UNSCEAR is saying. It may be true to some degree; however, it is not the whole truth. And there are surely different opinions between different people regarding what is my role and what is yours. (Interviewee 7).

Consequently, the relationship between the IAEA and the ICRP in particular, was based on ICRPs perceived need to be affiliated with a bigger and more powerful organization. Furthermore, the same need seems to persist today, and thus the relationship involving the IAEA remains stable and relatively peaceful. However, the data points to potential conflicts related to resources and domains that were present in the relationship between the UNSCEAR and the ICRP from the beginning, but such possible conflicts did not surface:

> I received a letter from Francesco Sella, then Secretary of UNSCEAR. Francesco was a good friend and so I was rather surprised at the tone of his letter, in which he protested about ICRP entering a field that he felt was properly the purview of UNSCEAR. I don't remember exactly how we dealt with the matter, but it all passed off quietly, and we heard no more on the subject from Francesco. Indeed, from then on ICRP had excellent relations with UNSCEAR. (David Sowby in "Some recollections of UNSCEAR")

Today however, tension between the UNSCEAR and the ICRP seem to be more apparent, and the data indicate that it is linked to birthmarks and the role of key individuals. Scholars argue that relationships between organizations often are initiated, nurtured, and executed at the individual level (Koops, 2017: 201), and that key individuals, often leaders, impact flows of information, trust and conflict resolution between organizations (Faerman et.al., 2001; Reinalda & Kille, 2017: 228; Kille and Hendrickson, 2010; Kroeger, 2012; Schotter et.al., 2017; Zaheer et.al., 1998). In the initial stages of the relationships between the UNSCEAR and the ICRP, some of the most influential people in these organizations knew each other personally, and many had affiliations toward both organizations. The data thus suggest that this overlap was crucial for the inter-organizational cooperation which was developed:

> Indeed, what made UNSCEAR function and prosper from its earliest days were its people: their remarkable competence, friendliness, and willingness to work. […] It [the UNSCEAR] would go on to deepen and widen its work and, together with the professionally senior and already

greatly respected ICRP —indeed, often with the same people—would become and remain a small corner of world governance. (Ray Appleyard in "The birth of UNSCEAR – the midwife's tale")

Important examples of key individuals which facilitated cooperation between the UNSCEAR and the ICRP from the early years are Rolf Sievert, David Sowby, and Bo Lindell. Furthermore, the data suggests that, to a high degree, information sharing and trust between the UNSCEAR and the ICRP was built upon people with strong ties to both organizations—and that these people knew each other personally. A prominent example is the relationship between Bo Lindell and Daniel Beninson, and after Beninson's death, Lindell wrote:

> Dan was my best friend. The friendship began in 1956, when I was called to Rolf Sievert's office to meet a visitor from the secretariat of the new scientific committee of the United Nations, UNSCEAR. […] We found that we had the same views on radiation protection and the basic protection policy, and for that matter on almost everything. We cooperated to the extent that we were somewhat maliciously referred to as the 'Beninson– Lindell mafia.' During the forty-seven years of our friendship, we never once disagreed on any issue. We reached positions that made it possible for us to influence the international development of radiation protection and the view on radiation risks in ICRP and UNSCEAR. (Bo Lindell in "Tribute to Dan Beninson")

Furthermore, the data suggests that these organizations still are dependent upon such people, however, there are fewer people facilitating information sharing and trust now, compared to earlier:

> Human interaction is essential, and the number of people is not infinite. I know people who have been both the chairman of ICRP, a representative in the UNSCEAR, as well as a representative in the CSS. And this may be the reason why they have been so connected. […] So, these relationships are essential, and I'm actually very worried now because these connections are not as good as they used to be. After so many years in this line of work, I smell problems, and this is a potential problem, and with the radon it didn't work well. (Interviewee B)

And:
> Back in the days it was basically a handful of people. Now, the older generation is retiring and there are not many around who still remember, who have this historical memory, which is essential in my opinion. […] So, the overlap of people is decreasing, and it may impact the level of trust. (Interviewee 5)

Consequently, birthmarks linked to resources, tasks, responsibilities, as well as key individuals, are vital to understanding the two different inter-organizational relationships discussed in this paper. Cooperation between the UNSCEAR, the

ICRP and the IAEA appear to have been rather stable from the beginning, however the initial cooperation between the UNSCEAR and the ICRP has developed some tensions. To understand these tensions, the data suggest that cooperation originally was based on close relationships between key individuals, often affiliated with both the UNSCEAR and the ICRP. Furthermore, other potential conflicts between these two organizations, related to resources and domains, were held in check by these strong inter-personal relationships because they facilitated information sharing and trust. In recent years however, this has changed, and current tensions between the UNSCEAR and the ICRP have emerged in part because the organizations lack these strong inter-personal relationships which the cooperation was, and still is, dependent upon.

Conclusion

This paper asks what shapes cooperation and conflict between organizations at the global level, and why conflicts arise between organizations with a longstanding history of cooperation. The paper suggests that inter-organizational cooperation and conflict are based on flows of information, trust, resource dependencies and how responsibilities and roles are divided between organizations operating in the same issue area. Here, the data indicate that organization type, size, and birthmarks, are key to understanding patterns of cooperation and conflicts.

This research provides two main insights. First, both organization type and size are important to understand inter-organizational relationships. However, by combining these two characteristics a clear pattern emerges: Big IGOs, which hold political authority, are more autonomous and less vulnerable, compared to small NGOs. It is therefore less likely that conflicts will emerge between such organizations. because small NGOs actively will adapt to big IGOs in order to uphold cooperation and to remain relevant. However, tensions may develop more easily between small IGOs and small NGOs operating within the same issue area, especially when they depend on overlapping resources. Secondly, and more intriguingly, the data indicate that organizational birthmarks are vital to understand cooperation and conflict. Birthmarks provide a new and deeper understanding of why tensions are triggered in relationships with a longstanding history of cooperation. The data suggest that potential conflicts between organizations may be held in check as long as important functions related to the birthmarks remain relatively stable. However, when changes occur, the organizations fail to adapt due to the birthmarks they carry, and it may spark latent tensions or conflicts that have been there from the beginning.

Based on this study, three main avenues for future research are envisaged. First, most of the literature on inter-organizational relations emanate from business administration, and few entries refer to political organizations (Jönsson 2017: 61). There is thus a need to study inter-organizational relations between political organizations at the global level more deeply. Secondly, the past century has seen

a sheer growth in different types of IOs, and these IOs address an increasing range of global challenges. To understand the functioning of such organizations, scholars highlight the need to extend and reinvent the analytical toolbox. Future research should thus utilize organization theory in order to gain new insights and knowledge about IOs, and to further bridge the gap between IO studies and organization theory. Furthermore, IOs and other global actors are part of transnational spaces where activities span different levels. Hence, scholars need to study how different organizations, situated at different levels, work together to influence laws, regulations, and policy at both the regional and national level.

References

Ahrne, G. & Brunsson, N. (2005). Organizations and meta-organizations. *Scandinavian Journal of Management*, 21 (4), 429-449. https://doi.org/10.1016/j.scaman.2005.09.005.

Alexander, E. (1995). *How organizations act together: Interorganizational coordination in theory and practice.* Luxembourg: Gordon and Breach.

Bachmann, R., Knights, D., & Sydow, J. (2001). Trust and Control in Organizational Relations . *Organization Studies*, 22(2). https://doi.org/10.1177/0170840601222001

Barnett, M. N., & Finnemore, M. (2004). *Rules for the world: international organizations in global politics*. Cornell University Press.

Bauer, M. W. & Ege, J. (2016). Bureaucratic autonomy of international organizations' secretariats. *Journal of European Public Policy*, 23 (7), 1019-1037.

Boswell, C. (2017). The role of expert knowledge in international organizations. In A. Littoz-Monnet (Edt.). *The Politics of Expertise in International organizations.* New York. Routledge

Biermann, R. & Harsch, M. (2017). Resource Dependence Theory. In R. Biermann & J. Koops (Eds.) *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.

Biermann, R. & Koops, J. (2017). Studying Relations among international organizations in world politics: Core concepts and challenges. In R. Biermann & J. Koops (Eds.). *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.

Brugger, P., Hasenclever, A. & Kasten, L. (2017). Trust among international organizations. In R. Biermann & J. Koops (Eds.). *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.
Buchana Y, Garbutt M, & Seymour LF. (2018). Identifying Micro-Level Generative Mechanisms of ICT-Enabled Performance Improvement in Resource-Constrained Healthcare Organisations: A Critical Realist Perspective. E J Info Sys Dev Countries. e12057. https://doi.org/10.1002/isd2.12057

Charnovitz, S. (2011). Accountability of Public and Private International Organizations. In Reinalda, B. (edt.). The Ashgate research companion to non-state actors. Pp. 333-346. Ashgate.

Costa, A.C, Fulmer, C. & Anderson, N. (2018). Trust in work teams: An integrative review, multilevel model, and future directions. *Journal of Organizational Behavior*, 39(2), 169-184.

Cropper S., Ebers, M., Huxham, C., & Smith, PR. (2008). Introducing Inter-organizational Relations. In Cropper Steve, Ebers Mark, Huxham Chris, and Smith Ring (eds.) The Oxford Handbook of Inter-Organizational Relations. Oxford University Press. Oxford

Egeberg, M. & Trondal, J. (2018). *An organizational approach to public governance: Understanding and design.* Oxford: Oxford University Press.

Faerman, S., McCaffrey, D. & Van Slyke, D. (2001). Understanding Interorganizational Cooperation: Public-Private Collaboration in Regulating Financial Market Innovation. *Organization Science* 12(3), 372-388. https://doi.org/10.1287/ orsc.12.3.372.10099

Finnemore, M. (2014). Dynamics of Global Governance: Building on What We Know. *International Studies Quarterly, 58*(1), 221-224.

Franke, U. (2017). Inter-Organizational Relations: Five Theoretical Approaches. *Oxford Research Encyclopedia of International Studies.*

Fulmer, C. A. & Gelfand, M. J. (2012). At What Level (and in Whom) We Trust: Trust Across Multiple Organizational Levels. *Journal of Management*, 38(4), 1167–1230. https://doi.org/10.1177/0149206312439327

Gornitzka, Å. & Sverdrup, U. (2011). Access of Experts: Information and EU Decision-Making. *West European Politics.* 34 (1), 48–70.

Harrington, B. (2017). Studying elite professionals in Transnational settings. In L. Seabrooke & L.F. Henriksen (Eds.). *Professional networks in transnational governance.* Cambridge University Press. Cambridge.

Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource Dependence Theory: A Review. *Journal of Management, 35*(6), 1404–1427. https://doi.org/10.1177/0149206309343469

Jönsson, C. (2017). IR paradigms and inter-organizational theory: Situating the research program within the discipline. In R. Biermann & J. Koops (Eds.). *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.

Karns, M., Mingst, K., & Stiles, K. (2015). *International organizations: The politics and processes of global governance* (3rd ed.). Boulder, Col: Lynne Rienner.

Kille, K., & Hendrickson, R. (2010). Secretary-General Leadership Across the United Nations and NATO: Kofi Annan, Javier Solana, and Operation Allied Force. *Global Governance, 16*(4), 505-523.

Koops, J. (2017). Inter-Organizationalism in International Relations. A mulitilevel framework for analysis. In R. Biermann & J. Koops (Eds.). *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.

Krick, E., & Holst, C. (2020). The socio-political ties of expert bodies: How to reconcile the independence requirements of reliable expertise and the responsiveness requirement of democratic governance. In E. Krick & C. Holst (Eds.). *Experts and democratic legitimacy: Tracing the social ties of expert bodies in Europe*. New York, Routledge.

Kroeger, F. (2012). Trusting organizations: The institutionalization of trust in interorganizational relationships. Organization, 19(6), 743–763. https://doi.org/10.1177/1350508411420900

Laimer, C.G. (2015). Determinants of interorganizational relationships in science and technology parks: Theoretical and empirical evidence. *Gestão & Regionalidade,* 31(91). https://doi.org/10.13037/gr.vol31n91.2836

Legrand, T. (2019). Sovereignty renewed. Transgovernmental Policy networks and the global-local dilemma. In D. Stone & K. Moloney (Eds). *The Oxford handbook of global policy and transnational administration*. Oxford University Press.

Lipson, M. (2017). Organization Theory and Cooperation and Conflict among International Organizations. In R. Biermann & J. Koops (Eds.). *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.

Lægreid, P. (2020). Public administration research in Norway: An organisational and institutional approach to political organisations. In G. Bouckaert & W. Jann (Eds.), *European perspectives for public administration* (pp. 421-438). Leuven: Leuven University Press.

Marquis, C. & Tilcsik, A. (2013). Imprinting: Toward a Multilevel Theory. *Annals* **7**, 195–245. https://doi.org/10.5465/19416520.2013.766076

Mikecz, R. (2012). Interviewing Elites: Addressing Methodological Issues. *Qualitative Inquiry,* 18(6), 482–493. https://doi.org/10.1177/1077800412442818

Oliver, C. (1990). Determinants of Interorganizational Relationships: Integration and Future Directions. *The Academy of Management Review, 15*(2), 241-265.

Olsen, J.P. (2018a). The Bergen approach to public administration and political organization. *Norsk Statsvitenskapelig Tidsskrift*, *34*(4), 188–206.

Olsen, J.P. (2018b) Democratic accountability and the changing European political order. *European Law J*ournal, 24, 77– 98. https://doi.org/10.1111/eulj.12261

Paliszkiewicz, J. (2011). Inter-Organizational Trust: Conceptualization and Measurement. *International Journal of Performance Measurement* (1) 15-28.

Petintseva, O., Faria, R., & Eski, Y. (2019). *Interviewing Elites, Experts and the Powerful in Criminology.* Palgrave Macmillan. https://doi.org/10.1007/978-3-030-33000-2

Reinalda, B. & Kille, K. (2017). The evolvement of international secretariats, executive heads and leadership in inter-organizational relations. In In R. Biermann & J. Koops (Eds.). *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.

Ruggie, J. G. (1998). *Constructing the World Polity* (The new international relations series). London: Routledge.

Schneiker, A. (2017). NGO-NGO relations. In R. Biermann & J. Koops (Eds.). *Palgrave Handbook of Inter-Organizational Relations in World Politics.* Palgrave Macmillan.

Schotter, A.P. J, Mudambi, R., Doz, Y.L., & Gaur, A. (2017). Boundary Spanning in Global Organizations. *Journal of Management Studies*, 54(4), 403-421.

Scott, W. R. (2008). *Institutions and organizations: Ideas and interests* (3rd ed.). Los Angeles. Sage Publications.

Smith C and Elger T (2014) Critical Realism and Interviewing Subjects. In Edwards PK, O'Mahoney J and Vincent S (eds.) Studying Organizations Using Critical Realism. Oxford: Oxford University Press.

Steffek, J. (2013). Explaining cooperation between IGOs and NGOs – push factors, pull factors, and the policy cycle. *Review of International Studies, 39*(4), 993-1013. doi:10.1017/S0260210512000393

Stinchcombe, A. L. (1965). Social Structure and Organizations. In J. G. March (Edt.), *Handbook of Organizations* (142-193). Chicago: Rand McNally & Co.

Stone, D. & Ladi, S. (2015). Global Public Policy and Transnational Administration. *Public Administration*, 93(4), 839–855. https://doi.org/10.1111/padm.12207

Tallberg, J., Sommerer, T. & Squatrito, T. (2013). *The Opening Up of International Organizations: Transnational Access in Global Governance*. Cambridge: Cambridge University Press.

Van de Ven, A. (1976). On the Nature, Formation, and Maintenance of Relations among Organizations. *The Academy of Management Review, 1*(4), 24-36.

Weiss, T. G., & Wilkinson, R. (2018). From international organization to global governance. In T.G. Weiss & R. Wilkinson (Eds.) *International organization and global governance* (Second edition). Routledge.

Yang, TM. and Maxwell, T.A. (2011). Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors. *Government Information Quarterly,* 28(2), 164-175. https://doi.org/10.1016/j.giq.2010.06.008.

Zaheer, A, McEvily, B. & Perrone, V. (1998). Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance. *Organization Science*, 9(2):141-159. https://doi.org/10.1287/orsc.9.2.141

Zürn, M. (2017). From constitutional rule to loosely coupled spheres of liquid authority: A reflexive approach. *International Theory, 9*(2), 261-285. doi:10.1017/S1752971916000270

Appendices

Appendix A

Vil du delta i forskningsprosjektet
 "Governance in core state powers"?

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å forstå og forklare styremåter, styresett og handlingsmønster i atomenergisektoren. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål
Utgangspunktet for prosjektet vil være ulike teorier knyttet til statsvitenskap og offentlig politikk og administrasjon, og undersøkelsen vil ha fokus på ulike nivåer; både et nasjonalt og et internasjonalt perspektiv, samt samspillet mellom disse nivåene. Den aktuelle problemstillingen er: «I hvilken grad finner vi direkte, indirekte og nettverksbasert styring, på ulike nivåer, innen atomenergisektoren, og hva kan forklare dette?»

Formålet er altså å forsøke å forstå hvordan denne sektoren fungerer, og hvilke styringsmekanismer som dominerer. Prosjektet er videre en del av et PhD-prosjekt knyttet til Universitetet i Agder, og målet er dermed å ferdigstille dette prosjektet, inkludert å få publisert artikler i ulike fagfellevurderte tidsskrifter.

Hvorfor får du spørsmål om å delta?
Vi ønsker din deltakelse i denne undersøkelsen fordi du er ansatt i en organisasjon som er knyttet til atomenergisektoren, og prosjektet er interessert i din opplevelse av hvordan denne sektoren fungerer i praksis.

Hva innebærer det for deg å delta?
Denne undersøkelsen vil basere seg på dybdeintervjuer og du vil fungere som informant. Hvis du takker ja til å være med, vil du dermed bli intervjuet, enten over telefon, via Skype eller ansikt til ansikt, med utgangspunkt i intervjuguiden du mottar på forhånd. Intervjuene vil bli tatt opp som lydopptak, og de vil lagres elektronisk i et lukket og sikkert system knyttet til UiA. Vi antar at intervjuene vil vare i omtrent én time. Det er et mål å skaffe så mange informanter som mulig, i ulike organisasjoner, nasjonalt og internasjonalt, og på ulike nivåer innad de ulike organisasjonene.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Det er kun prosjektleder som vil ha tilgang til data som ikke er anonymisert underveis i prosjektet, og, som nevnt, vil alt lagres i sikre, passordbeskyttende systemer knyttet til UiA.
Det vil ikke være mulig å gjenkjenne prosjektets deltakere i publikasjoner.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?
Prosjektet skal etter planen avsluttes i februar 2021, og da vil alle personopplysninger slettes, og det er kun anonymisert materialet som lagres videre

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:
- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Universitetet i Agder har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:
- Prosjektansvarlig Kjerstin Kjøndal: kjerstin.kjondal@uia.no eller professor Jarle Trondal, som er veileder for prosjektet: jarle.trondal@uia.no
- NSD – Norsk senter for forskningsdata AS, på epost (personvernombudet@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Kjerstin L. Kjøndal
PhD-kandidat og prosjektansvarlig

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet «Governance in core state powers», og har fått anledning til å stille spørsmål. Jeg samtykker til:

☐ å delta i dybdeintervju

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet.

(Signert av prosjektdeltaker, dato)

Appendix B

Would you like to participate in the research project "Governance in Core State powers"?

This is an inquiry about participation in a research project with the working title "Governance in Core State Powers». In this letter we will give you information about the purpose of the project and what your participation will involve.

Purpose of the project
The project has a political science perspective on various actors, both nationally and internationally, which in different ways work on issues related to radiation protection, nuclear safety, security, and safeguards. We have named this sector "the nuclear safety sector" even though the span is broader than this title may imply. The main aim of the project is to increase knowledge about the sector and gain insight into the interactions between different actors.

The preliminary research question for the project is: "To what extent do we find direct, indirect and network-based governance, at different levels, within the nuclear safety sector, and how can we explain the findings?"

Hence, the purpose is both to understand how this sector functions and attempt to explain the findings. The project is a PhD-project related to the University of Agder in Norway, and a core part of the project is to publish articles in various peer-reviewed journals based on data collected through interviews.

Why would we like your participation?
We want your participation in this project because you are engaged in an organisation related to the nuclear safety sector.

What does participation involve for you?
The project will be based on in-depth interviews. Hence, if you are willing to participate, you will be interviewed face-to-face, or alternatively via Skype (or equivalent programs). The interviews will be recorded as audio recordings and they will be stored electronically in a closed and secure system related to the University of Agder. We assume that the interviews will last approximately 45-60 minutes. It is a goal to acquire a limited number of informants, in various organisations, nationally and internationally, and at different levels within the different organisations.

Participation is voluntary
Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

Your personal privacy – how we will store and use your personal data
We will only use the information about you for the purposes we have told you in this letter. We process the data confidentially and in accordance with the privacy policy of the NSD (The Norwegian Centre for Research Data). It is only the project leader who will have access to data that has not been anonymized during the project, and everything will be stored in safe, password-protected systems related to the University of Agder.

What will happen to your personal data at the end of the research project?
The Project is scheduled to end in 2021, in which case all personal data will be deleted, and only anonymized material is stored further.

Your rights
So long as you can be identified in the collected data, you have the right to:
- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?
We will process your personal data based on your consent.

Based on an agreement with the University of Agder, NSD – The Norwegian Centre for Research Data AS has assessed that the processing of personal data in this project is in accordance with data protection legislation. Project number at NSD: 61346

Where can I find out more?
If you have any questions about the study, or would like to use your rights, please contact:
- Project leader Kjerstin Kjøndal: kjerstin.kjondal@uia.no
- Professor Jarle Trondal, who is the supervisor of the project: jarle.trondal@uia.no
- NSD – The Norwegian Centre for Research Data AS, by email: (personverntjenester@nsd.no) or by telephone: +47 55 58 21 17.

Kind regards,

Kjerstin Kjøndal,

Phd-Candidate and Project Leader

Consent Form

I have received and understood information about the project "Governance in Core State Powers" and has had the opportunity to ask questions. I give consent:

☐ To participate in an in-depth interview

I give consent for my personal data to be processed until the end date of the project in 2021.

(Signed by project participant, date)

Intervjuguide til Statens Strålevern
Velkommen som informant i dette prosjektet som har fått arbeidstittelen
«Governance in core state powers». Tusen takk for at du er villig til å være med,
og at du setter av tid til dette! Generelt kan vi si at intervjuguiden kommer til å
tilpasses det enkelte intervju, og det betyr at ikke alt vil være like viktig i alle
intervjuer. Jeg tar opp intervjuet for å få nøyaktig informasjon, men planen er å
kun bruke data som er anonymisert, og i utgangspunktet skal det ikke være mulig
å gjenkjenne informanter i publikasjoner. Hvis jeg ønsker å sitere noe som ikke
lar seg anonymisere vil jeg aldri gjøre dette uten ditt forhåndssamtykke. Jeg vil
da ta kontakt med deg hvis det behovet oppstår. Ellers må du gjerne se hvordan
jeg bruker informasjon fra deg i analysen når et utkast foreligger, og jeg viser
også til mer informasjon om prosjektet i informasjonsskrivet du har mottatt.

Aktuelle spørsmål og temaer:
1. Innledning
- Samtykke til opptak
- Gjennomgang av informasjonsskriv
- Personopplysninger: navn, avdeling, nivå, stilling og utdannelse/faglig bakgrunn
- Spørsmål?

2. Oversikt over organisasjon, arbeidsområde og arbeidssituasjon
- Hvordan vil du beskrive Statens Strålevern – hvem og hva er viktig for
  organisasjonene som helhet, for din avdeling og for ditt personlige arbeid?
- Hva er dere opptatt av akkurat nå, og hvem setter agendaene for det arbeidet som
  gjøres?
- Hva er din avdeling sitt ansvar og arbeidsoppgaver?
- Egne oppgaver: Hva er dine arbeidsoppgaver, hva bruker du mest tid på generelt
  og hvordan er ditt arbeid organisert? Har du stor grad av frihet, jobber du mye
  alene eller i team? Hvordan organiseres i så fall teamarbeidet?
- Hva er du opptatt av akkurat nå – hva jobber du med og bruker tid på?
- Hva opplever du at organisasjonen som helhet er opptatt av og bruker tid på?
- Hvordan opplever du kontakten mellom ulike avdelinger og ulike profesjoner
  innad Strålevernet? Samarbeidslinjer og konfliktlinjer. Bruk gjerne konkrete
  eksempler.

3. Kontaktflate og informasjonsstrømmer
- Internt: Hvem har du mest kontakt med i det daglige? Her på
  avdelingen/seksjonen? I andre avdelinger? Hvordan er dette for
  avdelingen/seksjonen som helhet?
- Eksternt: Hvem har du mest kontakt med utenfor din organisasjon? Hvem har
  avdelingen/seksjonen mest kontakt med eksternt?
- Hvem vil du karakterisere som de viktigste kontaktene for deg, for din enhet og
  for organisasjonen som helhet: departementer/nasjonale myndigheter,

internasjonale aktører eller søsterbyråer i andre land som jobber med det samme som deg? (Helt konkret hvilke enheter det er snakk om) Andre sentrale aktører?

- Hvordan vil du beskrive kontakten med departementene (evt. Hvilke departement forholder du deg til)? Er signalene fra departementene/politisk ledelse viktig for deg i ditt daglige arbeid? Må departementer godkjenne det dere gjør? Har departementet faste personer dere forholder dere til, eller noen som regelmessig kommer til dere? Bruk gjerne konkrete eksempler for å beskrive hvordan dette fungerer i praksis.

- Hvem oppfatter du som de viktigste premissleverandørene for deres arbeid? Hvem tar du hensyn til i ditt daglige arbeid?

- Hvem spør du om råd, hvem lytter du til og hvem opplever du som viktige for at du skal gjøre en god jobb? Hvorfor akkurat disse?

- Hvilke nettsteder, tidsskrift eller annet er viktig for deg i din jobb?

- Opplever du stort sprik mellom dine arbeidsoppgaver, det du bruker tid på og hvilke kontakter som er viktige for deg, og på den andre siden; hva som er viktig for organisasjonen som helhet?

- Dere forholder dere til flere aktører; Hvordan opplever du det? Reiser det noen problemstillinger som er aktuelle for arbeidet ditt? Er det sprikende forventninger eller krav til dere? Bruk gjerne eksempler for å beskrive.

4. Internasjonalt arbeid

- Hvordan vil du generelt beskrive Strålevernets internasjonale arbeid? Viktig/ mindre viktig? Hvem deltar (både personer og organisasjoner)? Hyppighet?

- Deltakelse:
✓ Type aktivitet: Hva har du deltatt på av internasjonalt arbeid? (Om mye, avgrens til siste året). Hva er det i hovedsak du deltar på? (Policyutforming? Informasjonsutveksling? Beslutningstaking? Opplæringsaktiviteter? Iverksettingsatferd? Lovverk og standardsetting? Sertifisering? Fagkomiteer? Annet?)
✓ Omfang: Hvor mye av dette har du deltatt på? Hvor mye tid tar det? (Forberedelser, deltakelse, etterarbeid, evt. avspasering)
✓ Hvem andre deltar på disse aktivitetene? (Både fra egen organisasjon, og fra andre enheter)
✓ Hvem organiserer og tar initiativ til slike aktiviteter?
✓ Hvordan vil du beskrive kontakten med internasjonale aktører? Hvilke aktører er viktige? Hvilken vei går påvirkningen? Andre momenter du tenker på?
- Innhold:
✓ For hver aktivitet: Hva ble diskutert? Hva ble utfallet?
✓ Nytte: Hvor stort utbytte var det generelt, og for deg, av aktiviteten?
✓ Hvor viktig/nyttig er det å delta på slike aktiviteter?

5. Caser
- Faktisk case 1: Kjernekraftulykken i Fukushima (11.mars 2011).
✓ Kan du beskrive din opplevelse av det som skjedde da nyheten om ulykken nådde deg og din organisasjon? Hvor kom informasjonen fra? Hvem var det

viktig å kontakte/snakke med? Hvordan jobbet dere internt, og hva betydde eksterne aktører?
- ✓ Hvem mener du var de viktigste premissleverandørene for hvordan denne krisen skulle håndteres?
- • Faktisk case 2: Brann i russiske ubåter med kjernefysiskmateriale om bord (f.eks Tomsk i 2013)
- • Faktisk case 3: USA trekker seg fra Iran-avtalen
- • Tenkt case: En ulykke ved atomkraftverket på Kola
- • Andre «tenk-hvis»-scenarioer som kan være aktuelle?

6. Avslutning
- • Er det noe du føler du ikke har fått sagt som kan være nyttige opplysninger?
- • Har du noen spørsmål til mitt forskningsprosjekt? Hva jeg gjør eller er ute etter å finne?

Interview Guide
Welcome as an informant to the project "Agency Governance in Core State Powers" and thank you very much for your time and effort to participate. This guide will provide you with an overview over important themes and questions, and it will serve as a starting point for the conversation and a checklist during the interview.

Questions and themes:
1. Overview of the organization and your work
- Describe your work: what are the core tasks of your daily work? How do you distribute your time budget? What persons or units are important to you when doing your work? Who do you ask for advice? Where do you get inspiration and ideas that influences your work?
- To what degree are you able to influence your own workday or work schedule? How much autonomy do you enjoy in your daily work?
- How do you experience the relationships between different departments and various professions within your organization? What are the levels and patterns of collaboration and conflict? Feel free to use specific examples.
- If you were to describe your organizations as a whole, how would you describe the core aims of the organization, and how do you work to achieve those goals?

2. Important contacts and relationship to parent ministry
- External: Who are your most important contacts outside the organization? Persons, networks, organizations?
- Who would you characterize as most important to you in your daily work: Ministries and/or national governments, international actors (like IAEA or the EU), research communities/ networks, or sister agencies in other countries (like Norway or other Nordic countries)?
- How would you describe the contact with the ministries: which ministry do you relate to? Are the signals from ministries/political leadership in your home country important to you in your daily work? Must ministries approve what you are doing? Does the ministry have permanent persons you relate to, or someone who regularly comes to you? Frequency of interaction with the ministry. Feel free to use specific examples.

3. International work
- How would you generally describe the international work of your organization? Important/less important? Who participate (both people and organizations)? Frequency?
- Who are the important international actors in your perspective? Why?
- Participation:

- ✓ Type of activity: What have you attended internationally? (Courses, committees, conferences, other arenas?) Frequency and time spent on international work.
- ✓ What are you involved in internationally: Policy design? Information and knowledge exchange (best practices)? Decision making? Training activities? Implementation? Legislation? Making standards? Making statements? Certification? Professional committees? Other?
- ✓ Who else participates in these activities? (Both from own organization, and from other entities).
- ✓ Who organizes and takes the initiative to such activities?
- Content:
- ✓ For each activity: What was discussed? What was the outcome?
- ✓ Benefit: How beneficial was it in general, and for you?
- ✓ How important/useful is it to participate in such activities?
- Do you experience being coordinated in relation to the international work, or do you have some degree of autonomy? Describe. (Do you have a clear mandate, is it done under confidence, or on purely professional/academic grounds?)
- How would you describe your loyalty: to your own profession, to your organization, to your home country or to international actors?

4. Additional questions
- Who or which actors have the power and influence in this sector in your opinion?
- How do you go about implementing new laws, rules or procedures? Who decides what, how and when to implement something?
- Where do different organizations get their resources?

5. Summing up
- Can you think of anything important we have not discussed?
- Do you have any questions regarding the project?

Appendix E

Interview guide international level

- About the interviewee themselves: background and experience from international work. Experience from different organizations?

  <u>The organization/committee/task group (ICRP, IAEA and/or UNSCEAR)</u>
- How the organization function as a whole: funding, agenda setting, recruiting of members, permanent secretariat or not, how often people meet. Aim of the organization. Who does the organization cooperate with – formally and informally? Frequency and perceived importance of the cooperation.
- Does the organization have stable structures or is it more ad hoc? Like a secretariat, fixed schedules?
- Croups and committees: time spend, relationship toward own home country (mandates from national governments or organization you represent f.ex?) , agenda setting, frequency. The international arena as a secondary structure? Perceived importance of own organization (the international organization you participate in) and cooperation toward other actors.
- Are you mostly agreeing on how to work or are there lot of disagreement and discussion? Which topics are more or less difficult to agree on? Agreement over time, or are there always lots of discussion? What triggers discussions?
- To what degree are your work related to the political level? Are there areas where you need to be more careful and sensitive toward politics? Are some topics more politicised, compared to being at the more technical level?

  <u>Other actors and governance</u>
- Governance structures at the international level. Which organizations (or other actors) are important, and why?
- How much time do you spend on cooperation with, or engaging, other actors/organizations (as part of an international organization)?
- Overlap in personnel between different organizations?
- The distinction between **core state** and non-core issues. How does it play out at the international arena? Different actors or arenas?

NSD

Kjerstin Kjøndal
Serviceboks 422
4604 K RIST IAN SAN D S

Vår dato: 19.07.2018   Vår ref: 61346 / 3 / AMS
Deres dato: Deres ref:

Vurdering fra NSD Personvernombudet for forskning § 31

Personvernombudet for forskning viser til meldeskjema mottatt 28.06.2018 for
prosjektet:

61346   Governance in core state powers
Behandlingsansvarlig   Universitetet i Agder, ved institusjonens øverste leder
Daglig ansvarlig   Kjerstin Kjøndal

Vurdering
Etter gjennomgang av opplysningene i meldeskjemaet og øvrig dokumentasjon
finner vi at prosjektet er meldepliktig og at personopplysningene som blir samlet
inn i dette prosjektet er regulert av personopplysningsloven § 31. På den neste
siden er vår vurdering av prosjektopplegget slik det er meldt til oss. Du kan nå gå
i gang med å behandle personopplysninger.

Vilkår for vår anbefaling
Vår anbefaling forutsetter at du gjennomfører prosjektet i tråd med:
•opplysningene gitt i meldeskjemaet og øvrig dokumentasjon
•vår prosjektvurdering, se side 2
•eventuell korrespondanse med oss

Vi forutsetter at du ikke innhenter sensitive personopplysninger.

Meld fra hvis du gjør vesentlige endringer i prosjektet
Dersom prosjektet endrer seg, kan det være nødvendig å sende inn
endringsmelding. På våre nettsider finner du svar på hvilke endringer du må
melde, samt endringsskjema.

Opplysninger om prosjektet blir lagt ut på våre nettsider og i Meldingsarkivet

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

Vi har lagt ut opplysninger om prosjektet på nettsidene våre. Alle våre institusjoner har også tilgang til egne prosjekter i Meldingsarkivet.

Vi tar kontakt om status for behandling av personopplysninger ved prosjektslutt Ved prosjektslutt 28.02.2021 vil vi ta kontakt for å avklare status for behandlingen av personopplysninger.

Se våre nettsider eller ta kontakt dersom du har spørsmål. Vi ønsker lykke til med prosjektet!

Katrine Utaaker Segadal
                    Anne-Mette Somby

Kontaktperson: Anne-Mette Somby tlf: 55 58 24 10 / anne-mette.somby@nsd.no

Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Den 20. juli trer EUs personvernfordning, samt den nye norske personopplysningsloven, i kraft. Prosjektet ditt er imidlertid vurdert etter dagens personopplysningslov, ettersom prosjektet ble meldt inn før det nye regelverket begynner å gjelde. Etter dagens lovverk har ditt prosjekt behandlingsgrunnlag i samtykke, jf. personopplysningsloven § 8 første ledd, og er vurdert av personvernombudet med hjemmel i personopplysningsloven § 31. Vi har i tillegg vurdert at informasjonsskrivet og samtykkeskjemaet ditt fyller kravene til et informert samtykke også etter det nye regelverket. Det er derfor vår oppfatning at du vil ha gyldig behandlingsgrunnlag i utvalgets samtykke når det nye regelverket trer i kraft 20. juli, da i medhold av personvernforordningen artikkel 6 nr. 1, bokstav a.

Personvernombudet legger til grunn at forsker etterfølger Universitetet i Agder sine interne rutiner for datasikkerhet.

Forventet prosjektslutt er angitt til februar 2021 i informasjonsskrivet. Innsamlede opplysninger skal da anonymiseres.
Anonymisering innebærer å bearbeide datamaterialet slik at ingen enkeltpersoner kan gjenkjennes. Det gjøres ved å:
- slette direkte personopplysninger (som navn/koblingsnøkkel)
- slette/omskrive indirekte personopplysninger (identifiserende sammenstilling av bakgrunnsopplysninger somf.eks. bosted/arbeidssted, alder og kjønn)
- slette digitale lydopptak