Global Environmental Assessments and Bureaucratic Reputation Theory: Caught in the Limelight: How the IPCC Manages and Develops its Reputational Profile over Time

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Preface

This thesis marks the completion of my Master's programme in Public Administration: Public Management and Leadership. The choice of topic - the IPCC – is a science-policy advisory body to the global climate governance system. Bureaucratic reputation theory acts as the lens through which to explain its behaviour over time from a more strategic perspective, as opposed to traditional literature that frequently adopts a more historical approach on how it did behave, or a normative approach to recommend how it ought to behave.

This thesis is an extension of my Bachelor's thesis that analysed climate scepticism and the merit of distrust in climate science. It also synergizes well with my other Master's programme 'Governance of Sustainability'. On a more personal level, this choice of topic is motivated by a passion for the role of science in society, and the utilization of scientific knowledge in politics. How do we come to know and how do we know who to trust to tell us what is true? In today's global society, we inescapably rely on the testimony of (trustworthy) authoritative figures to both acquire knowledge and use it to change our future. The legitimacy of the politician, the bureaucrat and the scientist are inextricably intertwined because values, administration and information are as well. In an issue context where scientific knowledge is so politicized, the severity and urgency of the problem so daunting, and the epistemological nature so complex, understanding the role, influence and behaviour of advisory bodies is pivotal. Consequently, the elemental role of the IPCC in global climate governance and its one-of-a-kind scale of scientific collaboration merits the substantial literature on it. It was a delight to learn more about it, an honour to talk to the scientists working pro bono for it, and my ambition to contribute any novel insight.

I want to thank my friends and family for the motivation derived from their continued interest in this work, the interview participants for their willingness to be interviewed despite their busy schedules, for their pro bono contributions to the IPCC endeavour as well as their openness and honesty in their answers. Finally, I wish to thank my supervisor Dr. Johan Christensen for his insightful comments and support during this project.

Abstract:

Global environmental assessments assume an increasingly central role in international policymaking. Among them, the IPCC stands out as the authoritative voice of climate science. According to reputation theory, the maintenance of such a positive reputation requires the communication of organizational strengths to its audiences. The theory predicts patterns of emphasis and change over time, but has yet to be tested in this institutional setting. This thesis contributes to reputational theory through testing and extending its theoretical expectations to the case of the IPCC based on GEA literature. It quantitatively analyses the IPCC outputs and communication material over the course of 1994-2022, and qualitatively investigates the experience of IPCC leadership during that time. The results suggest that the IPCC becomes more reputationally aware over time, but does not diversify its legitimization strategies along hypothesized dimensions to the public - despite leadership commitment to those dimensions – but rather reinforces its technical image.

KEYWORDS: Global environmental assessment; IPCC; organizational reputation; bureaucratic reputation theory; reputation management; legitimacy

List of Abbreviations

AR	Assessment Report
BRT	Bureaucratic Reputation Theory
CRELE	Credibility, Relevance, and Legitimacy
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Service
IPCC	Intergovernmental Panel on Climate Change
GEA	Global Environmental Assessment
SBSTA	Subsidiary Body for Scientific and Technological Advice
SPM	Summary for Policymakers
UNFCCC	United Nation Framework Convention on Climate Change

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1. Introduction:

The role of scientific advice in governance and the boundary between science and politics has commanded mounting attention over the past decades. As technocratic advisory bodies fill a vacuum created by increasing multilateral cooperation, scholars have started to question the legitimacy of these advisory institutions (C. A. Miller, 2007). Others have remarked the tension between the increasing political demand for science justifying decision-making, and the inflationary use of science undercutting its previously assumed legitimacy (Weingart, 1999). These developments raise the important question of how international advisory bodies position themselves to bolster their credibility and legitimacy.

A prime example of an international advisory body, or a 'science-policy interface' is the Intergovernmental Panel on Climate Change (IPCC) (Ruffini, 2018). The IPCC was created in 1988 under the auspices of the World Meteorological Organization and United Nations Environment Programme in an attempt to create an authoritative centre of 'state-of-the-art' knowledge on climate change (Hulme & Mahony, 2010; Mahony, 2013; C. A. Miller, 2004; van der Sluijs et al., 2010; Wynne, 2010). It distinguishes itself from other advisory systems by conducting no research itself, but it instead periodically synthesizing existing expert literature. Its organization is relatively simple, administering three working groups on (i) the dynamics of the climate system, (ii) vulnerability and impacts, (iii) mitigation pathways, and one taskforce for the monitoring of greenhouse gas inventories.

The IPCC is continuously evaluated on whether it lives up to this task, and evaluations rely on more than pure conduct. Public perception is strongly mediated by the attempts of fossil fuel and free-market interests groups to delegitimize the IPCC (Jacques et al., 2008; Oreskes & Conway, 2010). IPCC must thus engage in image creation, proving to audiences that, despite what contrarians claim, it is expert and capable, and that it sticks to procedures and appropriate values. The IPCC is compelled to cultivate a positive reputation towards its audiences and thus subject to the study of reputation management. The IPCC poses an interesting case for studying reputation management because of the combination of its rather unique apolitical task specialization to provide 'policy relevant but not policy prescriptive' assessments, with strong political control over the final summary document that must undergo a line-by-line review by government delegations.

The waxing and waning of the IPCC's prestige as a scientific advisory body towards its many audiences has been extensively studied in sustainability and interpretive sciences. How the IPCC defends its scientific authority and manages its boundary with the political realm is described by scholars in those fields under the term 'boundary work' (Hoppe et al., 2013; Jasanoff, 1990; Mahony, 2013) and the dimensions of 'credibility, relevance, and legitimacy' (CRELE) act to measure its success as a science-policy interface (Mitchell et al., 2006). Though this body of research has yielded rich qualitative insights, some scholars question its utility. CRELE indicators carry prescriptive implications on how 'successful' science-policy interfaces operate that do not strictly match what policymakers value (Dunn & Laing, 2017). Furthermore, the concept of boundary organizations and CRELE indicators are limited as descriptive and explanatory tools. 'Boundary organization' is a broadly applicable descriptive label signalling that an organization strives for a better science-policy interplay, but not suited for explanatory analyses (Gustafsson & Lidskog, 2018). CRELE indicators are mutually constitutive, not conceptually distinct, and rarely systematically identify to which

audience they relate (Heink et al., 2015). Combined, these rather normative ideas of task and purpose crowd out strategic considerations.

Rather than taking a bottom-up perspective and picturing the IPCC as guided by scientific ideals of information uptake, one can adopt an organizational perspective: the IPCC as an independent government agency with political principals (the Panel) that select high-level bureaucrats (co-/vice-chairs) who follow a task mandate. In this view, it must weigh these scientific ideals with an eye for appeasing its audiences and to make it indispensable to political actors by performing a unique function that it enjoys a positive reputation in. This perspective of 'bureaucratic reputation theory' (BRT) shows striking similarities with the interpretive frameworks, echoed by reputational scholar Daniel Carpenter's claim that audiences vest authority in organizations when they are perceived to be '*legitimate, expert, and effective*' (Carpenter, 2014, p. 54). Yet BRT goes beyond that by postulating explanatory concepts guiding strategic behaviour. At the core of the theory, organizations are pushed within their task to carve out a niche and prove unique added value – to cultivate *reputational uniqueness*. Based on this uniqueness, they can be expected to emphasize different strengths, or different *dimensions* of reputation, such as their expert competences (technical), their adherence to relevant laws or procedures (legal-procedural), their performance (performative), or their normative ideals (moral). Consequently, organizations are expected to respond differently to *threats* to their *reputation* depending on whether it threatens their core image and competencies. BRT has explored and explained the behaviour of risk regulators of pharmaceutics (Carpenter, 2014), monetary policy (Maor & Sulitzeanu-Kenan, 2016; van der Veer, 2021) and EU agencies (Busuioc & Rimkutė, 2019; Rimkutė, 2018), yet international diplomacy and scientific assessments remain uncharted territory. The IPCC's institutional setting of international climate change risk assessment is akin to that of (EU) regulatory science (Ghaleigh, 2016; Jasanoff, 1990). Moreover, it is a prime example of a Global Environmental Assessment (GEA) that have become increasingly prominent in the global policymaking sphere (Jabbour & Flachsland, 2017). The IPCC thus poses the logical next step for the development of BRT to pursue further study of global policymaking and environmental assessments.

Research Goal

This thesis pursues three goals. The first and primary goal is to test the applicability of BRT in the specific case of the IPCC. If the IPCC adheres to patterns proposed by or based on BRT, this suggests that the IPCC ought to be viewed – at least to some degree – as an organization motivated by strategic reputational concerns rather than an organization purely existing to improve the interplay between science and policy. Relatedly, the second goal is to gain a description of the IPCC's reputational communication that renders it comparable to other organizations through the application of a standardized quantitative methodology. A specific point of interest is the comparison between the IPCC and EU advisory agencies, because these arguably form its closest institutional and functional cousins studied by BRT. Finally, the third research goal of this single-case study is to provide more explanatory insights regarding these patterns of reputational communication, illuminating *why* they do or do not hold and what is unique about them. Such insights add to our understanding and can inform further study of GEAs by reputational scholars.

Research Question

To attain these goals, this thesis asks the following research question:

"How does the presence of reputational signals along the four dimensions of reputation in the IPCC's communication change over time (1994-2022) and how can this behaviour be explained by bureaucratic reputation theory?"

This thesis aims to answer this question through a quantitative keyword analysis of IPCC documents, such as bureau meetings, public communications, and the Summary for Policymakers (SPMs) of assessment reports. It investigates the relative presence of keywords associated with each of the four dimensions of reputation as first set out by Carpenter (2014): technical, legal-procedural, performative and moral. It documents these trends over time, across document types and among working groups. Finally, semi-structured interviews with IPCC scientists in leadership positions add further detail to the interrelations between these reputational dimensions and add an explanatory account of the changes over time.

Scientific Relevance

This thesis aims to make two contributions to the literature. Firstly, it heeds the advice of Carpenter and Krause (2012, p.31) to examine the "persistence and variability" of Carpenter's (2014) four dimensions of reputation in a novel institutional context. One may anticipate similarities with advisory bodies within the EU regulatory state as studied by Busuioc and Rimkutė (2019), but the political context of international diplomacy differs. It lacks a centralized authority and convenes a global audience of an unparalleled number of participating governments with a highly divergent set of interests, values, and cultures of using scientific information (Betsill & Corell, 2008). The legitimizing role of science within diplomacy is arguably more contentious as every decision implies a surrender of sovereignty and a commitment to long-lasting agreements (Sovacool & Linnér, 2016), and extensive debates revolve around legal language (i.e., should versus shall) to avoid undesirable future obligations (Bodansky et al., 2017). Such a forum thus forms an interesting case study for scholars interested in reputation management, as audience expectations are more divergent and political oversight is more attentive.

Besides the political context, the organizational context of the IPCC and most GEAs like it is quite unique. The IPCC hardly conforms to classic hierarchical and vertically-structured bureaucracy with full-time paid employment. It features a strong horizontal architecture characterized by shared leadership and frequent collaboration. Furthermore, scientists contribute a substantial amount of time pro-bono and on top of their regular employment. Both leadership, as well as contributing authors are enlisted for one assessment cycle of 6-7 years, though many contribute in one form or another (chair, contributing author, editor or commentor) for two or more cycles. Compared to other organizations, motivations of esteem or duty play a greater role in the willingness to participate. Considering that every administrator within the IPCC is also a scientific expert on an aspect of climate change, the effects of epistemic communities and their shared identity as a scientist may be more pronounced. When personal esteem is tied up with the culture and organization one is working for in such a fashion, one can expect employees to more ardently defend the organizational reputation (Carpenter, 2014). A study of the reputational management of the

IPCC acts as a stepping stone for reputational theory to explore these new contexts where it is duty rather than salary that motivates workers.

Secondly, this thesis also aspires to add novel insights to conventional studies of the IPCC. The typical qualitative analysis of the IPCC (Beck & Mahony, 2018; Dudman & de Wit, 2021; Hulme & Mahony, 2010; Mahony, 2013; Sarkki et al., 2014, 2015) and the associated concepts of boundary organization and CRELE indicators inhibits a structured comparison with other bodies. Comparisons with its biodiversity counterpart IPBES do exist (Borie et al., 2021; Brooks et al., 2014), but scholarly work would be enriched if these comparative insights are cross-referenced with a quantitative framework studying the entire sample of GEAs and control for their administrative and organizational context. With the proliferation of GEAs over the past decades, the time is ripe to explore their organizational behaviour, and this exploratory case study will show whether it would be a fruitful exercise to do so from a reputational perspective.

Societal Relevance

The question raised by this thesis is of importance because it relates to one of the most vexing policy issues: climate change. Climate change has earned the title of "the greatest and widest-ranging market failure ever seen" (Stern, 2007, p. 11), the most pressing and complex externality to correct (Helbling, 2018), as well as that of "super-wicked problem" (Lazarus, 2008; Levin et al., 2012; Pollitt, 2015). Unabated climate change would significantly strain long-term economic growth, especially in developing countries (Kompas et al., 2018). Extreme weather events such as storms, floods and droughts increase in frequency and intensity. These events significantly damage infrastructure, straining insurance markets and requiring expensive capital investments. They trigger disruptions in the food and water supply, spoiling crop harvests and increasing famines. Sea-level rise endangers coastal areas and are expected to erode and inundate small island states. Finally, many processes affected by climate change, such as ocean acidification, melting ice-sheets and glaciers, increasing pressures on ecosystems and the slowing of ocean circulation are characterized by non-linear dynamics and tipping points that are dangerously uncontrollable once passed (Lenton et al., 2019; Steffen et al., 2018).

Scientific information forms a constitutional element of policy, and international advisory bodies have consequently become crucial to global politics (Barnett & Finnemore, 2019; Gupta et al., 2012; Weiland et al., 2013). That this relevance is especially pronounced in environmental policymaking (Berg & Lidskog, 2017; Sundqvist et al., 2015), is evidenced by the proliferation of GEAs over the past decades (Jabbour & Flachsland, 2017). Understanding what guides the actions of an organization that provides the "state of the art" assessment of climate change science is necessary to ensure that this assessment is best articulated, communicated and taken up in political debate. This is all the more important because the IPCC informs the United Nations Framework Convention on Climate Change (UNFCCC), the principal political venue for global cooperation and policy on climate change. Though science cannot be a decisive factor in these negotiations, the standing of the principal scientific advisory body within global cooperation arguably influences whether its knowledge is usable during negotiations, and thus whether it can help inform climate policy. Through studying reputation, we can learn not only what improves this knowledge uptake, but also when reputational considerations may obstruct knowledge uptake.

Next to the societal relevance embedded in credible information being able to advance a policy issue to the benefit of countries, the legitimacy of scientific advisory bodies is important with respect to public support for climate action. The credibility of the expert is an important influencer of the public belief in explanations underpinning climate change (Collins & Evans, 2002; Petersen, 2012). Whether citizens perceive the scientific community to be in agreement on climate change related topics is an important influencer of their support for climate policy and societal action (Ding et al., 2011; McCright et al., 2013). Though a significant share of the scientific community shares the conclusions of the IPCC (Bray, 2010; Verheggen et al., 2014), it matters whether the IPCC also manages to establish a reputation of a credible communicator of scientific consensus in the eyes of the public. Here too, a BRT perspective could not only help to understand what increases legitimacy in the eyes of the public, but also why the IPCC may not prioritize it as an audience.

Thesis Structure

The next sections of the thesis are structured as follows. Section 2 'Theoretical Framework' first introduces *The Concept of Reputation* and the basic tenets of *Bureaucratic Reputation Theory and Organizational Behaviour* and the explanatory concepts of reputational uniqueness and task specialization. It then follows with a description of the various dimensions of reputation. Theory on the task specialization of *Global Environmental Assessments and International Diplomacy* is then applied to theorize how audience expectations of preferred reputational dimensions may differ in the IPCC context. Based on the theoretical discussion, the section introduces several *Expectations* regarding patterns in IPCC communications. Section 3 'Research Design' describes the mixed-method research design. After justifying the Case Selection, it details the *Sources of Data and Time Frame*, specifically quantitative agency communication and qualitative participant interviews. It then discusses the *Operationalisation of Concepts* through the keyword dictionary and the interview strategy of the qualitative analysis. The section then describes the *Data Collection, Preparation, and Method of Analysis*, including the various statistical models to analyse the data (paired t-test, regression, ANOVA). It wraps up with a discussion of *Reliability and Limitations* with due discussion of the assumptions underlying the statistical model. The thesis then analyses the results of both analyses in Section 4 'Analysis'. The *Quantitative Analysis* is concerned with the relative presence of reputational signals in agency outputs, the frequency of and differences in that output, and the differentiation among working groups. The *Qualitative Findings* document the main findings from the interviews with IPCC leadership in terms of audiences and add its interpretive insights to the importance of reputational dimensions. Section 5 'Conclusion' answers the research question with a summary of the main findings and states the *Contribution to the Literature*. The thesis concludes with *Limitations of this Research* approach, and *Directions for Future Research*.

2.Theoretical Framework

This section develops the theoretical lens through which to analyse the IPCC. It first introduces the basic tenets of reputational theory, in particular the subjective nature of reputation, how it drives behaviour and its benefits over alternative frameworks. The second part delves deeper into the public realm. It mentions successful applications of the theory, how reputation is an asset guiding behaviour and the different reputational dimensions an agency may appeal to. These discussions explain why an agency is motivated to pursue a *unique* reputation, and how that causes differential responses to *reputational threats*. The thesis then applies this reputational framework to GEAs. It first introduces the framework of task specialization and how that impacts reputational focus. It then conceptualizes an idea of reputational uniqueness for GEAs by drawing on the historical context they were founded in and the institutional context they operate in. Finally, it delves deeper into three mechanisms characteristic of GEAs that push it to take up a legal-procedural, and avoid a moral dimension in their reputation management. These pertain to (i) political considerations emphasizing equal representation of interests, (ii) task specialization emphasizing assessment procedures, and (iii) tension between scientific objectivity and political relevance. This section ends with expectations of patterns in the presence of reputational dimensions in the IPCC's communication.

The Concept of Reputation

The value of reputation was acknowledged in business before appearing on the radar of public administration (Dowling, 1993). A positive reputation is known to increase the customer's willingness to buy a service, and inspire employees to work harder and more efficient (Stuebs & Sun, 2010; Yoon et al., 1993). There is a conceptual point in these findings that demonstrates what a reputational perspective brings to the table in public administration. They show that the subjective evaluation of an organization's role and performance have significance for the organization's external audiences and workforce independently from its actual conduct. "*Reputations are composed of symbolic beliefs about an organization – its capacities, intentions, history, [and] mission*" (Carpenter, 2014, p. 33). Reputations therefore matter for public organizations too because employees are motivated by these symbolic beliefs, and audiences, including political principals base their evaluation on them.

According to Carpenter (2014), there are two mechanisms that underpin the explanatory power of reputation. The first mechanism is rooted in the individual psychological drive for esteem and status. People aim for a positive self-concept and base that to varying degrees on the groups they are part of, including their employer. Reputational considerations are constantly in the background, because how the organization is evaluated reflects back on a more personal level. The second mechanism is more forceful and strategic. Similar to the customer and the business, reputation forms a shorthand for relevant audiences, notably the public and political principals, for evaluating performance of a public entity. Reputational literature stresses that an influential component of this evaluation is not merely success, but also "[a]ppearing to be successful in a successful way" (Busuioc & Lodge, 2017, p. 250). Agencies have to strategically engage in image creation and impression management in order to satisfy and shape the expectations of external audience in order to appear successful.

Reputations act as a means for individuals to reduce complexity and filter information. In reality, organizations are variegated collectives composed of a heterogenous workforce that is bound together by a pursuit of employment and esteem, but that is projected as a single uniform entity ("IPCC") that seeks to establish as a *perception* that it is capable of what its audiences demand from it (Carpenter, 2014; Carpenter & Krause, 2012). Agencies hardly every form a single uniform entity. Subunits of an agency follow their individual task specializations and professional cultures, and each unit may consequently differentiate their reputation from the rest (Carpenter, 2001; Carpenter & Krause, 2012). In any organization, sub-units follow different goals and perform different tasks. Constructing a consolidated identity from multiple organizational subunits with a diversity of views remains a difficult exercise (Busuioc & Lodge, 2017; Busuioc & Rimkutė, 2019; Carpenter & Krause, 2012).

In this light, reputational literature presents a befitting middle ground between rational choice institutionalists that would expect civil servants to act predominantly in line with their own material self-interest (Gilad et al., 2015), and Science and Technology Studies that overall presume that boundary organization and GEAs like the IPCC to predominantly aim for facilitating better knowledge uptake in the policy sphere (Kowarsch et al., 2017; Sarkki et al., 2014). Rather, it would assert that audiences have heterogenous and sometimes conflicting expectations of the IPCC's organization, functioning and performance; that the IPCC's reputation acts as a conduit for those audiences to evaluate their expectations; that the IPCC can be expected to be mindful of external subjective perceptions.

Bureaucratic Reputation Theory and Organizational Behaviour

Since Carpenter's (2001) seminal work, BRT has flourished and matured in the study of the public sphere. The theory has been successfully applied to understand the behaviour of pharmaceutical regulators (Carpenter, 2014; Maor, 2007), motivations behind strategies of blame attribution (Gilad et al., 2015) and strategic silence in banking regulators' communications (Maor et al., 2013), the responsiveness of output to media coverage in social policy (Maor & Sulitzeanu-Kenan, 2016), and multilevel agency cooperation (Busuioc, 2016). More recently, it has been extended to the EU regulatory sphere to explain variation in output and communication framing (Busuioc & Rimkutė, 2019; Rimkutė, 2018), as well as interdepartmental coordination (Blom-Hansen & Finke, 2020) and decision making on fiscal policy in the face of a heterogenous audience (van der Veer, 2021).

Reputation exists independently from real endowed competencies and responsibilities, and each relevant audience evaluates reputational strength differently. If evaluations are positive, reflecting for example legitimacy, competency or expertise, reputation becomes an asset granting more trust and means to achieve goals, while if negative, it becomes a liability that problematizes operations (Carpenter, 2014). On the one hand, organizations in the public sphere must thus continuously manage expectations, nurture their reputation, justify their existence and prove their added value to their audiences at risk of budget cuts, curtailing autonomy or outright termination (Askim et al., 2020). On the other hand, reputational literature is replete with examples of the gains of a positive reputation in terms of discretion, public support, resistance to criticism, and relative influence (Carpenter, 2014; Gilad, 2008, 2009; MacDonald, 2010; MacDonald & Franko, 2007; Maor, 2007, 2011; Maor et al., 2013; Maor & Sulitzeanu-Kenan, 2013; Nicholson-Crotty & Miller, 2012).

Implicit in the concept of reputation is its multidimensionality. Carpenter (2014) proposes four key dimensions of organizational reputation along which organizations . First, agencies

can rely on their *technical* character, which generally resonates with a multitude of audiences (Maor, 2007). This means emphasizing their knowledge, capacity and skills (Carpenter & Krause, 2012) to convince audiences that its members have the scientific expertise, professional credentials, and methodological competences to be seen as authoritative figures (Busuioc & Rimkutė, 2019; Carpenter, 2014). Second, organizations could stress their *performative* capacities in satisfying the demands of relevant audiences through the quality or quantity of their output and outcomes in an attempt to convince audiences it executes responsibilities competently and efficiently. A specific component of this dimension is the capability to intimidate those under its supervision (Carpenter, 2014). Third, organizations can signal their *moral* reputation by emphasizing how the moral implications of their conduct align with dominant moral values like compassion, flexibility and honesty (Carpenter & Krause, 2012) or acting as a 'guardian of the public good' (Rimkutė, 2018). More generally, it captures whether the organization protects its constituencies' interest and the normative underpinning of its mission (Carpenter, 2014). Finally, organizations may focus on the *legal-procedural* dimension of reputation that relates to the perceived appropriateness and fairness of its means (i.e., rules, procedures, codes of conduct etc.) by which it achieves its mission (Carpenter, 2014).

At the core of establishing reputation and proving added value is 'reputational uniqueness', or the niche it carves out for itself based on its assigned mandate (Busuioc & Lodge, 2017; Carpenter, 2001; Maor & Sulitzeanu-Kenan, 2016). For political supervisors, there is no point in funding multiple agencies doing the same thing. Because reputation is a valuable asset and it hinges on uniqueness, an agency is motivated to continuously differentiate itself from functional look-a-likes. This makes the maximization of all four dimensions an unproductive exercise. Rather, agencies carefully tailor the mix of reputational signals in outward communication to reflect the strengths necessary to convince audiences of their competence in their unique reputation (Rimkutė, 2019). Moreover, they can adapt their reputation-promoting behaviour depending on the audience they are communicating with, or the outlet they are using (*ibid*). In short, agencies are continuously engaged in the persuasive task of convincing relevant audiences they possess the ideal mix of competencies and qualities to perform what is expected by that audience.

In contrast to active reputation promotion, agencies are conscious of what may harm their reputation. In the case of such *reputational threats*, agencies carefully calibrate the blame-attribution behaviour to minimize the negative impact (Gilad, 2009; Gilad et al., 2015; Maor et al., 2013b; Rimkutė, 2018). Depending on whether it would threaten their unique reputation, agencies selectively respond to complaints and threats (Gilad, 2009; Gilad et al., 2015; Maor et al., 2013; Rimkutė, 2018). In a similar vein, agencies treat certain decisions as irreversible because admitting mistakes can damage their reputation as well, and may be wary of new decisions affecting their reputation for the same reason (Carpenter, 2014). Agencies cherish their reputation and acknowledge its subjectivity and corresponding fragility.

The specific pattern reputation-boosting communications take depends on the task GEAs specialize in. Busuioc and Rimkutė (2019) verified that the reputational focus of an agency is in part determined by the nature of their regulatory task specialization and the expectations that accompanies. Advisory agencies deal in and are dependent on scientific information and their technical expertise to prove their relevance. Enforcement agencies ought to be aggressive and assertive in dealing with transgressions by supervised actors and are therefore more likely to rely on a performative reputation. Decision-making agencies need to follow due procedure in their application of rules and specialize in a legal-procedural reputation. IPCC assessments belong to the category of Global Environmental Assessments (GEAs) - "largescale, highly deliberative processes where experts are convened to distill, synthesize, interpret and organize existing scientific knowledge […] to inform decision-making" (Jabbour & Flachsland, 2017, p. 193). The parallel between advisory agencies and a GEA is rather evident: they rely on their expertise to inform decision makers. What draws attention and distinguishes GEAs is the processual character of the definition. Because GEAs conventionally do not conduct original research, the focus of their unique reputation is the *process* through which all available literature forms a coherent and relevant story policymakers.

To flesh out the unique reputation that agencies pursue, one must look at their *raison d'être* and the institutional context they are founded in (Carpenter, 2010; Carpenter & Krause, 2012). GEAs were introduced in a time of increasing environmental multilateralism, when the need for global cooperation became apparent yet few institutional structures were in place and a thorough understanding of the associated problems was lacking (Jabbour & Flachsland, 2017). Effective negotiations on how to address a problem require an agreement on a basic set of facts and characterization of the problem. GEAs came into being for this purpose: to organize the pre-existing knowledge and provide a consensual narrative on the problem framing that all parties subscribed to (Farrell et al., 2001; Mitchell et al., 2006). In its essence, synthesizing assessments contract the knowledge supply into one coherent and consensual evidence base that limits the possibility of further politicization of science down the line of policymaking (Weingart, 1999). Through the sheer number of scientific evidence and experts involved, GEAs generate scientific credibility in the form of a technical reputation, and through an elaborate process of synthesis and consensus-driven dialogue with delegates, it generates political credibility that takes shape in adherence to procedures.

The influence of a politically legitimated evidence base on political negotiations should not be underestimated. International negotiation fora lack a centralized authority and are inhabited by states with highly divergent and frequently conflicting interests, especially when it comes to the environment (Betsill & Corell, 2008; Ruffini, 2018). Such an anarchic environment paves the way for science to be used as a legitimisation device in supporting competing political objectives (Demeritt, 2001; Sovacool & Linnér, 2016). Without a commonly agreed-upon epistemic authority, the ability for each party to cite their own research encourages politicization of scientific evidence. This obstructs further negotiation, because one cannot negotiate over goals and duties without agreeing on facts. A reputable GEA can not only amend this but it can exert a powerful independent force in framing the problem and solution, which carries political implications (Carpenter, 2014; Jasanoff, 1990; Stone, 2012). Especially in the early phases of policymaking, authoritative scientific advice can induce uncontrolled issue development (Clark et al., 2002), which is unfavourable for parties wishing

to stall. In the worst-case scenario for some parties, an agreement on facts can undermine the negotiation space (C. A. Miller, 2007) and prevent stalling tactics (Eckley, 2002). The effect of consensus and framing favour some countries more than others, resulting in divergent preferences for the outcome, and thereby divergent audience expectations

The procedural character of GEAs and the reputational considerations that flow from it originate from an element of political oversight and of task specialization. In the light of the possible influence of GEAs on negotiation positions and the implicit requirement to approve of the consensus, governments demand more involvement. This involvement expresses itself in a higher degree of co-production of the assessment that then generates a sense of co-ownership (Mitchell et al., 2006). For example, the IPCC SPMs that represent the main findings of the underlying working group reports are subject to a line-by-line review process where a consensus among delegations and IPCC scientists must be reached on the framing of each sentence (on the condition of consistency with the underlying report written by scientists themselves).

An uncharitable interpretation of this involvement would dismiss it as political interference with science. A more realistic perspective is that shared political oversight over assessment procedures and content serves an important legitimizing function by ensuring a balanced coverage of national interests (Andresen & Hey, 2005; Andresen & Skjærseth, 2008). An assessment without political oversight is not one without political power dynamics because scientific expertise and resources for research are not equally distributed across countries (Andresen & Skjærseth, 2008; Gupta et al., 2012). Therefore, assessments have the power to bias debate in terms of directing issue focus to the interests of the more resourceful. These discrepancies in representation in the body of scientific work the GEA covers foster a lack of legitimacy and trust to those underrepresented in the debate without some degree of involvement and supervision (Biermann, 2006; Siebenhüner, 2003; Tushman & Scanlan, 1981). In other words, implicit in the political expectations of GEAs is to cover the interests of all parties equally, and not give disproportionate focus on some issues as a result of unequally distributed resources for research. For example, a small island state like Kiribati prioritizes environmental issues such as ocean acidification because of its proximity to corals, and climate change adaptation because of its risk of future inundation, but lacks the resources to fund research to the same degree as a country like the Netherlands can for nitrogen emissions and climate change mitigation. An important quality to prove to political principals is that processes guarantee equal representation of interest, and GEAs are consequently incentivized to cultivate a reputation for following due procedure as dictated by delegations.

The second and somewhat related procedural element of the GEAs concerns its task specialization. GEAs aim not simply to produce a relevant report, but typically endeavour to assess *all* available knowledge on an environmental topic. Striking a balance between exhaustiveness and relevance forms an inherent challenge for GEAs because not all information is equally relevant. This poses a dilemma with the accusation of failing in one aspect being more damaging to reputation than the other. One can draw a parallel with banking regulators (Gilad et al., 2015; Maor & Sulitzeanu-Kenan, 2016), where accusations of under-regulation are more threatening to their key (performative) reputation than overregulation. Under-regulation is interpretable as a leniency towards industry that conflicts with the popular ethos of regulators to protect consumers interest. Overregulation, on the other hand, can be framed as overzealously protecting consumer interest, which can even be lauded. For GEAs, accusations of omission are putatively more damaging because they lend themselves to interpretations of a biased representation, whereas an exhaustive

report at the cost of relevance is more in line with a scientific ethos of completeness and detachment. A reputational perspective not only lays bare the tension between imperatives, but also point to which side a GEAs may preferably err for the sake of its reputation. Finally, it points to the reputational facet that is best fortified to buffer against the more dangerous threat, as a strong legal-procedural dimension buffers against allegations of omission.

The unique function of consensus forming and facilitating political dialogue has implications for the degree to which a GEA can position itself as a morally astute organization. The boundary between science and politics, between facts and values, is more firmly established than for other advisory bodies. GEAs predominantly exist to parse out the main facts in a way that government delegations can use to negotiate. Two assessment contributors describe the relationship between scientists and politicians as between 'mapmakers and navigators' (Edenhofer & Minx, 2014). The comparison is illustrative of the internalized idea that GEAs ought not to be policy prescriptive, but masks the reputational challenge of balancing that with policy relevance. More direct relationship between scientists and decisionmakers tend to make them more relevant, legitimate and credible in the eyes of the latter (Jabbour & Flachsland, 2017), but by catering to the needs of political supervisors and collaborating more intimately, the agency opens itself up to accusations of being a 'stealth issue advocate' and importing values in what many understand as an objective and descriptive enterprise (Jasanoff, 1990; Pielke, 2007; Shaw, 2005). The reputational threat looms in the allegation of political advocacy that GEAs are sensitive to by relying on both a strongly unpoliticised character of scientific advice, as well as close collaboration with the political sphere to increase relevance. To stress normative ideals such as "a guardian of the public interest" can only fan allegations of politicized science, issue advocacy and prescription. Maintaining an image of separation between science and politics, between a technical and moral impression, is even more challenging for GEAs where consensus is less valued. With the age of GEAs comes a political demand for a shift in their orientation away from a consensual problem narrative to solutions (Jabbour & Flachsland, 2017). As the political realm demands more solution options, normative viewpoints must be integrated in GEAs, increasing the chance of politicization (Kowarsch et al., 2017).

This subsection reveals how the establishment of GEAs followed the emergence of international collaboration on environmental issues. In these contexts, they were unique in their ability to provide a consensual scientific narrative that facilitates negotiation and cooperation (Clark et al., 2006). Though their unique value hinges on their technical expertise (i.e., through the robustness of the evidence, the accuracy of models and the credentials of scientists), it is the procedural and relational aspects that play a crucial role in managing a legitimate image (Gluckman et al., 2021; Kowarsch et al., 2016, 2017; Mitchell et al., 2006). The real reputational juggling act is to frame itself as a highly technical organization while also being relevant, and to be relevant without coming across as politicized or normatively motivated. GEAs assess, synthesize and frame debates, and maintaining a reputation that it executes these processes to the satisfaction of its public and political audiences is inherently more challenging in this institutional context due to inherent tensions between scientific objectivity and political relevance and legitimacy.

Expectations

This sections build on the previously discussed literature of traditional reputational theory as well as its extension into international diplomacy and GEAs to formulate expectations to be tested in the analysis. The first expectation is explored qualitatively and estimates how the IPCC responds to the Panel audience. All other expectations relate to the presence of reputational dimensions in outputs. The principal factor hypothesized to explain these patters is its task specialization as a GEA. Table 1 summarizes the expectations.

i. Audiences

Limited resources compel agencies to prioritize the expectations of the most relevant audience members and most dangerous reputational threats. In a study of the European Commission, van der Veer (2021) observes that the fiscal supervisor is most responsive to the interest of those with the highest capacity to mobilize resources against it. In the case of the IPCC, the main arena for favouring the interest of one delegation over another is the negotiation of the SPMs. To define 'mobilization capacity', the intuitive option is funding. The IPCC is funded based on voluntarily donations, almost exclusively by Western industrialized countries, and for approximately half by the United States (IPCC, 2017). In the case of GEAs, however, power dynamics arguably transcend funding. Power is distributed equally because the consensual decision-making bestows a veto power on all government parties (Jabbour & Flachsland, 2017). In that case, the party who benefits least from issue development would be most likely to disrupt the consensus process, pose the largest threat to the functioning of the IPCC, and receive most attention from the IPCC during negotiations of the SPM. This would apply to those countries with a vested interest in fossil fuels, such as the USA, Australia, Gulf states and to a lesser degree India and China. This leads to the following expectation:

Ex. 1: The IPCC is most responsive in signalling reputation to audience members with a vested interest in fossil fuels.

ii. Technical Reputation

The IPCC was founded to as an authoritative source for climate change knowledge (Hulme & Mahony, 2010; Mahony, 2013; C. A. Miller, 2004; van der Sluijs et al., 2010). Like any GEA, the IPCC performs an advisory role, "regulating through information" (Ghaleigh, 2016), though its mandate is restricted as it does not conduct original research, nor can provide recommendations. BRT would generally predict that advisory bodies tend to stress their technical reputation over all others and consistently over time (Busuioc & Rimkutė, 2019; Rimkutė, 2018). This is because they derive their added value from a credible and comprehensive scientific assessment that tells a consensual narrative of the policy issue. The IPCC Panel composed of government representatives expects an assessment of supreme scientific quality, and the IPCC communications can therefore be expected to make frequent reference to its technical competences and expertise, irrespective of its age.

Ex. 2: The IPCC puts more emphasis on the technical dimension of reputation in its communication documents, and this primacy is not expected to change over time

iii. Legal-Procedural Dimension

Relying on one legitimization strategy may prove difficult to sustain for any organization (Busuioc & Rimkutė, 2019; Carpenter & Krause, 2012). An agency relying on one reputational facet to legitimize its existence is exceptionally vulnerable to scrutiny following a threat such as a scandal or underperformance. In order to preserve a more robust image, an agency can be expected to cultivate additional strengths along other reputational dimensions. Taking a life-cycle perspective, one expects agencies to expand their reputational repertoire over time (Busuioc & Rimkutė, 2019). In the case of the IPCC, one may suspect the legal-procedural dimension to be the second most emphasized reputational dimension for a number of reasons. Firstly, an important benefit of GEAs resides in its relational character. It is the iterative report drafting process in GEAs between scientists and delegates that fosters confidence of fair representation of interests in the reports (Clark et al., 2006; Kowarsch et al., 2016). Augmenting this strength in an attempt to benefit the panel audience is more likely to manifest in a better image along a legal-procedural dimension than any other reputational dimension. Secondly, one can hypothesize a demand for participation and representation by panel members based on their representation in the academic literature and their overall research capacity. Co-ownership of the GEA is an important factor in providing its legitimacy and contingent on co-production of the assessment (Mitchell et al., 2006). Hence, countries on the lower end of available research funding and capacity may demand procedural amendment to ensure representation of national issues and interests in the report. Thirdly, the specific type of advisory role that GEAs fulfil lends itself to a cultivation of the legal-procedural dimension over others. The vocabulary occurring in discussion of GEAs includes *collecting, synthesizing, assessment,* and *reviewing*. These principal responsibilities are laden with procedural connotations. Though expertise matters, GEAs are remarkable in their focus on *how* assessments are produced. For these reasons, one can expect to detect in the quantitative analysis as well as in the interview that:

Ex. 3: After the technical dimension, the IPCC puts most emphasis on the legal-procedural dimension in its communication, and this increases in relative prominence over time

iv. Performative Dimension

To establish a reputation for performance, an agency must convince it audiences that it reaches its objectives effectively and efficiently (Carpenter, 2014, p. 64). Agencies can cultivate such a reputation by acting assertively, intimidating the audiences they supervise or compel compliance other ways. This type of behaviour and associated reputation-building communication strategies is common in EU agencies because they legitimize themselves through the quality of their output, though this effect is smallest in advisory bodies (Busuioc & Rimkutė, 2019; Rimkutė, 2019). GEAs certainly carry a performative component of delivering assessments and consensus. In contrast to EU bodies, GEAs lack this focus on output legitimacy. In fact, the focus of GEAs is throughput, or *procedural* legitimacy based on the co-production of assessments with delegations, and the tasks specialization of assessment. By its advisory nature with a process-focus, there is little theoretical reason to expect that the IPCC emphasizes its performative dimension more than its technical or legal-procedural dimension, nor that it increases over time.

Ex. 4: After the technical and legal-procedural dimension, the IPCC puts most emphasis on the performative dimension in its communication, and remains constant over time.

v. Moral Dimension

For an audience to assess the moral and ethical character of an agency is to ask whether the agency has worthwhile goals, makes appeals to commonly shared principles, takes the protection of audience interests to heart, signals compassion for those affected by its decisions, and is flexible to audience demands (Carpenter, 2014). As with the EU agencies studied by Busuioc & Rimkutė (2019), this dimension appears at odds with the *raison d'être* of GEAs. GEAs are meant to provide a depoliticized consensual evidence base for negotiations with a clear boundary between science and values, between the mapmaking and navigation. Moral appeals to audiences would contradict this separation and thereby undermine the legitimacy of the produced assessments. One could therefore expect:

Ex. 5: The IPCC emphasises least the moral dimension of reputation in its communication, and this does not increase over time

However, organizations tend to become more reputationally astute over time and diversify their reputational appeals (Busuioc & Rimkutė, 2019). A compelling reason why an agency like the IPCC *would* cultivate a moral reputation is the politicized nature of the climate change debate. In a climate of public distrust, stressing technical competencies, due procedure or good performance may fall on deaf ears if the intentions of the agency are de facto distrusted. These dimensions may not sway a distrustful public which has repercussions for the legitimizing role of science in the political sphere, and a share of the IPCC's relevance to government audiences thus depends on the public trusting the science (Beck, 2012; Hulme & Mahony, 2010). Emphasizing good intentions, sound goals and shared values could enhance public trust and accord a reputation as a 'guardian of the public good' (Rimkutė, 2018). Such a guardian role presents a possible niche for the IPCC, especially when one considers the danger of climate change and the urgency of action. Another reason why GEAs become signal messages in moral terms is because GEAs are expected to transition towards more solution-oriented advice over time, because audience expectations evolve in accordance with the policy problem from problem assessment to solution options (Jabbour & Flachsland, 2017). This requires the integration and discussion of normative viewpoints (Castree et al., 2020; Kowarsch et al., 2017). At the same time, it is a precarious niche because it would open up the possibility of threats to its technical character. It is worthwhile to explore which of these rationales carries more weight in the eyes of IPCC leadership. One could formulate the contradictory expectation as:

Ex. 6: the IPCC emphasises least the moral dimension of reputation in its communication, but its relative importance increases over time

vi. Internal Differentiation

Though agencies are colloquially referred to as a single name "IPCC", internal subunits are subject to different expectations, task specializations, and unique reputations, causing them to emphasize different reputational dimensions in their communication (Carpenter, 2014; Carpenter & Krause, 2012). The IPCC is famously divided into three working groups, each with its specific specialization, mandate and epistemic community. The SPMs of each working group are negotiated with the political Panel separately, before they are further condensed in a Synthesis report. Because the synthesis represents a summary of the WG reports, it represents a benchmark against which to analyse the relative reputational emphasis of the other reports. Working group I assesses the physical scientific basis of the climate system

and climate change. This is predominantly a descriptive exercise, where one may expect the satisfaction of the audience to hinge on the quality of evidence, methods and resulting content over procedure, performance or societal implications.

Ex. 7: The technical dimension shows a higher presence in the Summary for Policymakers of Working Group I than in the Synthesis report

WGII investigates the vulnerability of societies and natural systems, the impacts of climate change on those systems, and adaptation solutions. This working group is fundamentally concerned with the implications of climate change on society, and could formulate a stronger 'guardian of the public interest' position as other risk regulators do (Rimkutė, 2019). Accordingly:

Ex. 8: The moral dimension shows a higher presence in the Summary for Policymakers of Working Group II than in the Synthesis report

Working group III focusses on mitigation pathways and responses for GHG reductions. It informs countries on how they ought to act to reach a certain goal. For this WG, one could expect a more explicit focus on a performative dimension as the implications of its research correspond directly to action desired from political audiences.

Ex. 9: The performative dimension shows a higher presence in the Summary for Policymakers of Working Group III than in the Synthesis report

Table 1: Expectations of Reputational Trends

No.	Expectation
1	*The IPCC is most responsive in signalling reputation to audience members with a vested interest in fossil fuels.*
2	*The IPCC puts more emphasis on the technical dimension of reputation in its communication documents, and this primacy is not expected to change over time*
3	*After the technical dimension, the IPCC puts most emphasis on the legal-procedural dimension in its communication, and this increases in relative prominence over time*
4	*After the technical and legal-procedural dimension, the IPCC puts most emphasis on the performative dimension in its communication, and remains constant over time.*
5	*The IPCC emphasises least the moral dimension of reputation in its communication, and this does not increase over time*
6	*The IPCC emphasises least the moral dimension of reputation in its communication, but its relative importance increases over time*
7	*The technical dimension shows a higher presence in the Summary for Policymakers of Working Group I than in the Synthesis report*
8	*The moral dimension shows a higher presence in the Summary for Policymakers of Working Group II than in the Synthesis report*
9	*The performative dimension shows a higher presence in the Summary for Policymakers of Working Group III than in the Synthesis report*

3. Research Design

This section describes and justifies the chosen methodology to answer the research question. After outlining the type of research approach, it justifies the case selection, the time-frame and elaborates on the sources of data. Afterwards, it provides details on the method of analysis and finishes with an addressal of the reliability and validity of the chosen approach.

The overarching goal of this research is to apply and extend theory of reputational literature to GEAs and international diplomacy and render studies of the IPCC comparable to that of other institutions. To do so, expectations build on the reputational concepts of task specialization and unique reputation of the IPCC as a specialized GEA. Based on these characteristics, it conjectures expectations regarding the reputational focus in the communication of the IPCC along the four reputational dimensions. The design is X-Y focused, with the independent variable (*'Task Specialization'*) explaining patters in the various outcome variables *('Technical Reputation', 'Legal-Procedural Reputation', 'Performative Reputation, 'Moral Reputation'*). This is a deductive exercise, testing whether theoretical predictions proven by among others Carpenter (2014), Busuioc and Rimkutė (2019), and van der Veer (2021) obtain for the IPCC. These propositions lend themselves for a quantitative keyword analysis examining the presence of reputational framing in IPCC outputs. The same method is applied to study internal task differentiation within the IPCC working groups. To supplement these findings and add further understanding to the patterns, this thesis makes use of semi-structured qualitative interviews. This is an interpretive and exploratory exercise, qualitatively examining the perspectives of IPCC leadership officials.

Single-case in-depth case studies are of considerable value not by delivering broadly generalisable findings, but by providing interpretive accounts of the explanatory mechanisms. Hence, it is not only academically relevant to test if theoretical propositions hold for this specific task specialization and institutional setting, but to also understand how they matter and how BRT concepts ought to be understood in this new context. This poses a more exploratory qualitative endeavour in which interview participants are asked how they understand these facets of reputation to matter, how they relate to each other, and how they relate to audience demands and organizational mandate.

Case Selection

This thesis aims to shed insights on the reputational communication strategies employed by GEAs that advice international policymaking. The IPCC presents an important case study for reputational literature given its relevance within the climate change policymaking, specifically with respect to the UNFCCC. Furthermore, the IPCC is an eminent example of a GEA, as it is among the longest operating one. Active since 1988, the IPCC wears 34 years of assessments on its sleeve with only a few recurring GEAs surpassing it in age. As such, the IPCC blueprint - itself based on the Stratospheric Ozone Assessment - has been used as a model for subsequent GEAs, copying its successes and incorporating its lessons. As of now, 143 GEAs have been commissioned, 86 of which are recurring and 37 are recognized as intergovernmental (Jabbour & Flachsland, 2017). Out of these 37, only those conducted by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Service (IPBES) matches the IPCC in the scale and scope of the scientific effort. Furthermore, the IPCC is one of the few agencies that conducts GEAs that maintains an independent public profile for

analysis. Other long-running assessments, such as the Stratospheric Ozone Assessment and the World Energy Outlook maintain less of a public profile and only produce assessments, whereas other GEAs are a part of a larger organization such as UNEP. Within this sample of GEAs, the IPCC forms a unique and instructive starting point to test theory in a new administrative context and explore its nuances in the rich communication material it releases, after which future research can take up the influence of other characteristics, such as problem structure (IPBES), intergovernmentalism, and finally perform large-n quantitative analyses.

The age and scope of the IPCC assessments enables a deeper and more elaborate examination of reputational trends and participant insights. The longer time-span yields findings on long-term trends that can be compared to the development of younger GEAs to assess similarity. Moreover, GEAs rarely operate under annual cycles as they prove time-consuming. Rather, they span multiple years during which interview participants may not be able to speak freely regarding sensitive topics such as the influence of national interest, conflict or vulnerabilities of its established reputation. The older a GEA, the lower the proportion of participants that are not at full liberty to speak freely about these issues. In the case of the IPCC under the chosen time-frame, four assessment cycles have been completed, and one is still ongoing.

The IPCC also forms an ideal case study to study internal differentiation within agencies. As Carpenter (2014) notes, a reputation is partially constituted by the perceived identity among its constituent members, and consolidating these organizational subunit into a single image remains a difficult exercise (Busuioc & Lodge, 2017; Busuioc & Rimkutė, 2019; Carpenter & Krause, 2012). The IPCC case allows for the study of how the reputational focus can differ by department and is differentiated or subordinated to the organizational reputation. In the IPCC, each working group is tasked with assessing an aspect of the climate change problem. As a result, each working group is subject to a task specialization dependent on their mandate, and draws on their own pool of academic disciplines with their own epistemic culture. The case of the IPCC therefore serves as an illustrative example of how epistemic communities representing distinct facets of a policy problem consolidate their message into a consensual message. The second reason why the IPCC deserves particular attention is because it produces different types of outputs with different audiences. Whereas the SPMs are intended for the Panel audience, the IPCC also produces press releases, statements and announcements intended for a broader audience. The IPCC can thus differentiate its reputation-boosting depending on the outlet and type of document.

Sources of Data and Time Frame

This thesis draws on various types of material produced by the IPCC in order to detect patterns in the relative prominence of reputational dimensions over time. The IPCC's most emblematic products are its regular 'assessment reports'. These reports include a contribution of each working group, each dedicated to analyse a different facet of climate change – namely (i) the physical science basis, (ii) impacts, vulnerability, and adaptation and (iii) mitigation of climate change – together with a summary "Synthesis" report. On top of regular assessments, the IPCC produces special reports on narrower topics if agreed upon by the Panel. Excluding the Synthesis report, the full reports typically amount to a rough thousand pages. Authors have remarked the length, technical jargon and low readership of these documents (Howarth & Painter, 2016; Hulme et al., 2010; Yohe & Oppenheimer, 2011), making them unfit as a source of reputational signals. Rather, the importance of these reports resides in the fact that changes during the line-by-line review of the SPM must be consistent with the full underlying report. Hence, the SPMs of each working group and Synthesis report, their introductions, and prefaces, deserve focus, presuming these are most frequently read by the intended audience.

Besides the regular assessment reports, this thesis includes minutes of the executive committee (Bureau) and different types of press material (see Table 2Error! Reference source not found.). The meetings are relevant because they cover meetings of the IPCC leadership. They can be interpreted as a communication focussed on the Panel with an aim to reflect signals of transparency and accountability towards the Panel. Besides these meetings, a more public-oriented set of documents that includes statements, speeches, press releases and announcements serve to inform a wider audience of other experts, organizations and the public. These document types are interesting exactly because they are not subject to line-by-line approval, and offer the IPCC a possibility to signal reputational virtues freely to other audiences than the Panel without framing being under supervision of its political supervisors.

Though the IPCC was founded in 1988 and its first assessment report was produced in 1990, this analysis focusses on documents from the period of 1994 until 2022. The reason for this is the adoption of the United Nation Framework Convention on Climate Change (UNFCCC) in 1992 that disrupted the institutional landscape and role of the IPCC. A second reason was the lack of possible interview participants as many had reached seniority or had passed away. A third reason is that the data processing software could not analyse the first reports, and there consequently existed too few documents to analyse over that time period.

Table 2: Composition of Document Sample

Document Type	No.	No. Inspected
IPCC Bureau Meeting	47	5
Statement	36	4
Speech	4	2
Press Release	162	16
Announcement	14	2
Report Documents	32	3
Total	*295*	*32*

Finally, this thesis adds a qualitative component to supplement the quantitative data through the use of interviews. These interviews explore the perceptions of IPCC officials in leadership positions from the three working groups and across assessment cycles. Questions are directed at the identification of relevant audiences, the interpretation and weighing of the four dimensions of reputation, and the discussion of threats to reputation. These qualitative inquiries improve the descriptive account with an explanatory understanding, supplying reasons *why* certain dimensions and audiences are relevant, and *why* these change over time.

Operationalisation of Concepts

Quantitative Analysis

This research follows the method of Busuioc & Rimkutė (2019) in conducting a deductive keyword analysis to investigate the changes in the reputational repertoire over time. The outcome variables – the presence of reputational signals along the four dimensions- is operationalized as the percentage of words matching the dictionary for each document. A percentage of keywords is a solid operationalisation of reputational communication, as the relative presence indicates an importance adhered to specific framings. This shows the relative focus on a particular dimension in outputs.

The benefit of this approach stems from its simplicity and comparability. Though relative word counts could be interpreted as a reductive approach, such methods have proven to yield respectable levels of information, especially when it comes to dictionary classification according to known categories (Grimmer & Stewart, 2013). Importantly, applying a pre-existing keyword dictionary serves the auxiliary goal of this research to approach the IPCC from a theoretical angle that renders it comparable to other institutions (as opposed to single-case interpretive scholarship). The dictionary approach therefore opens up the possibility of relating the reputational uniqueness of the IPCC and its institutional position in international diplomacy with that of EU agencies – including advisory bodies that perform similar roles to the IPCC – within the EU supranational governance system.

The majority of the dictionary keywords are derived from Busuioc & Rimkutė (2019), and a small portion was inductively derived from IPCC documents based on Carpenter's (2014) definitions of the reputational dimensions and IPCC literature. The set of the deductive and inductively derived keywords is presented in Table 3 For each document type, 10% of documents were selected at random and inspected for additional keywords (see Table 2). These additions are justified because the IPCC employs a specific vocabulary to signal reputational dimensions that are unique to its specific role as an assessor of scientific evidence on the topic of climate change.

Technical Reputation

In BRT, *technical reputation* aims to capture the scientific and expert nature of the organization. It measures the presence of appeals to scientific accuracy, sophisticated methods and the acumen and credentials of its experts. Given that a sizeable portion of that nature manifests itself as mitigation pathways and historical climate trends (c.f. Pedersen et al., 2021), keywords such as *scenario* and *projection* are included. Secondly, one element not present in the dictionary of Busuioc Rimkutė (2019) are operationalizations of credentials. The IPCC signals the esteem of its scientists on occasion through announcing *prizes* and

Table 3: Deductive and Inductive Keyword Dictionary

Keyword categories	Keywords Busuioc & Rimkutė (2019)	Inductively Derived Keywords
Technical reputation	reliab*, test*, analy*, assess*, calcul*, data, evidence*, examin*, expert*, investigat*, knowledge, likelihood*, methodolog*, model*, profession*, qualitat*, quantify*, quantitat*, research, rogo*r*, robust*, science*, scientif*, studi*, stud*, technic*.	award*, confidence, data, fact*, finding*, modelling, prize, projections, (un)certain*, sound, scenario*, understanding,
Performative reputation	Achieved, achievement*, action*, adopt*_decision*, application*, assertive*, complianc*, comply, effecti*, efficien*, enforce*, goal*, improv*, inspect*, KPI* [Key Performance Indicator], objectives, oblige*, outcome*, output*, performance*, restrict* result*, success*, target*, timely*, deliver*	acceptance, complet*, comprehensive, determin*, ensure*, establish*, exhaustive, influential, leading, mandate, outstanding, policy-relevan*, rigorous,
Legal-procedural reputation	access_to_document*, access_to_information, appeal*, conflict*_of_interest*, consult*, control_standard*, control_system*, declaration*_of_interest*, formal*, independen*, internal_control*, internal_operation*, internal_system*, judicial*, legal*, liability, management_standard*, management_system*, procedur*, process*, protocol*, provisions, requirement*, rule*,	Feedback, guidelines, logically_organized, principles, recognize, review, terms_of_reference, code_of_conduct
Moral reputation	committed_to, common_interest*, consumer*, credibility, dialogue*, engagement*, ethic*, flexibl*, good_governance, honest*, inclusiv*, integrity*, moral, openness*, precaution*, Protect*, public_interest*, respect_for, safeguard*, societal*, transpar*, trust*, users, values,	confidentiality, diversity, gender, independent/ce, marginalized, representation, responsib*, responsiveness, sustainab*, sustainable_development, vulnerable,

awards recently obtained by its contributors. Thirdly, a pertinent feature of the climate change debate and the climate change counter movement is "doubt-mongering" , and uncertainty treatment features frequently in scholarly debate on how to improve IPCC reports (Oreskes & Conway, 2010). Hence, IPCC treatments of *(un)certainty* and *confidence* estimates should be interpreted as it flagging its scientific achievement and its knowledge of the climate change issue.

Performative Reputation

Following Carpenter's (2014) definition of the *performative* dimension, this aspect signifies the audience's satisfaction with the organization's decisions and for attaining its objectives. In the context of the IPCC, satisfaction with the final reports by Panel members is symbolized by approval during the line-by-line review, or *acceptance*. Furthermore, it is the mandate of the IPCC to "assess the state of the scientific literature on all aspects relevant to understanding climate change" (IPCC, 2013), and its objective to be *policy-relevant* . So on top of various action verbs of *establishing* a common knowledge base, adjectives such as *complete, comprehensive* and *exhaustive* signify fulfilment of mandate.

Legal Procedural Reputation

To convey a *legal-procedural* reputation is to emphasize one's thoroughness and reliance on socially accepted procedures, which play a pivotal role in science-based policy. As an assessment body, the IPCC follows the mantra "policy relevant without being policy prescriptive". It ought to inform rather than advise, and this makes the methods and processes through which the assessment is produced of specific importance to its legal-procedural reputation. For a "properly" conducted assessment, *guidelines, codes of conduct, reviews* and *feedback* play important roles in ensuring that bias is dealt with and all information is considered, similar to standard academic peer-review.

Moral Reputation

Finally, the *moral* dimension of reputation conveys ethically and morally defensible means and ends. Climate change is infamous for its disproportionate impact on the already disadvantaged (Sovacool & Linnér, 2016), and keywords such as *vulnerable* and *marginalized* flag an awareness of this moral issue. Furthermore, possibly value-laden ends in the climate change debate that were derived from the surveyed texts are *sustainability* and *sustainable development.* Finally, a particular discussion point in the IPCC literature is *geographic* and *gender representation* (Nhamo & Nhamo, 2017; Yamineva, 2017), and thereby *diversity* and *inclusion* in the authorship of IPCC reports. Though these serve instrumental purposes too, they principally constitute an ethical and moral end and are thus included as keywords.

Age

The independent age variable for each document is simply operationalised as the year the document was produced minus the year the IPCC was founded (1988).

Task Specialization

The independent variable of task specialization refers to the unique function of an organization. For this analysis, earlier developed typologies are too course to home in on this differentiation, as most specific label for the IPCC is 'advisory body' (Busuioc, 2013; Busuioc & Rimkutė, 2019). This research conceptualizes a GEA as a *type* of advisory bodies, and defines it in accordance with the review study by (Jabbour & Flachsland (2017, p. 193) as "*largescale, highly deliberative processes where experts are convened to distill, synthesize, interpret and organize existing scientific knowledge […] to inform decision-making*". Task specialization further occurs on the level of organizational subunits. In the case of the IPCC, each working group specializes in a different type of assessment. Working Group I specializes in a description of the climate system and observed climate change, resembling '*state of the environment'* assessments such as conducted by the European Environment Agency and countries like New Zealand and Australia. Working Group II specializes in assessing the vulnerability of bio-physical and socio-economic systems that resembles a more conventional *environmental risk assessment*, and Working Group III specializes in mitigation pathways, essentially assessing the impact of policies on slowing climate change. Descriptions of each task specialization and corresponding category are shown in Error! Reference source not found..

Table 4: Task Specialization of IPCC and Subunits

Type	Description	Task Specialization
Whole Assessment	largescale, highly deliberative processes where experts are convened to distill, synthesize, interpret and organize existing scientific knowledge […] to inform decision-making	Global Environmental Assessment (GEA)
WG I	Assesses the physical scientific basis of the climate system and climate change	State of the Environment Assessment
WGII	Assesses the vulnerability of socio-economic and natural systems to climate change, negative and positive …	Risk Assessment
WGIII	Assesses options for mitigating climate change through limiting or preventing greenhouse gas emissions	Trend Forecast and Impact Assessment

Qualitative Analysis

The qualitative component of this research is semi-structured and serves as a supplemental understanding. Still, it is necessary to operationalize what is meant with "IPCC leadership" to justify the selection of participants and how to include a time-dimension in these findings.

IPCC Leadership

The goal of the interviews is to document the perspectives of the IPCC equivalent of a senior civil servant. These possess the richest picture on the demands of their political principals as they typically work directly below and frequently meet with them. In the IPCC, the sample of scientists corresponding to this function is the IPCC Bureau. The Bureau consists of a three overarching leadership positions (IPCC Chair, and 2 IPCC Vice-Chairs), together with those responsible for the coordination of the three report sections[1], which today are 2 Co-Chairs and 7/8 Vice-Chairs per Working Group. The bureau meets to coordinate tasks and implementation and is present during the approval procedures of the SPMs with the Panel of delegates.

Time

To complement the patterns over time of the quantitative analysis, participants from different assessment cycles are selected. The duration of these cycles are listed in Error! Reference source not found.

Table 5: Time of Assessment Cycles

Assessment Cycle	Duration
1	1988 - 1990
2	1990 - 1995
3	1996 - 2001
4	2002 - 2007
5	2008 - 2014
6	2015 - 2022

[1] Technically, this group also includes 2 Co-Chairs of the Task Force, but these are not of interest to this research.

Data Collection, Preparation, and Method of Analysis

This section elaborates on the method through which the quantitative and qualitative data was collected and how it was consequently analysed.

Quantitative Analysis

Data Collection and Preparation

Documents were harvested from the IPCC website (https://www.ipcc.ch/) and its supporting archive (https://archive.ipcc.ch/). Though Bureau meetings were scraped directly from the websites with Rvest, all other material was manually collected, marked and converted into text files. Each document was marked with a 'Year' and 'Type' (Announcement, Speech etc.), and subtypes for the SPMs (WGI, WGII, WGIII, Special Report, Synthesis). SPMs were fused into a single document with their corresponding preface and introduction. Data preparation consisted of lower-casing, removal of meaningless symbols, numbers and spaces, but not stemming or removal of stop words. The reason for choosing not to stem keywords was to minimize the occurrence of keywords used in an irrelevant context. This analysis does not explicitly account for phrase context, so eliminating keyword uses not related to reputational performance is a priority. For example, *representation* as a noun will more frequently appear in a reputation-relevant context as a moral indicator, whereas *representative* could also relate to scientific results. Hence, all keywords were explicitly coded in the form most fruitful for finding reputation-relevant results.

The performance of word count checks revealed no significant discrepancy between the text documents and imported text objects. The resulting product is a text corpus akin to that of Table 6Error! Reference source not found.. Based on the deductive dictionary, word counts for each document and reputational dimension were calculated, and was divided by the total word count to obtain a percentual presence of reputational signals. Each outcome variable (*Technical, Legal-Procedural, Performative,* and *Moral Dimension*) was tested for a normal distribution of values via a cursory inspection of the histogram, a qqPlot, and a Shapiro–Wilk test (see Appendix A). All three inspections yielded an abnormal distribution for each outcome variable. The distributions follow a positive or right skewed distribution, meaning that a substantial amount of documents contain very few reputational signals, and a select small number is particularly rich in signals. Both quadratic and log transformations do increase the normality of the distributions, yet do not result in any distribution that passes the Shapiro-Wilk test. If one inspects the distribution of outcome variables by document type (Appendix B), the majority of the distributions appear sufficiently normal. This suggests that assumption of normality is violated in the full dataset due to differences across document types. The analysis proceeds with the untransformed dataset with the knowledge that the result of any statistical test ought to be interpreted with caution.

After calculating relative word counts for each reputational dimension and for each text object, these were aggregated into a mean value for each year, and a mean for each document type. Unweighted means were used because it gives equal importance to each document. To test the expectations regarding the development of the relative presence of reputational dimensions over time, four linear regressions models were conducted with the respective outcome variable (*Technical, Legal-Procedural, Performative,* and *Moral Dimension)* regressed against age. The figures testing the assumptions of the linear

Table 6: Excerpt from Text Corpus

Identification		Independent Variables					Raw Data	Outcome Variables			
ID	Name	Type	Assessment	Subtype	Year	Age		Technical	Perform	Legal_proc	Moral
10	PCC highlights the growing contribution of aviation…	Press Release	-	-	1999	11	*[Text]*	4.210526	1.754386	0.350877	0
21	AR3 Synthesis report	Report	AR3	Synthesis Report	2001	13	*[Text]*	3.40723	1.792115	0.212399	0.172574
38	Special Report on Carbon Capture and Storage	Report	NA	Special	2005	17	*[Text]*	1.453839	0.857564	0.47568	0.080397
44	AR4 Working Group I – The Physical Science Base	Report	AR4	WGI	2007	19	*[Text]*	4.507419	0.87195	0.365656	0.168765
57	Intergovernmental Panel on Climate Change strengthens processes and procedures at 32nd plenary session	Press Release	-	-	2010	22	*[Text]*	6.279435	2.825746	4.55259	0.156986
4	IPCC statement on New Scientist article	Statement	-	-	2012	24	*[Text]*	3.384615	0.769231	3.846154	0.769231

Table 7: Descriptive Statistics of Interview Participants

Assessment Cycle	No.	WMO Region	No.	Function	No.
2	2	Africa (I)	1	Working Group I	3
3	2	Asia (II)	1	Working Group II	2
4	3	South America (III)	1	Working Group III	5
5	3	North-Central America and Caribbean (IV)	1	Top Leadership	3
6	3	South-West Pacific	0		
		Europe	5		

regression model are found in *Appendix C: Regression Assumptions*

. These were supplemented with paired t-tests under unequal variance to test differences in the presence of reputational dimensions in documents. This means that the difference in the presence of reputational signal were calculated *per document* and then assessed on whether this was significantly different from zero. The resulting regression tables were exported, and the predicted regression lines of these models plotted on a graph alongside the mean values for each year. Next, four ANOVA models tested the differences between document types in the means of each outcome variable. The graphs inspecting the assumptions of the ANOVA are found in *Appendix D: ANOVA Assumptions*. Finally, to test the expectations regarding internal task differentiation, four plots – one for each reputational dimension - were made depicting the score of each working group and the Synthesis report. The entire R script is found in *Appendix E: R Script.*

Qualitative Analysis

Interview participants were selected through the IPCC websites. Interview candidates ought to have decision-making authority, as well as occupying an active role in plenary meetings with the Panel to give a proper account of the political principals as an audience. These criteria of IPCC leadership correspond with IPCC Bureau members: the executive IPCC Chair and Vice-Chairs, and the Working Group Co- and Vice-Chairs. These amount to 149 positions over the studied period, 35 of which were occupied multiple times by the same person. Of the 114 candidates, 74 had a public email address, 10 responded, and 9 were interviewed. 8 out of these 9 participants were male. Because some testimonies are politically sensitive, all participants are anonymized. Table 7 depicts descriptive statistics of participants regarding when they participated (Assessment Cycle), where they are originally from (WMO Region), and whether they coordinated activities of a working group, or occupied a higher leadership role (Function). When cited, there are referred to as [Letter; time of office]. There is a balance in time and function, but not in gender and geographic representation. Participants received a consent form stating the terms of their participation (see Appendix F: Consent Form), together with the questions and a summary problem statement guiding the research question.

The semi-structured interviews consisted of open questions and were conducted over video call. One interview was conducted partly over telephone and one interviewee provided written answers. Face-to-face interaction and an open structure aid information gain and flow when interviewing elites (Harvey, 2011). Interviews lasted in between 45-75 minutes.

Reliability and Limitations

At the heart of the reliability and limitations of any research are questions of internal and external validity. External validity covers concerns over the generalizability of findings to a broader set of cases, whereas internal validity pertains to concerns over the reliability of drawn inferences (Toshkov, 2016).

The external validity of single-case studies is inherently questionable, because generalizations to a population require multiple cases to isolate the effect of the independent variable. Single-case studies cannot control for external influences or random error, so one cannot confidently argue based on this thesis that conclusions are applicable to the broader class of GEAs. This would require a larger sample of agencies conducting GEAs, preferably with some variation in their characteristics, such as mandates, issue salience, scope and heterogeneity of the political audience. Nevertheless, three considerations are important to contextualize this lack of external validity. First, external validity was not the main goal of this research. Rather it was theory testing in a new context and the application of a reproducible research method that enables comparisons of the IPCC with other organizations. Second, the IPCC is sufficiently important to merit a single-case study without generalizable findings, as it is arguably the most important GEA. Thirdly, should the results confirm the expectations, that means that the IPCC is comparable to the broader class of advisory bodies in terms of the reputational virtues it communicates. This shifts the burden of proof to those wishing to argue that other GEAs do not conform to these broader patterns established within the category of advisory bodies. Naturally, further research is necessary to confidently generalize these findings to other GEAs.

Internal validity may be compromised as the result of issues with operationalisation of concepts, data collection, applied statistical methods and alternative explanations. A reliance on previously operationalisations of concepts reduces the chance of flawed operationalisations. One possibility is that the deductive dictionary is insufficiently exhaustive. This thesis tried to reduce this error through inductively including new keywords informed by GEA literature and IPCC practices. At the same time, there exists the risk that these new keywords have no reputational connotations. Determining what does and does not convey reputational meaning is an imperfect science. Despite this, words are interpreted with higher reliability as an indicator of reputational profiling than organizational actions, as words are performative and intended to create impressions and images, while actions may arise from a multitude of motivations. In terms of the operationalisation of “communications”, the dataset includes all relevant instances with the exception of social media such as Twitter and LinkedIn. The chosen types of communication were in part inspired by earlier work that focusses on official reports . It is possible that patterns in reputation are different on social media because it appeals to a different audience, and communications are generally shorter. This could bias results or paint an incomplete picture, but this can be simply amended by qualifying the inference that it is uncertain whether reputational patterns in official communications are the same as those on social media. In sum, one can reasonably argue that the keywords and gathered documents are appropriate enough operationalisations of reputational dimensions and agency communications to yield valid inferences.

Table 8: Overview Assumptions of Statistical Tests

Assumption		Indicator	Result
General	Normality	Outcome variable normally distributed	Data is not normally distributed, but is within document types
Paired t-test	Normality	Outcome variable normally distributed	Data is not normally distributed,
	Homo-scedasticity	Standard deviation between a factor 0.5-2	Yes, so test uses unequal variance
	Independence		Assumption holds
Regression	Normality	Residuals normally distributed	Assumption holds
	Linearity	Random pattern of residuals around fitted values	Legal-Procedural Model deviates
	Homo-scedasticity	Variance in residuals is approximately equal	Slightly compromised
	Independence	Measurements independent	Assumption holds
ANOVA	Normality	Residuals normally distributed	Moral model violates normality
	Homo-scedasticity	Variance in residuals is approximately equal	Slightly compromised
	Independence	Measurements are independent	Assumption holds

Furthermore, the internal validity of the inference relies on the valid usage of statistical tests. For these tests to yield valid results, the assumptions cannot be violated. The three tests used are the paired t-test with unequal variances, linear regression models, and the one-way ANOVA. A summary of all relevant assumptions and whether they hold is given in Table 8. All tests share the assumption of independence and a normal distribution (of outcome variables or residuals). Reasons for arguing against independence are (i) documents produced shortly after each other are slightly related in terms of content and framing, and (ii) if communicating a reputational profile is a balancing act between dimensions, scores depend on each other. These reasons are overshadowed by the fact that (i) the majority of documents are produced with weeks in between, and (ii) the keywords for each dimension are distinct and any dependency effect negligibly small, so one can uphold the assumption of independence with confidence. For the normal distribution of the outcome variables, this assumption does not hold, but it does for the majority of the residuals. Though this warrants caution with the interpretation, observed effects are typically either incredibly significant, or not at all, so it is unlikely that qualitatively false inferences are drawn as a result of this abnormal distribution.

For the paired t-test, homoscedasticity does not hold for the majority of comparison between outcome variables (see Appendix A:Error! Reference source not found.), so all paired tests assume unequal variance and use Welch/Satterthwaite approximations. For the regression models, there is the assumption of homoscedasticity, linearity, and normality of residuals (for inspection, see Appendix C: Regression Assumptions

). For the linearity assumption, residuals should follow an approximately straight line when plotted against the fitted values, which is roughly the case in all models. The legal-procedural model poses a small deviation. Homoscedasticity is somewhat compromised in both the regression models and the ANOVA, meaning that bias in the error term due to outlier values. This may in turn compromise the comparison between different document groups.

Subject to most scrutiny are the results from the qualitative interviews. While descriptive accounts of *what* happened tend to be reliable, interpretive accounts of *why* it happened ought to be corroborated by multiple parties of different backgrounds. In a sample of 10 interviewees, 90% of which were male, and 70% from an Annex-I country, there is a risk of a "global-north bias".

4.Analysis

This section presents the results of the analysis. First, it describes the findings of the quantitative analysis. These comprise: descriptive statistics of the dataset, trends over time on the basis of regression models, testing differences in presence of reputational dimensions within documents using paired t-tests, the results of the ANOVA regarding differentiation in reputational signals among document types, the quantitative change in communication output over time, and an inspection of internal differentiation among working groups. The results of the qualitative analysis supplement these findings with how the IPCC positions itself in the face of a heterogenous audience, the change in the role of the public over time, and the perspective of IPCC leadership on the relevance of reputational dimensions for the IPCC.

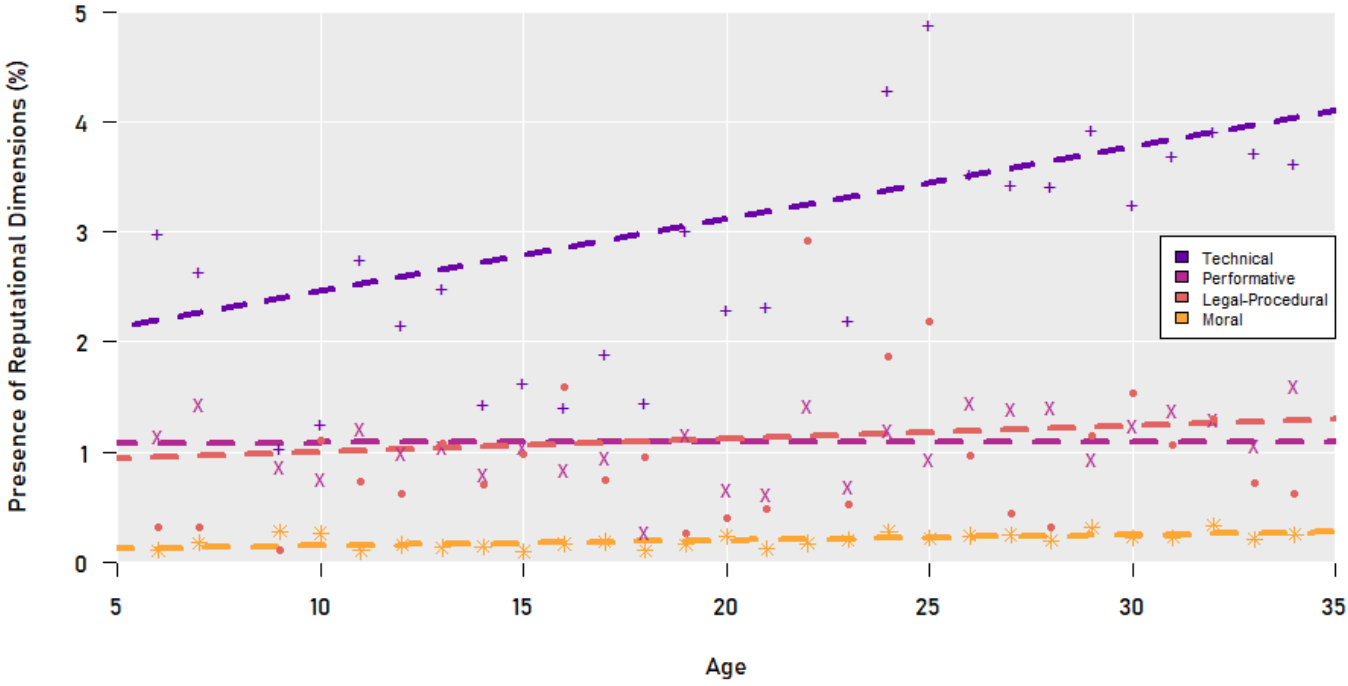
Quantitative Analysis

Table 9 depicts the descriptive statistics regarding the presence of reputational dimensions across all documents. The technical dimension is never absent and shows the highest mean. Its maximum value reaches over 11% of the total document, while also exhibiting the highest standard deviation. The high maximum of the legal-procedural dimension compared to the performative and moral dimension is interesting as well, especially because the third quartile value is already lower than that of the performative dimension. This implies that in extraordinary cases the IPCC incidentally hammers on its procedural character with great zeal compared to the performative and moral dimension, but that is not in general more present than the performative dimension. The maximum value for the legal-procedural dimension (Statement of 27-02-2010) happens to be a document emphasising the lengthy procedures the IPCC uses to synthesize assessments and avoid biases that was produced in the aftermath of the "Climategate" email hack. This implies that this incident posed a significant reputational threat, causing the IPCC to firmly establish its commitment to procedure. From the descriptive statistics, one can glean that the technical and legal-procedural dimension are emphasized with great variation in scope and emphasis, suggesting that these qualities are to be emphasized under specific occasions. In contrast, the performative and moral dimension are characterized by a much smaller standard deviation, meaning that their low presence is quite consistent

Table 9: Descriptive Statistics

Descriptive Statistic	Technical	Legal-Procedural	Performative	Moral
Min.	0.10384	0	0	0
1st Qu.	2.15612	0.20284	0.73043	0
Median	3.24544	0.625	1.10691	0.17271
Mean	3.53356	1.08466	1.1904	0.22434
3rd Qu.	4.84418	1.34245	1.56668	0.31778
Max.	11.2676	8.3871	3.47222	2.1021
Standard Error Mean	0.112076	0.078453	0.039947	0.016666
Standard Deviation	1.911869	1.338301	0.681439	0.284301

Figure 1: Trend in the Presence of Reputational Dimensions Across Time



Moving to the change over time, Figure 1 shows the trends in the relative presence of reputational dimensions in the IPCC's communication. Dots indicate the aggregated yearly unweighted average presence of a reputational dimension, while lines represent the predicted regression line through disaggregated data points. The graph provides strong evidence that the technical dimension is the most conveyed dimension in the organization's communication at any moment in time. This observation confirms Expectation No. 2 , as the technical dimension was and remains the most important one, though it was not expected to increase over time. After the technical dimension, the performative and legal-procedural dimension tie on the second place. Both dimensions remain largely constant over time, though the former appears to slightly reduce over time, while the latter increases. Both dimensions are present to a significant extent, indicating that an appeal to procedural strengths or its ability to deliver satisfying products are not uncommon. This partially contradicts Expectation No. 3 and Expectation No. 4, because the legal-procedural dimension was expected to be emphasized more in communication than the performative dimension. Looking at the trend in the presence of the moral dimension one finds support for Expectation No. 5 and a falsification of Expectation No. 6. Under the reasonable explanation of a moral framing contradicting the depoliticizing role of scientific advice, the IPCC does not convey adherence to normative ideals in its outward communication. Whatever the possible benefit of such a reputation, one can assume this benefit is trumped by a negative effect. Even if it is more important because GEAs shift to a focus on solutions, this is explicitly circumvented in communication attempts.

The paired t-tests in Table 10Table 10. The difference between the technical dimension and all other dimensions is consistently significant with a confidence interval of 95%. The moral dimension is consistently significantly less present in documents. As already suggested by the figure, difference between the legal-procedural and performative dimension within documents is insignificant. The counterevidence for Expectation 3 and 4 is open to multiple interpretations. Depending on the frame of reference, one can interpret the legal-procedural dimension as less, or the performative dimension as more important than anticipated. The high outliers in

Table 10: Two Sample T-Test over all Documents

Reputation Dimension *(mean)*	Legal-Procedural		Performative		Moral	
	Mean Δ	p-value	Mean Δ	p-value	Mean Δ	p-value
Technical *(3.540520)*	2.444067	< 2.2e-16***	2.352997	< 2.2e-16***	3.314067	< 2.2e-16***
Legal-Procedural *(1.096453)*			-0.09107028	0.2901	0.8700003	< 2.2e-16***
Performative *(1.18752)*					0.9610706	< 2.2e-16***
Moral *(0.2264531)*						

Table 11: Regression Model with Age as Predictor

Reputational Dimension		Estimate	Pr (> | t |)	Adj. R^2
Technical	Intercept	1.81609	4.06e-05 ***	
	Age	0.06513	6.08e-05 ***	0.05025
Legal Procedural	Intercept	1.0908174	5.65 e-04**	
	Age	-2.334e-04	0.983811	
Performative	Intercept	0.873296	7.74e-08 ***	
	Age	0.012025	0.0396 *	0.011
Moral	Intercept	0.093846	0.1562	
	Age	0.004949	0.0422 *	0.01065

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

the legal-procedural dimension do suggest that it is put to use with greater effect, perhaps only to respond to threats.

Looking at the regression Table 11 underlying the lines in the graph, one can observe substantial differences between the intercepts and slopes of the coefficients. In both models, the technical dimension is the only one to increase over time with a significance of $p < 0.01$. The coefficients in the performative and moral dimension are significant at the 0.05 level, but the coefficients are so low, that it would take 83 years for the performative dimension to increase with one percentage point, and 202 years for the moral dimension. These are therefore not deemed to signify an increase over time. Interestingly, the coefficient of age for the legal-procedural dimension is statistically insignificant in both models, suggesting that the legal-procedural dimension did not increase in importance over time, providing further evidence against Expectation 4. Though the primacy of the technical dimension was expected, its rise over time was not. This, combined with the stability of both the legal-procedural and its equal presence to the performative dimensions was not hypothesized based on the life-cycle model and the task specialization of the IPCC. Rather than the IPCC diversifying its reputational profile, it doubled down on its technical reputation. To summarize, the IPCC sends a consistent message of technical competence to its audiences and fortifies this reputational strength over time. Outliers in the legal-procedural dimension suggest that, on special occasions, the IPCC expends great effort to convince audiences it adheres to due procedures, but that overall, the legal-procedural dimension is not more

significantly present than the performative dimension, and neither appear to change significantly over time. Finally, the IPCC seems averse to any moral framing and consistently omits reference to normative ideals such as trust, representation and the public interest.

Reputation Differentiation in IPCC Communication Material

As discussed, agencies can harness different modes of communication and differentiate their reputation-boosting strategy accordingly. Delving deeper into the reputational composition contained in various document types, some relevant differences appear. Figure 2 displays a series of boxplots depicting the distribution of values per outcome variable across document types, and the average values. Some of these documents, such as the SPMs and the bureau meetings focus on the Panel and professional audience, whereas press releases, announcements, statements and speeches are intended for the broader public audience. All document types lack the presence of the moral dimension. The fact that *no* type engages with *any* moral framing reinforces the idea that moral framings are antithetical to the IPCC's task specialization. It also corroborates the similarity between the IPCC - and intuitively GEAs of its kind – with EU advisory bodies on this aspect. Furthermore, documents exhibit little variation in the performative dimension in addition to a relatively low overall presence. Comparing Figure 2 with Figure 3 that depicts the average value per document type, one notices that the performative dimension is consistently present across document types with little variation from the mean. What is clear is that the IPCC sends out a constant flow of performative signals, and hardly differentiates it to the occasion. If strategic considerations were to play a role, one would expect more variation in values across documents, document types, or time in this dimension. Given that this is not the case, it is likely that the IPCC does not actively concern itself with how it comes across along this dimension.

Figure 2: Distribution Values of Reputational Dimensions across Document Types

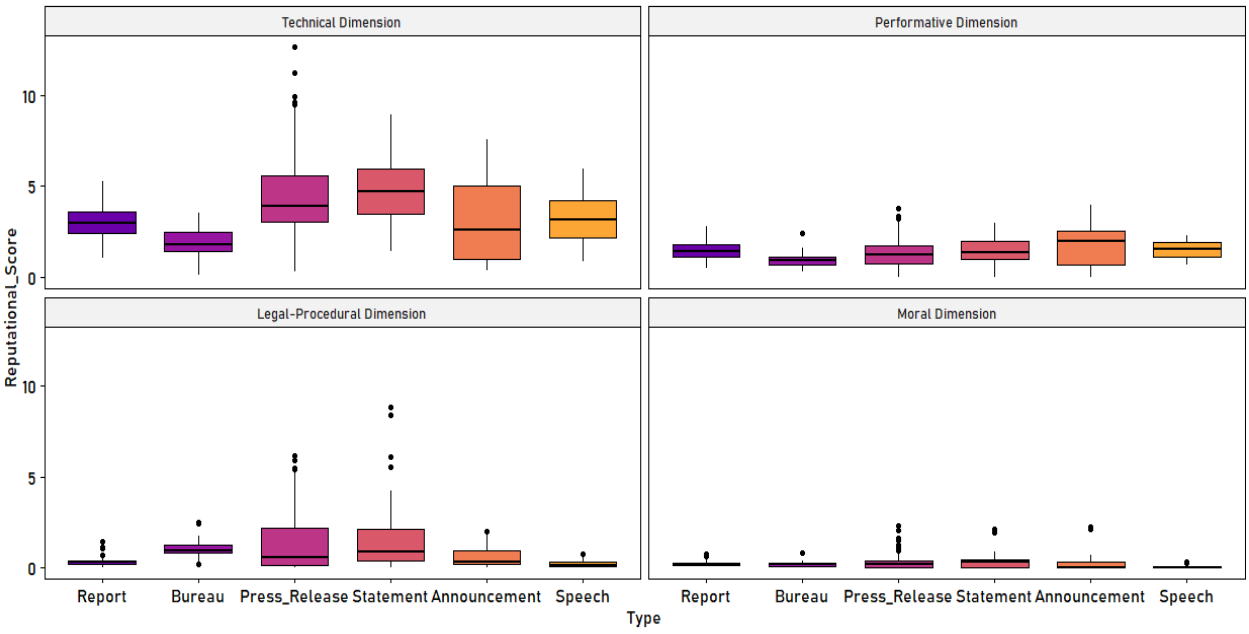


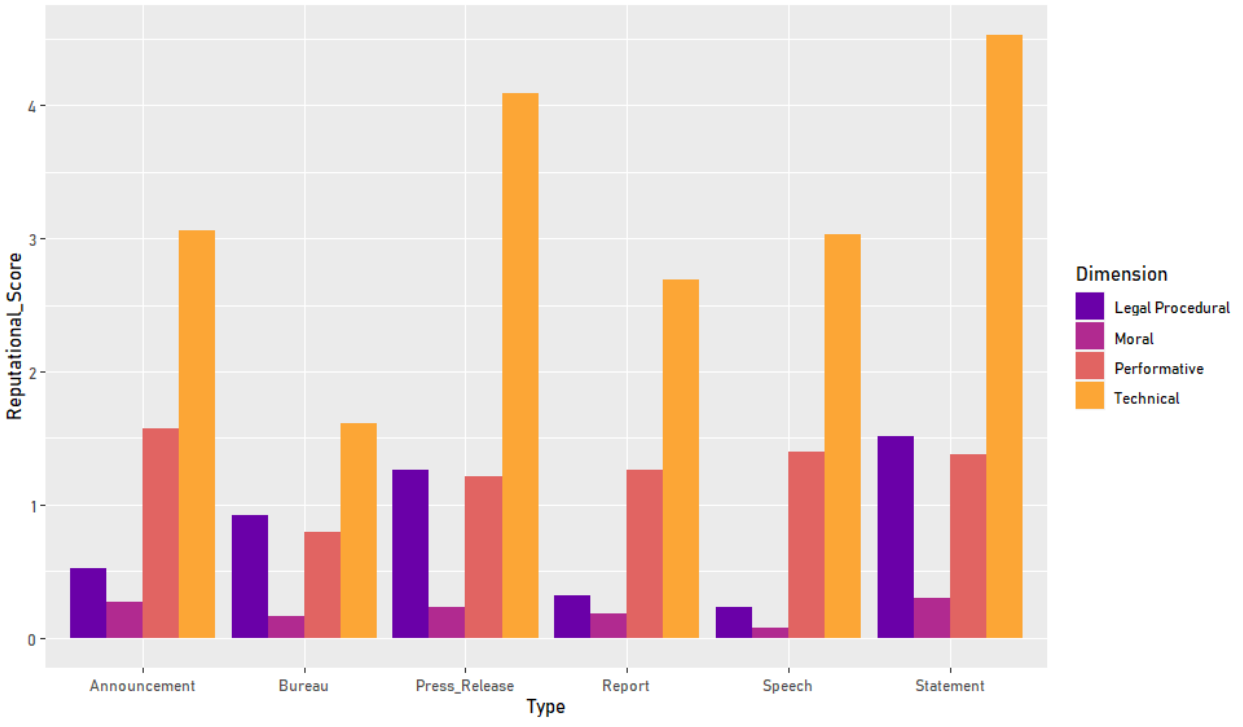
Table 12: ANOVA Test Results with Document Types as Predictor

Reputational Dimension		Sum.sq	Mean Sq	F value	Pr(>F)
Technical	Type	285.3	71.33	26.33	<2e-16 ***
	Residuals	774.7	2.71		
Legal Procedural	Type	36.1	9.033	5.346	3.64e-4 ***
	Residuals	483.3	1.690		
Performative	Type	10.98	2.7455	6.349	6.6e-05 ***
	Residuals	123.68	0.4325		
Moral	Type	0.469	0.11737	1.461	0.214
	Residuals	22.970	0.08032		

Signif. codes: 0 '***' ; 0.001 '**' ; 0.01 '*' 0.05 '.' ; 0.1 ' '

More variation across documents is visible in the technical and legal-procedural dimension. Along these dimensions, communication directed at the broader public is richer in reputational language than that directed at the political audience. In particular, the legal-procedural dimension shows a wide distribution with high outliers in the press-releases and the statements, while it is near-absent in other document types. On the one hand, this variation is intuitive because communication materials such as announcements, press releases and statements serve the purpose of image-creation or reputation-cultivation better than scientific assessments and minutes do. On the other hand, this does not occur along the performative dimension.

Figure 3: Average Presence of Reputational Dimension across Document Types

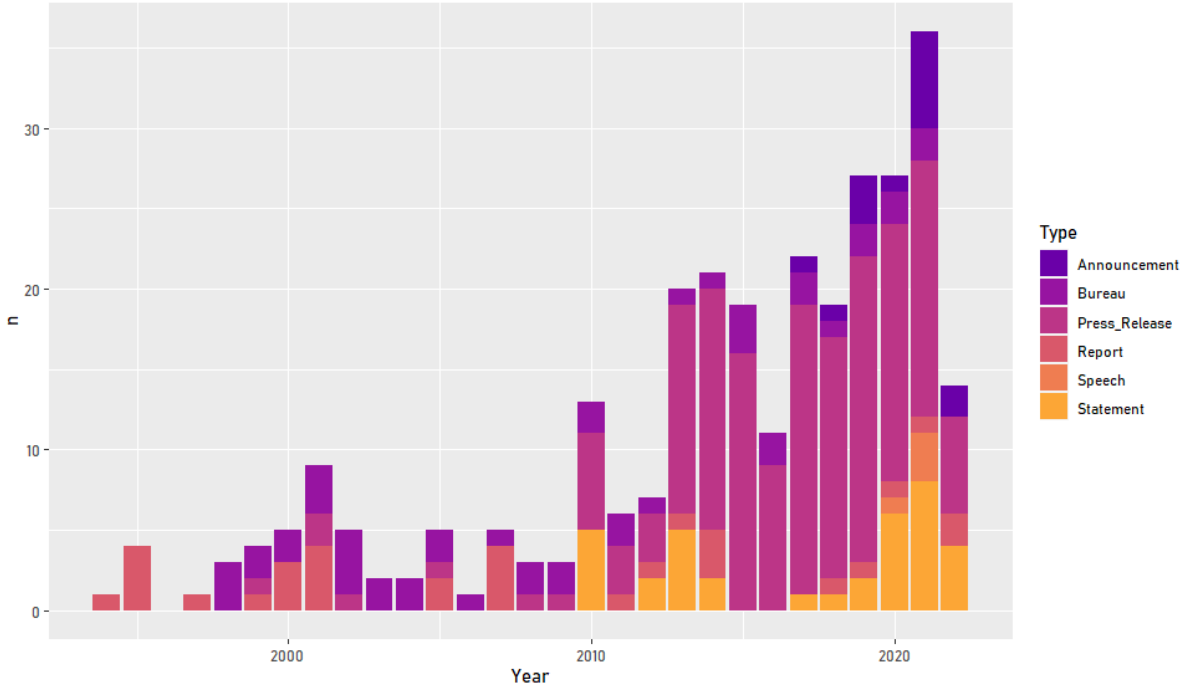


These findings support the idea that the legal-procedural dimension is more of a strategic concern to the IPCC than the performative dimension is. When it comes to the broader audience, the IPCC actively tailors its communication with the effect of boosting its technical and legal-procedural reputation more clearly than it does with its reputation of performance. However, this this appeal to the legal-procedural dimension remains too infrequent to assert it changes over time, though documents emphasising the dimension have become more prominent. All the while, the moral dimension is not referred to in any communication, suggesting that the IPCC does not wish to appeal to the normative ideals of any audience. When inspecting differentiation between document types, the primacy of the technical dimension is further confirmed, as is the aversion of the moral dimension, further proving Expectation No. 1, Expectation No. 5 and refuting Expectation No.6. For the legal-procedural dimension and performative dimension, it reveals that the former is more of a strategic concern and to be emphasized more to particular audiences than the latter. This supplies evidence for the conclusion that the legal-procedural dimension is more important than the performative dimension, but not that it increases over time.

Development of Communication Strategies

On top of a pattern in the reputational emphasis of various document types one can observe two broad patterns in the frequency of document types over time as depicted in Figure 4. Firstly, when looking at the summed total of communication material produced each year, one notices that the IPCC did not produce significant amounts of public material on a regular basis in its early years. In 2010, the quantity spikes, and after a short lag steeply increases. The average yearly presence of material nearly quadruples past the year of 2010. This patterns reveals that one significant change in the reputation management of the IPCC is the sheer quantity of material produced. One could say the IPCC became more 'extroverted'. This extroversion is not self-evident by virtue of the IPCC being a GEA, as other GEAs do not maintain such a public profile at all.

Figure 4: Frequency of Document Types over Time



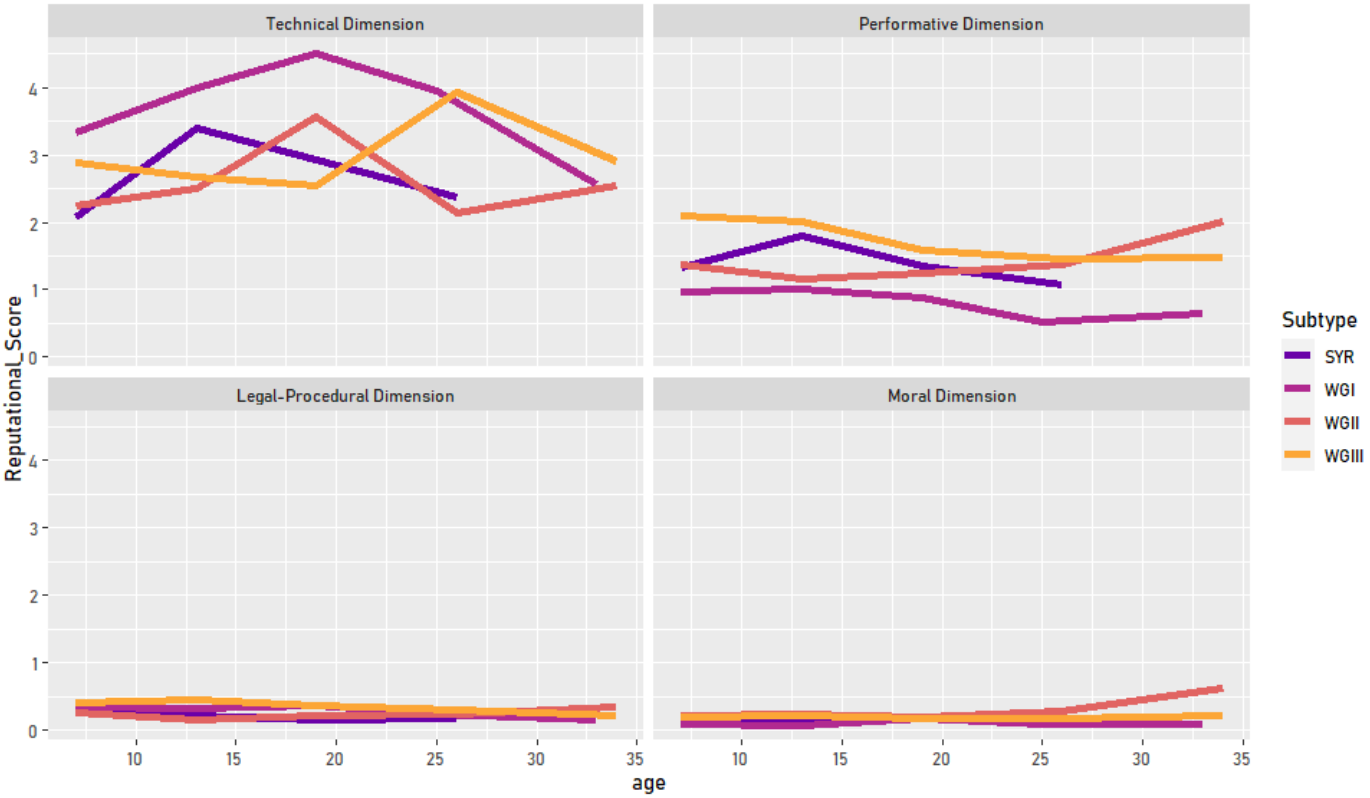
The second pattern relates to the composition of produced material. After 2010, the diversity of communications increases, in particular regarding communication material that is rich in reputational signals, such as press releases, announcements and statements. Note also that these are the documents in which the legal-procedural dimension shows most variation. This indicates that a fair share of change in the IPCC's reputational signals can be explained by the *type* of documents the IPCC produced as well as the quantity in which these were produced, and not necessarily from a change in framing of the characteristic SPMs (see also Figure 5). In other words, not only did the IPCC become more reputationally astute as time passed by increasing the mentions of reputational virtues in their documents, but it seemed to overall change their communication strategy qualitatively as well, producing documents that were more concise and readily understandable by a wider audience. These documents happen to more strategically tap into the legal-procedural dimension, proving that procedural matters certainly played a stronger role as soon as communication reached out to a broader audience. Based on these findings, one can conclude that the IPCC became more extroverted and engaged rather explicitly in a public reputation building after 2010, though its main effect has been the fortification of the technical reputation.

A possible explanation for this change is the occurrence of the "Climategate Scandal". In 2009, over 1,000 emails were stolen and publicized. A selection was taken up by scepticists and framed as proving scientific misconduct, negating the basic findings of human-caused global warming and suggesting tribalist activism on the part of IPCC authors (Beck, 2012). Caught in the limelight, such a reputational threat could induce the IPCC to be more attentive to the public perception of the IPCC image.

Internal Sub-Unit Differentiation

An agency's reputation is an easy heuristic for people to refer to and ascribe various capacities to, but in the case of the IPCC it obscures that the agency is composed of three distinct working groups each with their own task specialization. Figure 5 depicts the relative presence over time of reputational dimensions in the SPMs of the working groups, as well as the Synthesis report. The working group SPMs are representative of the task specialization, while the Synthesis reports represent their consolidated identity. Only two reputational dimensions are notably present in the emblematic SPMs: the technical dimension and the performative dimension. The legal-procedural and moral dimension are neither distinctly present, nor distinctly different from each other, refuting *Expectation 8*. Even though a vulnerability analysis of socio-economic systems is the most appropriate place to frame a message along the lines of compassion for the affected, or 'a guardian of the public good', nothing as such appears. The general aversion for a moral framing for the whole IPCC dominates the framings a subunit can employ. Tentative evidence emerges for *Expectation 7* and *Expectation 9*. The technical dimension is on average more present in the SPM of working group I, focussing on assessing the state of the environment, if compared to the Synthesis report. The performative dimension is more present in working group III, focussing on impact analysis, than in the Synthesis report, though this effect is less pronounced.

Figure 5: Presence of Reputational Dimensions across Time and Working Groups



The results do broadly conform to the pattern of differentiation based on the subgroup specialization. The IPCC is not one holistic organization and each working group employs its own vocabulary, emphasizing different aspects of reputation in meeting the expectations of the Panel. Working group I, specializing in a purely scientific description of the climate systems (State of the Environment assessment), lays emphasis on the technical dimension more than would be required by the final report summary, and working group III, specializing in impact assessment of policies given pre-determined climate goals emphasises performance. Though a moral emphasis was hypothesized, its lack is not surprising. The fact that values and moral implications are absent across all document types demonstrates that its avoidance is part and parcel of its reputational strategy. Although the task of the working group II lends itself to a moral frame, the importance of avoiding that frame on an organizational level takes precedence. To conclude, sub-unit follow similar patterns of framing of reputational strengths according to task specialization, but are restricted by the consistency between their mandate and the reputational profile the overarching agency wishes to convey.

Qualitative Findings

Audiences

i. Panel Members

In the face of a heterogenous audience, an agency is expected to prioritize the demands of audience members that have the highest capacity to mobilize resources against it. Interviews reveal that national interests influence the demands of delegations on the final framing of SPMs. The preferred framed level of urgency poses the main axis along which Panel members hold diverging expectations. The strongest cleavage existed between oil producing countries with preferences for watering down the message and on some fronts and especially early on a preference for outright denial, versus those affected in the most immediate term by rising sea-levels (i.e. AOSIS) or with a more ambitious climate policy in general (Europe) (B:90-95; C:02-14; A:02-07*;* C:02-14F:96-01). The alignment of national interest with the preferred conveyed sense of urgency is expected and relevant. It indicates that countries suspect political ramifications for economic development and international law as a result of scientific assessments even when that assessment does not conduct original research, nor proposes advice (B:90-95; C:02-14). A sense of urgency favours some more than others. "that is not a judgment, it is reality" (C:02-14). For example, one figure showing national emissions by GDP was dropped from the SPM because of objections from developed countries (C:02-14).

The consensus-driven approach is a characteristic element of GEAs and necessary to secure legitimacy in the eyes of political audiences (A:02-07, E15-22). Typically, it is the countries with a strong economic interest in halting climate change policy that mobilize to dilute the framing, whereas more activist countries aim to maintain as much from the original proposal of the scientists (A:02-07, B:90-95, D:96-07). Though these delegations can be considered most influential because they are most willing to exercise a veto, IPCC leadership is not most attentive to their demands as would be expected. Rather IPCC leadership actively attempts to persuade delegates to keep as much of the original substance as possible. One extreme response of IPCC leadership involved a delegate of a major global power with ties to the fossil fuel lobby that unilaterally vetoed a special report on renewables. As the delegate went outside for a phone call, the chair called for further objections against the report and after the remaining delegates remained silenced, he approved the commissioning of the report. Consequently, the delegation withdrew funding (A:02-07).

This raises two important points for a reputational perspective of the IPCC. Firstly, that not everything is about procedure or expertise when it comes to the Panel audience, in contrast to what their output suggests. Rather, this behaviour is reminiscent of a performative reputation, of inducing compliance with a framing, and an assertiveness towards Panel members that bend the scientific narrative in bad faith or for obvious political reasons. There appears to be a discrepancy between how it acts in private to political supervisors, and the reputational message it emphasises to the public. The nature of diplomacy may have a role in this. Secondly, an explanation of this behaviour does not necessarily put the veto player at the centre of attention. It could equally be a demonstration of performance to other delegations, showing that it protects the integrity of the consensus process. In any case, there appears to be mixed evidence for Expectation No. 1.

ii. IPCC Scientists and the Academic Community

At the centre of the strong technical reputation of the IPCC is the sheer number and diversity of experts that contribute and speak highly of it (E:15-22). One interviewee stressed how participation in the IPCC is an honour in their country and a sign of esteem (C:02-14). Carpenter (2014) notes how such esteem considerations and self-identification with the organizational mission influence the employee's willingness to defend the organization. In the IPCC, this arguably manifests itself in a willingness to contribute *pro bono*, but this has come under strain because of two factors. Firstly, and most pressing is the increasing workload associated with the formalized and increasingly meticulous process of review (C:02-14). Secondly, scientists may become disillusioned with the IPCC if political action does not follow. Interviewees described a sentiment of frustration with the sluggish pace of political action in response to an increasingly urgent message of a problem that requires political action (B:90-95; A:02-07; C:02-14). These sentiment indicate an expectation of scientists' time being valued and not 'wasted' on bureaucratic processes, and of the product they create serving a purpose.

This exposes an unanticipated trade-off between reputational strengths, mediated through the employee's affiliation with the organization. The attempt to enhance the procedural legitimacy of the IPCC through various reforms burdens the contributing scientists, decreasing the satisfaction derived from participating. Because they contribute pro bono, diluting through 'bureaucratization' the meaningfulness of work risks alienating the experts the IPCC's technical reputation is based on. This could increase the susceptibility to reputational threats on the long-term, as participants may not defend the IPCC as ardently, or may choose not to contribute anymore. Though this outcome seems improbable, the mechanism and its effect are reasonable.

iii. The Public Audience

The increasing reputational awareness and the diversification in the document types point to the fact that public image creation became increasingly important over time. The lack of initial public profiling appears to have been due to the interpretation of its mandate. IPCC leadership readily acknowledges the importance of the public and the relevance of producing understandable and informative material for them, but emphasises that its mandate is to advice governments, not to educate the public (C:02-14; H:08-22; C:02-14; I:*90-01*). The IPCC started as an informal advisory body operating outside public view (B:90-95; I:90-01), creating little need to consider an audience broader than the Panel. Only after repeated allegations from climate scepticists was the IPCC drawn into the limelight (B:90-95). Still, obstacles to broader audience engagement lingered. The negotiated framings of the assessments were too politically sensitive to paraphrase or translate in a text, hindering engagement (A:02-07), and it lacked funds and authority to communicate independently with a broader audience (H:08-22). More recently, however, leadership lends greater importance to public engagement with the main purpose of providing information (A:02-07; C:02-14), but also with a realization that impression management matters now that the IPCC has taken centre stage in the climate regime (B:90-95).

These testimonies confirm the trend found in the quantitative analysis of increasing concern for the public image of the IPCC. The initial introversion appears to have been driven by

limited agency in determining its public relations, but also by a lack of the need to communicate because of low problem salience and little publicity of the IPCC (C:02-14). Only later arose the realization that public engagement could

Reputational Dimensions

i. Technical Reputation

Diverging from the quantitative analysis, interviewees tended not to emphasize the technical dimension. When asked, participants would confidently assert the technical reputation of the IPCC by referring to the amount of scientific literature incorporated, or the scientists involved. To some degree, participants seemed to believe the IPCC was saturated with expertise and commented on the limited options available to further increase it. At a certain point, "*there is no way to select people purely on quality, because every nominated expert is qualified enough based on their CV*" (C:02-14). "*when you have 600 nominations from the best scientists for 150-200 author positions, it is nigh impossible to distinguish based on their credentials"* (A:02-07). The notion that the fundaments on which to build the technical reputation have been present from early onwards contrasts with the quantitative analysis. High-profile scientists consistently assessed high-quality evidence, but the agency has only recently scaled up its effort to cultivate its image along this dimension. Perhaps IPCC officials internally considered the expertise of the agency as self-evident, while only later realizing the benefit of actively nurturing this reputation in the public.

ii. Legal-Procedural Reputation

Though the quantitative analysis showed legal-procedural signals to be less present in outward communication than the technical dimension and equally present as performative signals, nearly every interviewee stressed the importance of the legal-procedural dimension in the conduct of the IPCC, some to the point where the process was emphasized as most important. The line-by-line review process commands authority among the Panel audience through co-ownership and prevent criticisms from governments because they were themselves involved (C:02-14). On a more general level, geographic and gender representation, as well as the elaborate process of constructing the assessment and dealing with comments eradicates bias and thereby generates credibility of its technical character in the eyes of its political and public audience (F:96-01; C:02-14; H:08-22).

Interviewees also stressed the linkages between technical expertise and processes for the IPCC. The quality of a good assessment hinges on the procedures and processes through which it comes about (A:02-07; C:02-14; F:96-01; H:08-22). Moreover, threats to the technical dimension of an assessment body tend to take the form of *missing voices*, of relevant and scientifically credible information being excluded. The painstaking process of multiple review rounds, where every comment is publicized, noted and responded to and every putative expert can participate act as a potent and often-cited defence against allegations of poor quality (C:02-14; A:02-07). One interviewee proudly stated that every scientifically substantiated comment during his time made its way into the report, making any criticism to the expertise contained baseless (A:02-07).

These testimonies refer directly to the two mechanisms for which the legal-procedural dimension was expected to be relevant. The relational process of drafting the report secures political legitimacy, while the task specialization of the IPCC as an assessment body direct

focus to the procedures through which assessments come about. Furthermore, the legal-procedural dimension certainly plays a prominent role in the mind of IPCC leadership, both as a reputational strength, as well as a defence against possible allegations. This does not explain the discrepancy between the quantitative and qualitative data. IPCC leadership adheres great importance to legal-procedural elements, whereas the agency only incidentally and strategically appeals to it in its communications. Unlike the performative dimension that may be important to demonstrate in private but not to communicate to the public, there is a decent rationale for why the IPCC would nurture its legal-procedural reputation to the public, as diversification yields more robust reputations. One plausible explanation that aligns with GEA theory is that the IPCC need not rely on public communication to prove its legal-procedural character to its most important audience: the Panel. It can do so through organizational reform and interpersonal contact during plenaries. This still requires a reason for why the IPCC sees little benefit in cultivating the legal-procedural to the public. One could argue that its reputation benefits from public ignorance regarding procedures. The IPCC legitimizes itself as an expert body through a firm boundary between facts and values - between science and politics. Communicating the procedures could dissolve the illusion of its depoliticization and independence, and reveal processes of co-production. This could be spun by antagonistic parties as politically motivated science and consequently undermine the more important technical dimension.

iii. Performative Reputation

The performative dimension behaved as expected in the quantitative analysis. The interviews offer a reliable explanation for this consistently low emphasis. When asked about under what condition Panel members would be satisfied with the IPCC's conduct and what constitutes a successful assessment in their judgment, one interviewee stated that it ought to be a scientifically sound report, containing expert information (B:90-95). Others, especially later on, emphasized an exhaustive assessment (A:02-07), and again others emphasized that it would need to be objective, transparent, fair and accessible, with good selection procedures (C:02-14), as well as a geographic balance in authorship and (H:08-22; G:08-22). Put differently, a satisfactory performance or satisfactory assessment of the IPCC rests on whether it was conducted properly. No testimony indicated a direct role for assertiveness or inducing compliance of any kind.

iv. Moral Reputation

The interviews supply substantial evidence that the IPCC tries to maintain a firm boundary between fact and value through avoiding moral framings in their outputs. One interviewee expressed the need for caution in framing an aspect of the IPCC's reputation as moral because of its normative connotations that could be associated with having a political agenda (C:02-14). Any appeal to values could suggest a preferred course of action, which contradicted the fundamental role of the IPCC to be policy descriptive without being policy prescriptive (A:02-07). Signalling a moral reputation would undermine the credibility of the technical reputation. When asked how an "ethical" or "moral" IPCC would act, appeals were made to scientific values such as scientific integrity, transparency and openness (G:08-22; H:08-22; E:15-22). These examples are interesting because they are included in the dictionary, so if they are important, one would expect them to be present in the quantitative analysis in greater measure. In not emphasizing this dimension, the IPCC behaves like reputational literature would suggest. It takes a risk-averse stance to adopt a decision of a more moral

appeal towards the public out of fear it would pose a reputational threat to its unique reputation: its technical character.

5.Conclusion

This section presents a summary of the key elements of the thesis project. It first repeats the research question. It then discusses the research design geared towards answering that question, presents the main findings from the analysis, and connects these to the theory. Based on that summary, it evaluates the contribution to the academic literature, discusses limitations and provides directions for future research.

The guiding RQ reads: *"How does the IPCC's reputational behaviour change over time, and to what extent can this behaviour be explained by bureaucratic reputation theory?".* To answer this question, the thesis adopted a mixed-method design. It studied all IPCC communications and summary reports over the period of 1994-2022 through a quantitative keyword analysis. Using a deductive dictionary supplemented with inductively derived keywords, it explores patterns in the presence of reputational signals along the four dimensions over time, among document types, and across organizational subunits. It adds depth to these findings with qualitative semi-structured interviews with IPCC leadership officials in office during that time.

Table 13: Overview Results Of Expectations

No.	Expectation	Status	Note
1	*The IPCC is most responsive in signalling reputation to audience members with a vested interest in fossil fuels.*	Mixed	
2	*The IPCC puts more emphasis on the technical dimension of reputation in its communication documents, and this primacy is not expected to change over time*	Confirmed	Further increased over time
3	*After the technical dimension, the IPCC puts most emphasis on the legal-procedural dimension in its communication, and this increases in relative prominence over time*	Mixed:	Did not change on average, but did increase in strong incidental emphasis
4	*After the technical and legal-procedural dimension, the IPCC puts most emphasis on the performative dimension in its communication, and remains constant over time.*	Mixed	Overall equal to legal-procedural, but did stay constant
5	*The IPCC emphasises least the moral dimension of reputation in its communication, and this does not increase over time*	Confirmed	
6	*The IPCC emphasises least the moral dimension of reputation in its communication, but its relative importance increases over time*	Rejected	
7	*The technical dimension shows a higher presence in the Summary for Policymakers of Working Group I than in the Synthesis report*	Confirmed	
8	*The moral dimension shows a higher presence in the Summary for Policymakers of Working Group II than in the Synthesis report*	Rejected	
9	*The performative dimension shows a higher presence in the Summary for Policymakers of Working Group III than in the Synthesis report*	Confirmed	

How does the IPCC's reputational behaviour change over time? The quantitative and qualitative analyses combined expose three ways in which the IPCC's reputational behaviour changed over time. Firstly, the IPCC became more reputationally aware, or 'extraverted', after 2010 and produced more communication material in pure quantitative terms. This development is likely caused by a public scandal that posed a threat to its reputation, combined with an undercurrent of increasing public attention. Secondly, the IPCC diversified its repertoire of communication and produced material that is richer in reputational signals and intended for a more diverse audience (i.e. press releases, statements and announcements). Following the scandal, the agency started to differentiate and tailor its message more depending on the intended audience, with more frequent and stronger appeals to the technical dimension, and more incidental but still forceful appeals to the legal-procedural dimension. Thirdly, rather than diversifying the reputational profile of the IPCC, the agency appears to continue to develop and fortify is strongest reputational asset: its technical reputation. Interviewees are adamant about the commitment to procedures and highlight various efforts to improve procedures in the eyes of the Panel, and some documents attain high levels of references to the procedural dimension. Still, the overall results indicate that this is more reactive than a true element of a purposeful strategy to signal its procedural character and virtues to the public. This is surprising given the theoretical work describing how fundamental processes are for GEAs and the fact that interviewees unanimously agreed with its importance and utility as a defence against contrarian allegations. Why, then, does the IPCC not cultivate such a reputation for that to the public, especially after a scandal?

To what extent can this behaviour be explained by bureaucratic reputation theory? The analysis proves that BRT can be applied to the IPCC communication with fair success. Based on the idea of task specialization, the analysis provides strong evidence for the primacy of expertise in communication, the lack of any appeal to a moral or performative reputation. The theory even proves that organizational sub-units further differentiate their reputation based on their assigned task, as long as it does not conflict with the overarching organizational reputation. BRT can also make sense of the significant change in approach to reputation management after 2009, as well as provide alternative explanations for the lack of a legal-procedural reputation. Above all, the IPCC seeks to maintain its technical reputation which depends on depoliticization of the assessment and would be hesitant to take any action that would irreversibly threaten this unique reputation. In a public debate with high problem salience, polarization and politicization, the public engagement of an agency with an apolitical mandate could itself be interpreted as political activism.

One can interpret the change after 2010 as a realization in the agency that reputation management towards the public is a necessary component of maintaining their trust and consequently government support. Without support from the public audience, the legitimization role of the IPCC to the government audiences erodes. Without reputation management to present a counternarrative, scandals can quickly diminish a reputation. There was a need to cultivate stronger reputation, but there looms a possible danger in the diversification of reputational legitimization strategies. Once caught in the limelight, the agency has no choice but to fortify its unique technical reputation.

Contribution to the Literature

Firstly, this thesis makes an empirical contribution to the literature on GEAs and the IPCC. Rather than relying on the interpretive CRELE framework that must continuously adapt to match what fosters information uptake (Kowarsch et al., 2017), this thesis builds on conceptually related BRT with descriptive indicators based on reputational strengths. In doing so, it renders the IPCC and to a lesser degree GEAs comparable to agencies conventionally studied in public administration scholarship. Moreover, it is the first attempt to quantify and exhaustively describe the efforts of the IPCC to legitimize itself in the eyes of the public through its communications. Furthermore, this methodology can serve as a starting point for the further analysis of GEAs. The analysis yields the novel empirical insight that, despite the fact that IPCC leadership adheres great importance to procedure and values of transparency and integrity, it does not cultivate such an image among the public but rather sticks to depoliticization. This lends credence to the objection that the IPCC operates under the flawed 'deficit model of public understanding' (Beck, 2012; Dudman & de Wit, 2021). This centres around the idea that public trust can be cultivated and doubts eliminated through the quality of scientific output (Nisbet & Scheufele, 2009; Suldovsky, 2017). Whether this is the underlying ideology is uncertain, but it certainly matches the pattern of public engagement.

Secondly, this thesis makes a theoretical contribution by heeding the suggestion of Carpenter and Krause (2012) to advance BRT by testing its applicability in a novel institutional context. In doing so, it illustrates differences in the development of the reputational profile of the IPCC compared to EU regulatory agencies. As they come to terms with the politicization of their environment, EU agencies move beyond expertise to develop new legitimization strategies over time with appeals to their performative dimension in line with their discourse of output legitimization (Busuioc & Rimkutė, 2019). In contrast, the IPCC does not diversify its legitimization strategy with appeals to the legal-procedural dimension conforming to the throughput legitimacy characteristic of GEAs. It does engage more with the public after a reputational threat, but presumes that public trust can be restored through fortifying its position as a bulwark of depoliticized scientific advice. Reputed scholars of science-policy interfaces have argued how this emphasis on depoliticization is untenable and even damaging to public trust (Beck, 2012; Beck & Mahony, 2018; Dudman & de Wit, 2021; Hoppe et al., 2013; Hulme et al., 2010). This thesis provides a plausible explanation that diversification is itself a risky and irreversible strategy – a kind that reputation-driven agencies avoid (Carpenter, 2014). The increased risk arises from depoliticization being even more characteristic of the unique reputation of the IPCC and perhaps also GEAs than for EU regulatory agencies. Hence, agencies like the IPCC may need to keep up a façade to the public of depoliticization, even while its environment becomes politicized.

Finally, this thesis comes with implications for the future reputation management of the IPCC. As mentioned before, GEAs have become more solution-oriented over time as they co-evolve with the policy problem (Jabbour & Flachsland, 2017), and that requires the integration of diverging normative viewpoints (Castree et al., 2020; Kowarsch et al., 2017). GEAs tend to develop for the sake of remaining relevant to policymakers in directions that further blur the boundary between science and politics and hinder being policy relevant without engaging with values. Consequently, there is a stronger need to *act* in accordance with other reputational dimensions. Assuming that the lack of diversification is sincerely motivated by rational considerations of reputational risk, reputation management becomes increasingly complicated as the IPCC moves into this direction. It is pushed to engage more with legal-

procedural and normative matters for one audience that would be dangerous to advertise to the other. Though more research is needed, this raises the question as to whether a reputation built on depoliticization is a viable on the long term.

Limitations of this Research

This thesis is subject to some shortcomings and limitations, primarily when it comes to the research design. The fundamental shortcoming of a single-case study is generalizability. This thesis does not allow for reliable assertion regarding similar GEAs but is restricted to conclusions about the IPCC. However, generalizability was not the goal of this thesis. Rather, it was to provide support for the application of BRT in a new context, and explorations of how this new context informs BRT hypotheses, for which single-case studies are appropriate. There are three shortcomings that do obstruct

The first limitation stems from the quantitative analysis. Keyword analyses are fundamentally reductive methods that can miss the complexity of language. When it is deductive, it runs the risk of not being exhaustive. Because this research focussed on a novel administrative and organizational context, and relied on a pre-existing dictionary, a balance had to be struck between comparability (i.e. staying true to the original dictionary) and exhaustiveness (i.e. inductively derive more keywords. A keyword-in-context analysis, where keywords are counted when they meet conditions regarding the context they appear in, could have ensured more nuance and meaningful word-counts, yet this was beyond the scope of this thesis. Finally, this analysis cannot account for keywords used in different contexts. For example, 'principle' or 'independence' could be used in a legal-procedural context, but also in a moral context. In the analysis of advisory bodies with an adherence to the scientific method, this poses a significant limitation as what constitutes "moral" behaviour overlaps with what constitutes "appropriate" behaviour

A second limitation is that the timespan covered by the analysis is not the full lifespan of the IPCC. This reduced timespan was motivated by the foundation of the UNFCCC that disrupted the administrative context, a lack of interview participants, and the fact that the first SPMs were not decipherable without sophisticated coding methods. This blind spot could hide a significant change in the presence of reputational dimensions in the early years and mask how the IPCC grappled with the co-existence of the new and similar UNFCCC secretariat. Still, there is reason to believe this effect is not significant as it regards a small number of documents. It does not qualitatively change the observation that communication multiplied and diversified after 2009, and framings within documents were relatively stable regardless (see Figure 5).

Another limitation is nature of the data itself. The values of the outcome variables within the entire text corpus as well as the aggregated yearly averages are abnormally distributed. All distributions were skewed to the left, with a long tail made up of a small number of high-value outliers. An explanation for this shortcoming is the different document types, present in varying quantities. In effect, this compromises the validity of the conducted statistical tests. The consequences of the abnormal distributions pertain mainly to the confidence in the increasing line of the technical dimension and the significance of the influence of document types in influence outcome variables. Even if one excludes the statistical models, these findings are still visually confirmed by Figure 1, Figure 2 and Figure 4.

Directions for Future Research

This research project supports the assertion that the IPCC's actions are guided by a motive of reputation management. As a single case study, it cannot generalize such findings to the broader category of cases the IPCC can be considered a part of. This prompts venues for future research. Firstly, the IPCC is a GEA that includes examples such as IPBES and the World Energy Outlook. A promising next step is to perform a systematic quantitative analysis of the presence of reputational dimensions in communication material across the full sample of agencies conducting GEAs regularly (for a sample, see Jabbour & Flachsland, 2017). This enables one to control for and explore the influence of aspects of the administrative and organizational context. These include the organizational structure of GEAs; the relationship with political oversight; the problem structure and issue saliemce; compensation of the scientists involved; and finally whether the mandate allows for solutions and policy prescription. Alternatively, performing an in-depth assessment from a BRT perspective on IPBES could yield further in-depth insights on why IPBES is frequently received in a more favourable light as a boundary organization (c.f. Beck et al., 2014; Borie et al., 2021; Brooks et al., 2014; Turnhout et al., 2016).

A second promising avenue relates to a similar set of cases: international environmental bureaucracies. One interviewee indicated that the foundation of the UNFCCC secretariat (SBSTA) caused IPCC scientists to reconceive their role, identity and consequently their unique reputation (B:90-95). Other scholars have described how this new mediating actor influenced the credibility and legitimacy of the IPCC's scientific reputation (Hulme & Mahony, 2010; C. Miller, 2001). Biermann and Siebenhüner (2009) shed great insight on the influence of these executive and coordinating bodies and it would be worthwhile to compare a reputation-based perspective with their assessment of autonomous influence to see how these two relate.

Finally, this thesis illustrates the influence of internal task differentiation on the reputational repertoire of organizational sub-units. Moreover, it exposes that public communication do not necessarily reflect leadership commitment to certain reputational dimensions. A contrast between internal perspectives and external reputation management promises an interesting avenue of future research, especially given the the psychological connections that Carpenter (2014) draws between individual identity and organizational reputation. In the case of the IPCC, one could perform survey-based or Q-methodological research to probe what contributors and leadership think the IPCC's reputation ought to be and compare that with government delegation and the public. The methodology of Overman et al. (2020) provides a starting point for such an investigation.

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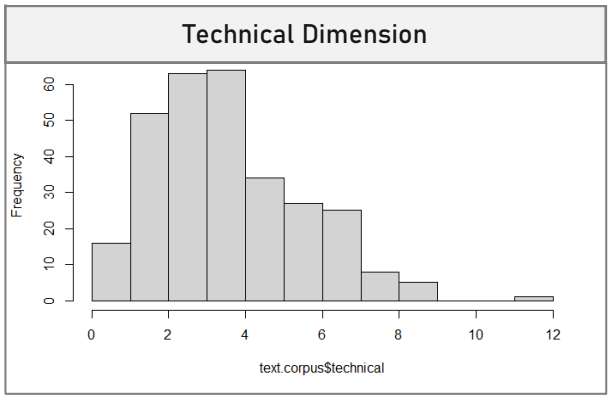
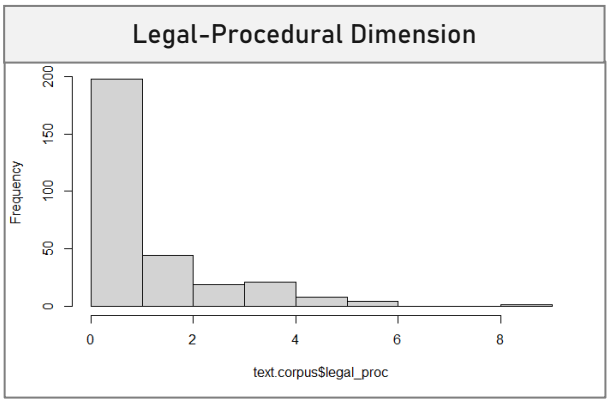
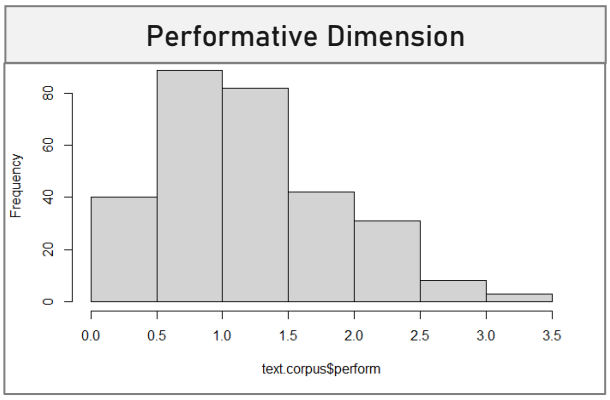
Appendix A

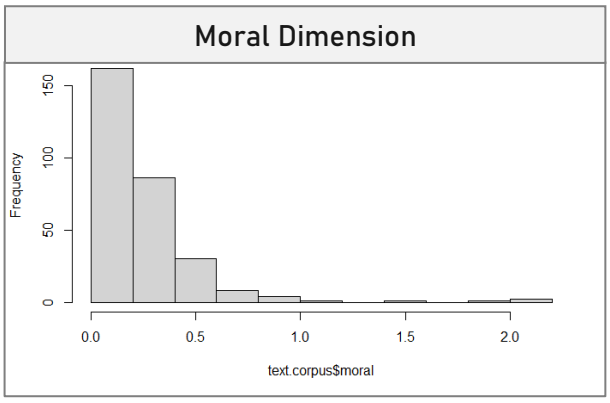
Histogram Normality of Distribution for Outcome Variables

Histograms of Outcome Variables

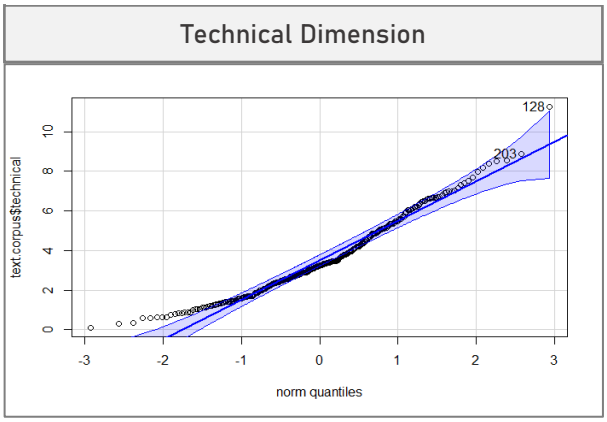


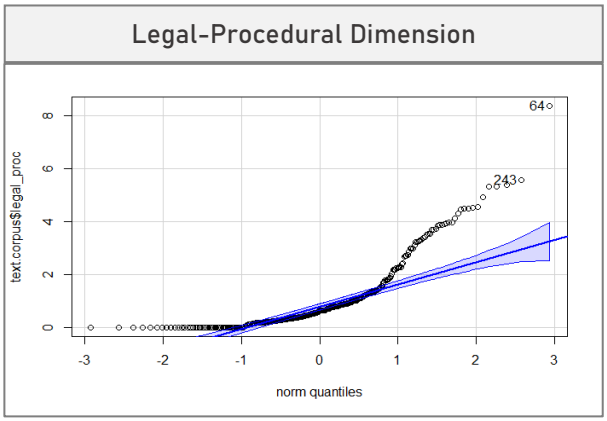


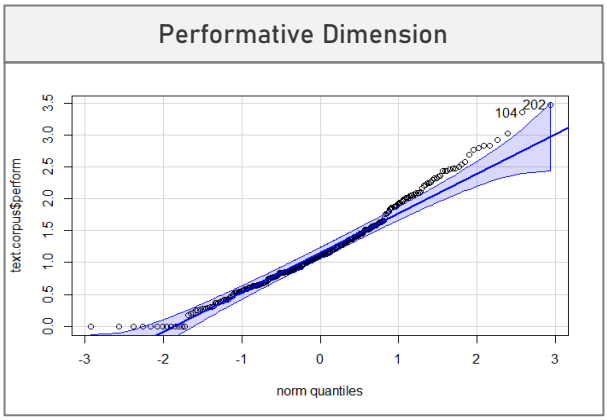


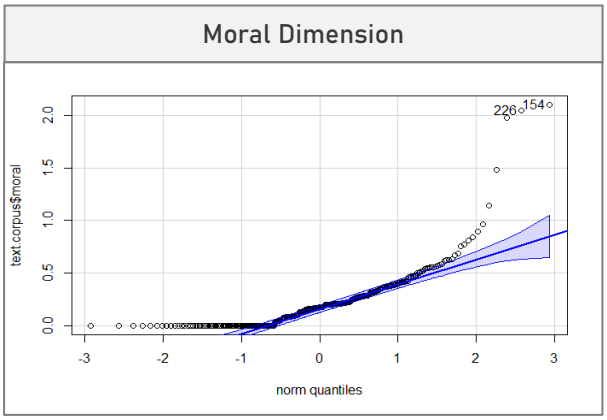


qqPlots of Outcome Variables

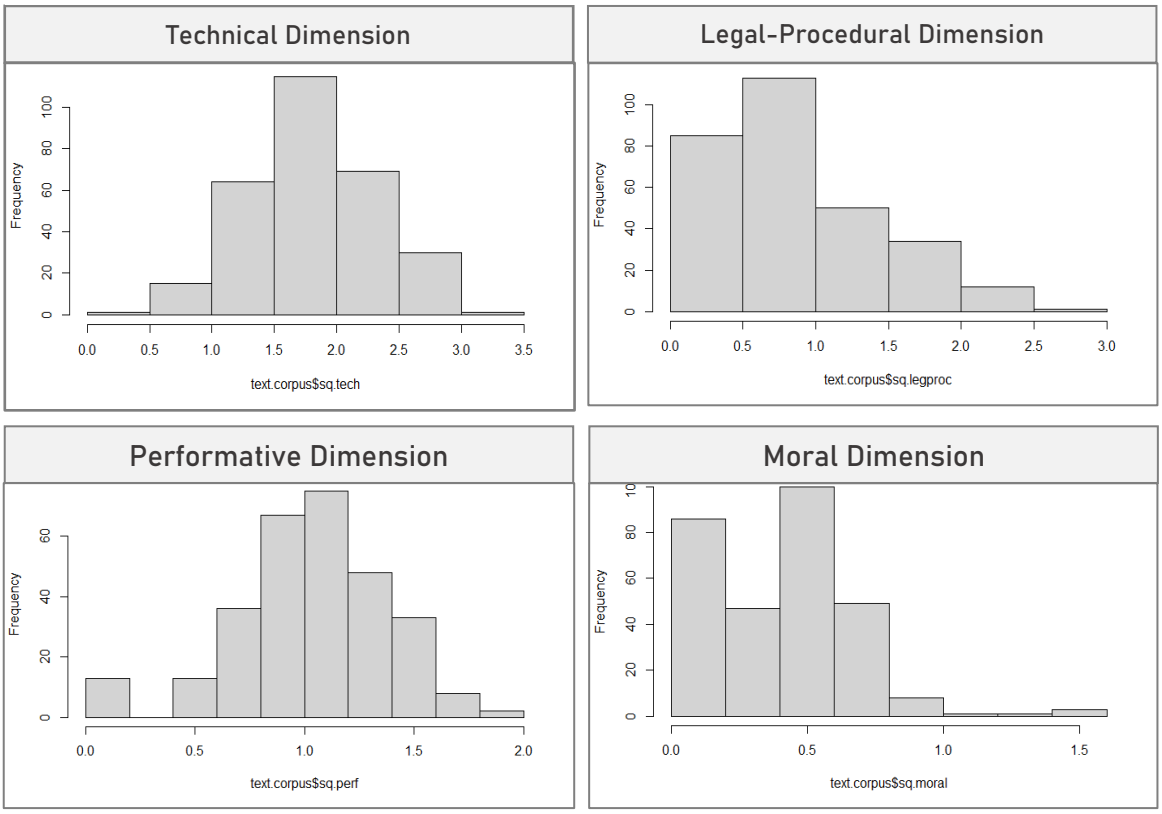




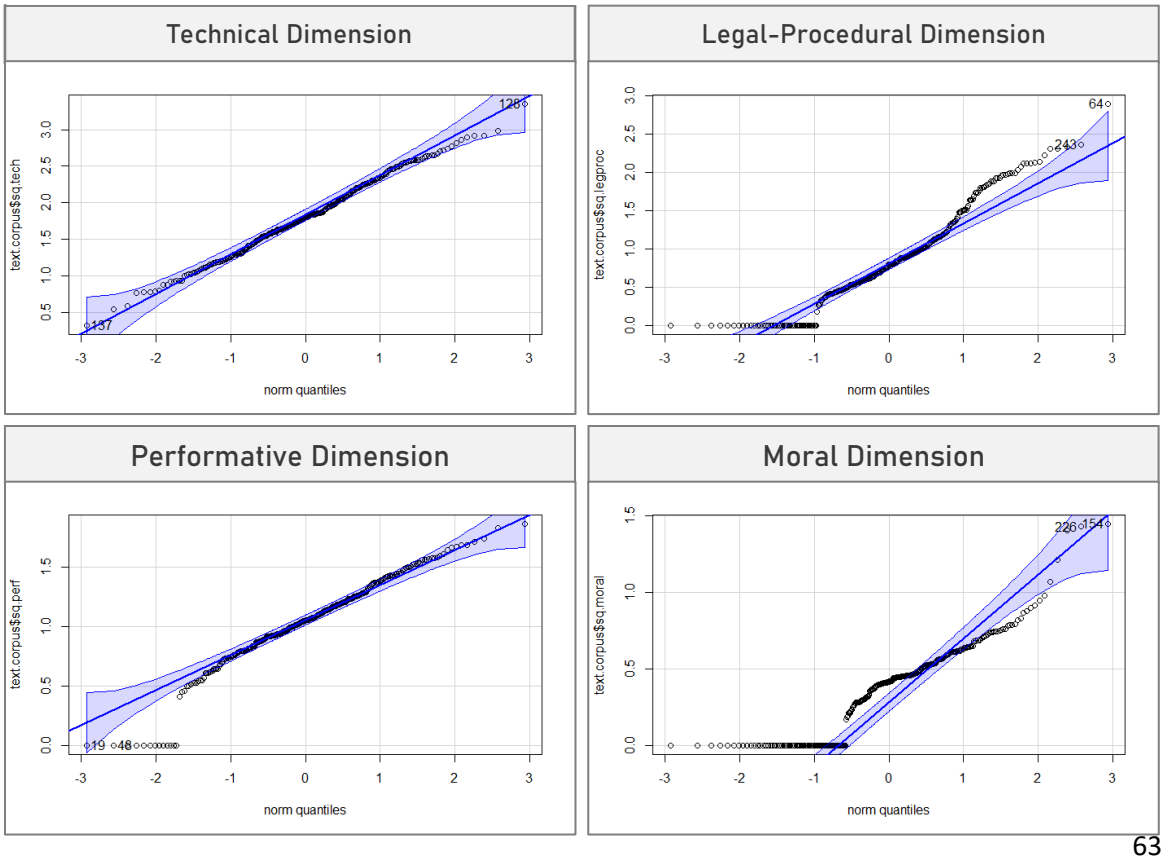




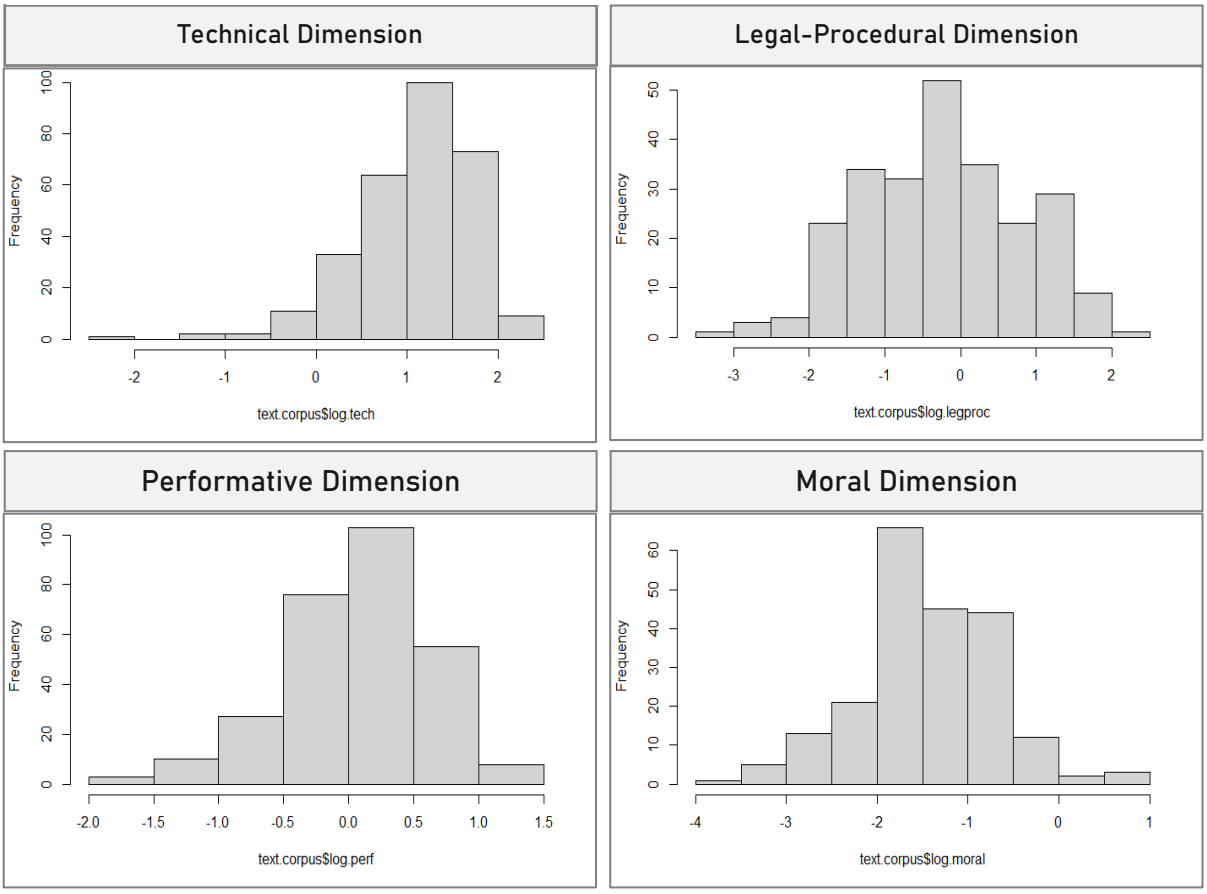
Histograms of Outcome Variables (Squared)



qqPlots of Outcome Variables (Squared)



Histograms of Outcome Variables (Log)



Results of Shapiro-Wilk Normality Test for Whole Sample

Shapiro-Wilk Normality Test for Untransformed Dataset

Dimension	W	p-value
Technical	0.95996	2.973e-07
Performative	0.97192	1.588e-05
Legal-Procedural	0.76436	2.2e-16
Moral	0.69518	2.2e-16

Shapiro-Wilk Normality Test for Squared Transformation

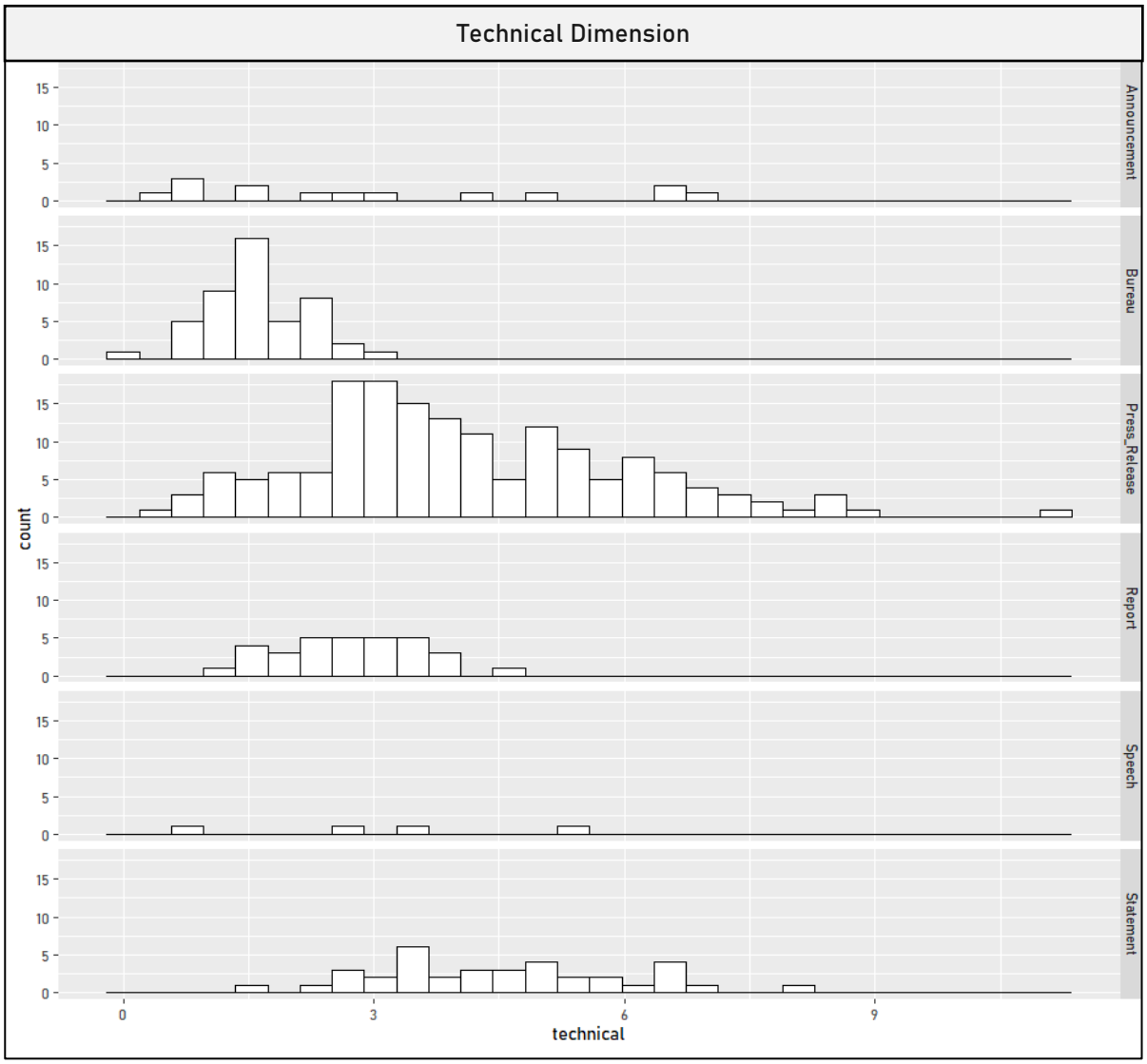
Dimension	W	p-value
Technical	0.9963	0.7232
Performative	0.954	5.235e-08
Legal-Procedural	0.94567	5.698e-09
Moral		1.624e-12

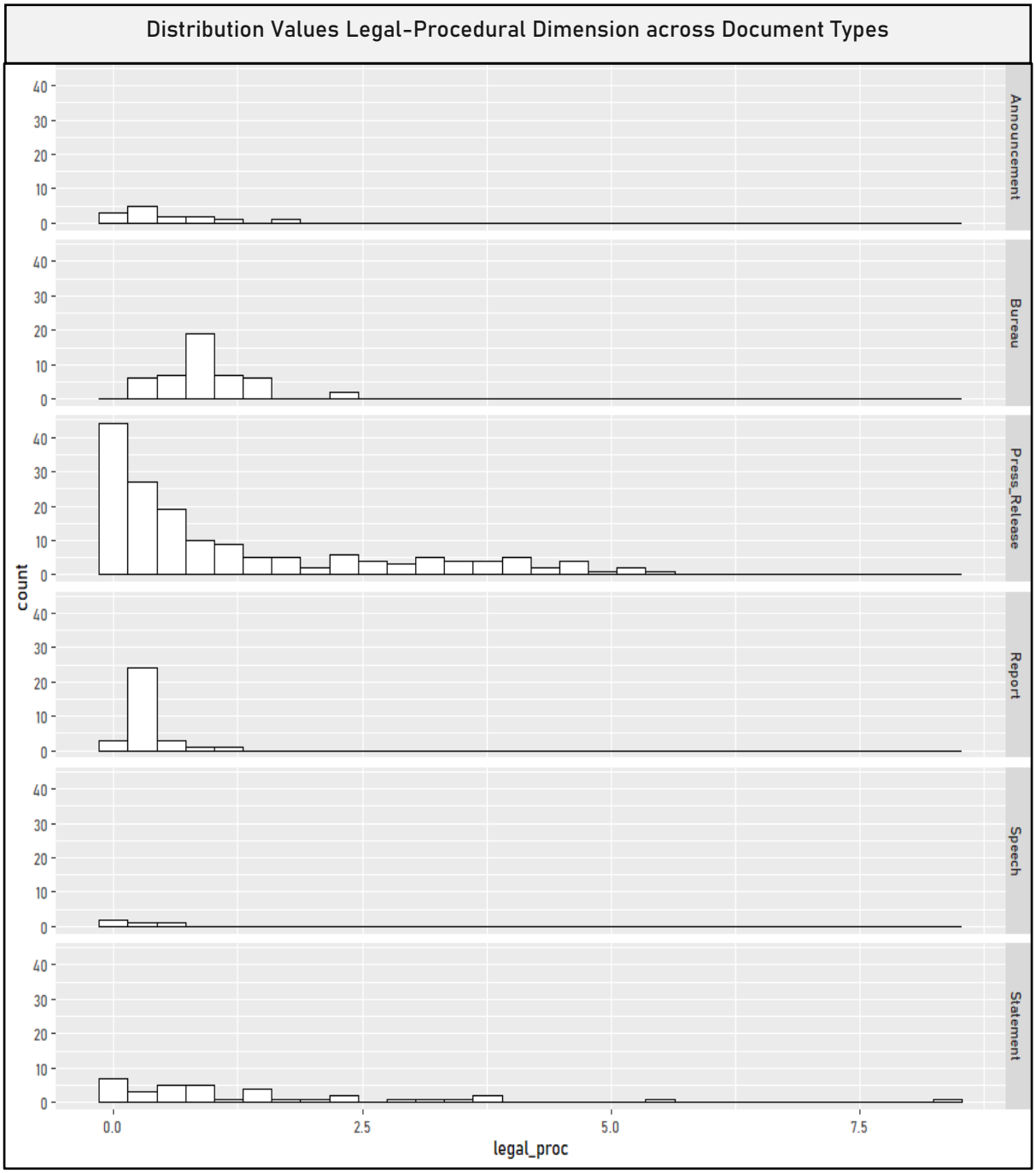
Shapiro-Wilk Normality Test for Log Transformation

Dimension	W	p-value
Technical	0.94694	7.882e-09
Performative	0.98679	0.02283
Legal-Procedural	0.97418	5.63e-05
Moral	0.98668	0.04444

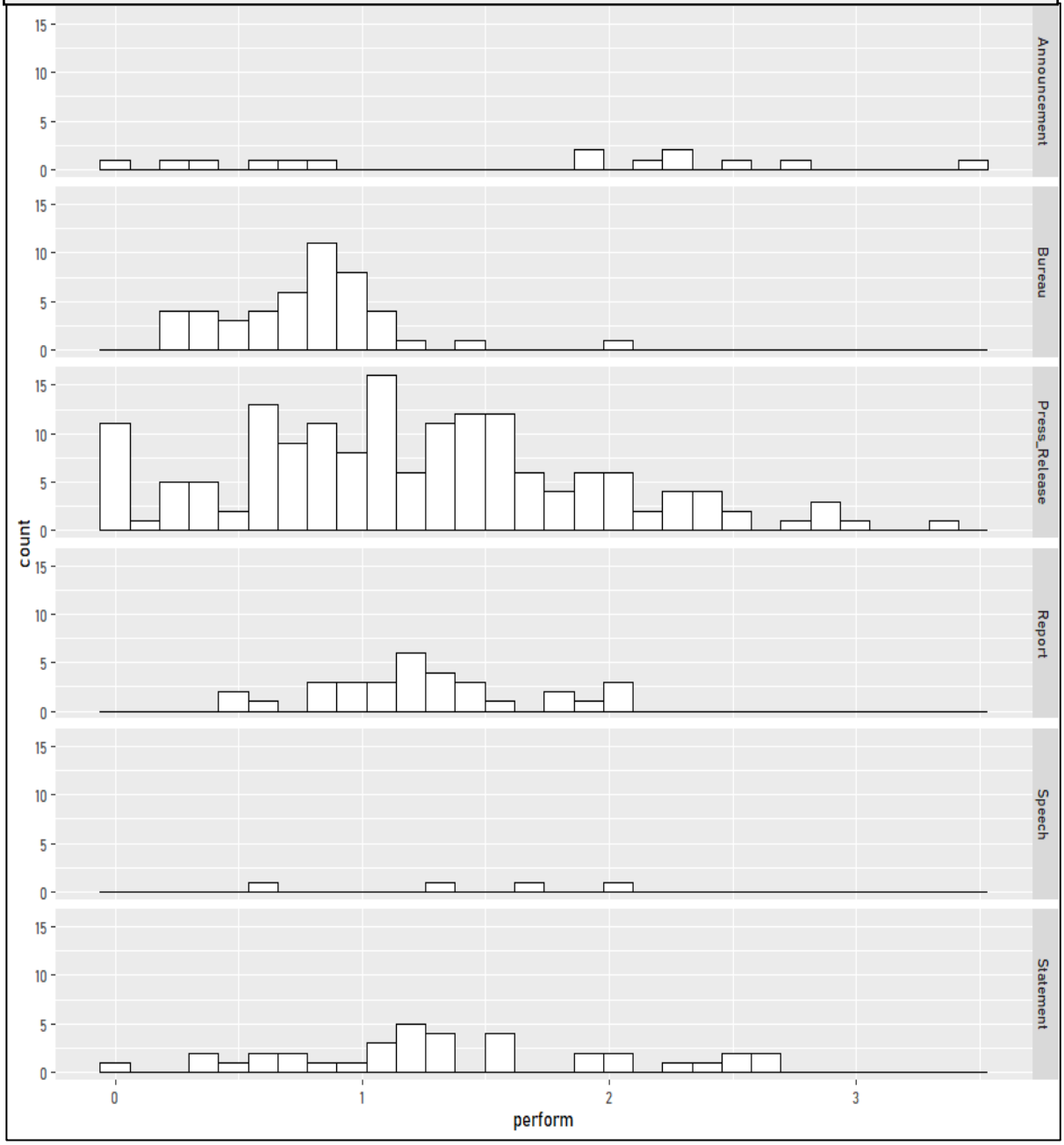
Appendix B

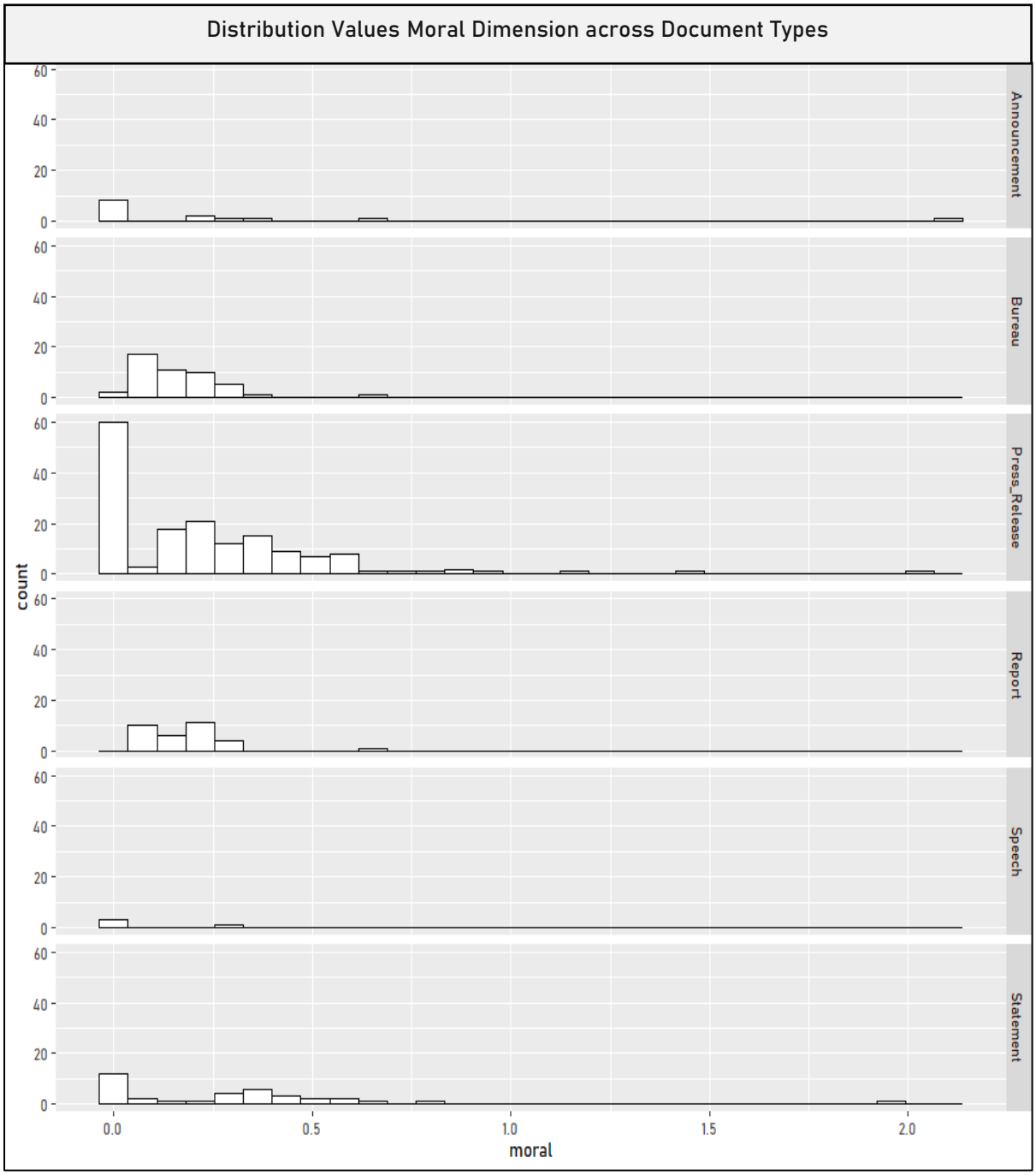
Inspecting Normality of Distribution Outcome Variable by Document Type




Distribution Values Legal-Procedural Dimension across Document Types
count
legal_proc
0.0
2.5
5.0
7.5
0
10
20
30
40
Announcement
Bureau
Press_Release
Report
Speech
Statement

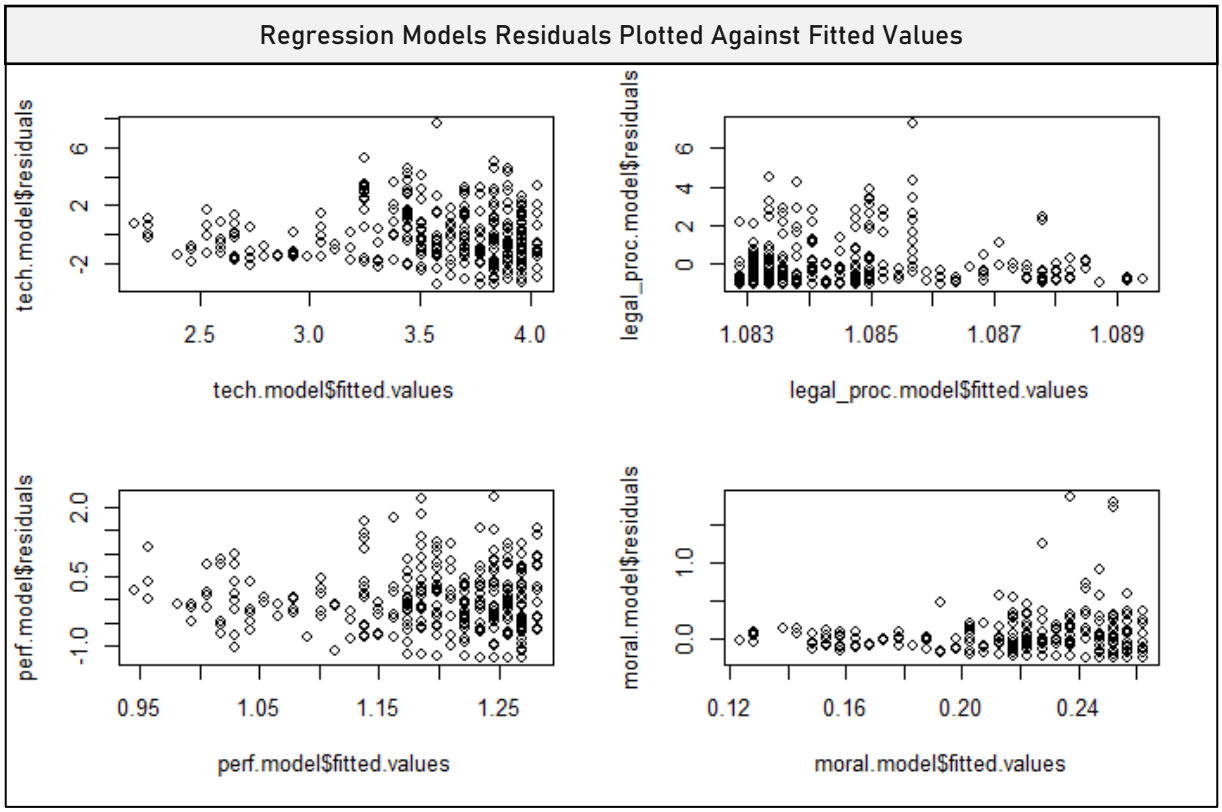
Distribution Values Performative Dimension across Document Types



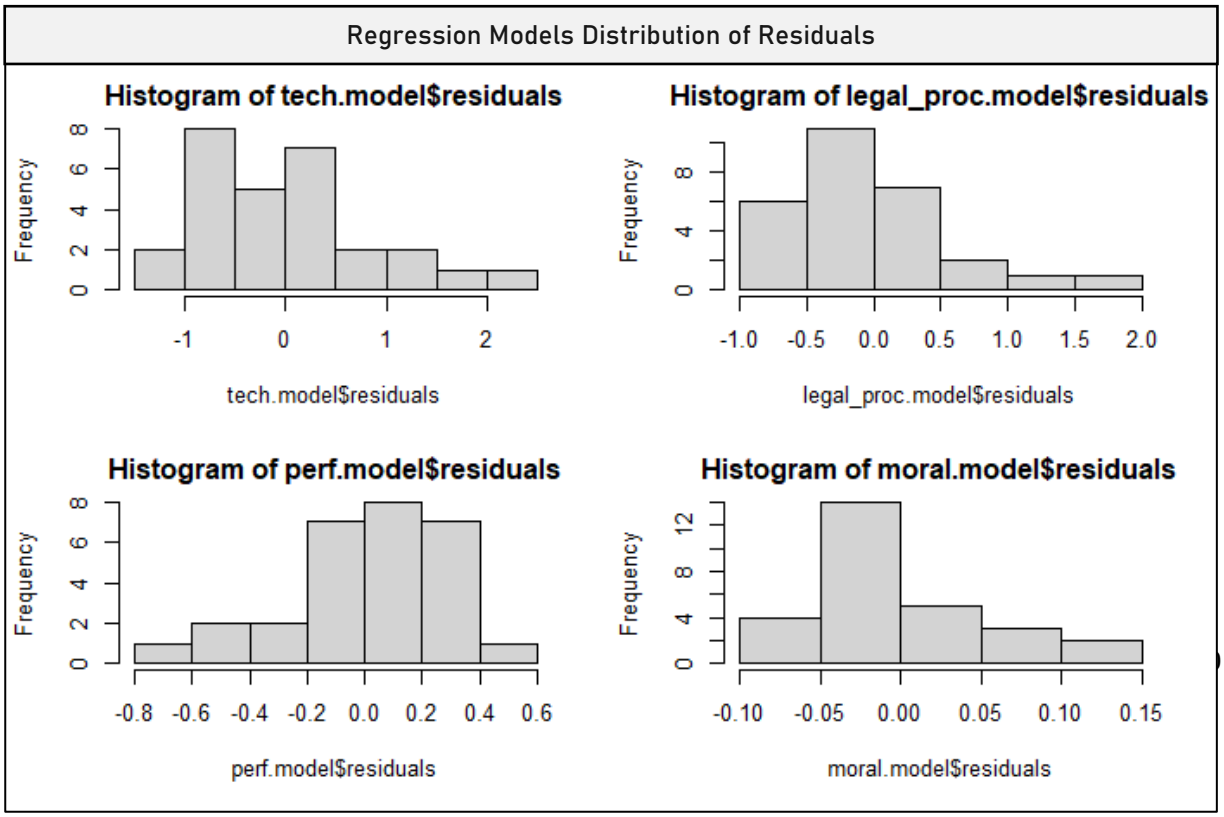

Distribution Values Moral Dimension across Document Types
count
moral
Announcement
Bureau
Press_Release
Report
Speech
Statement
0
20
40
60
0.0
0.5
1.0
1.5
2.0

Appendix C: Regression Assumptions

Homoscedasticity and Linearity: Residuals Plotted against Fitted Values

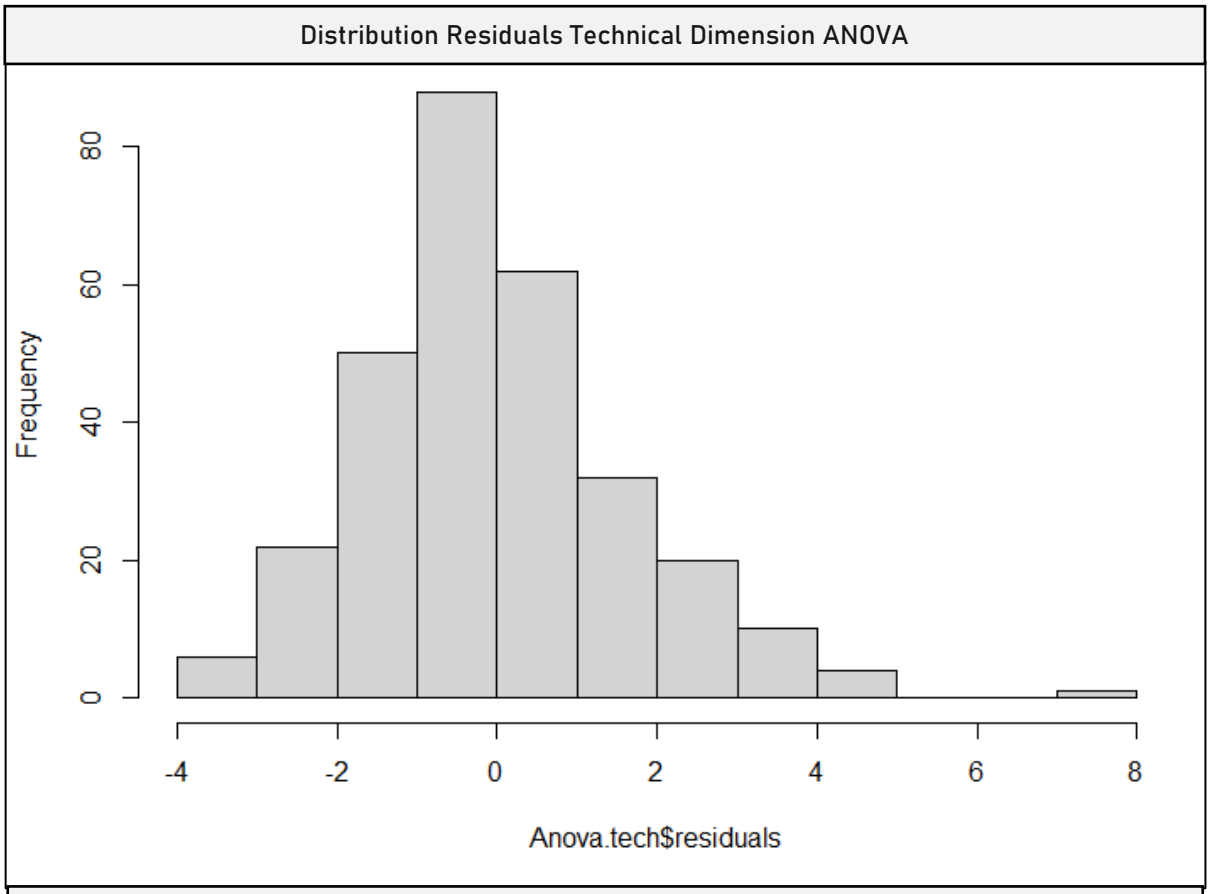


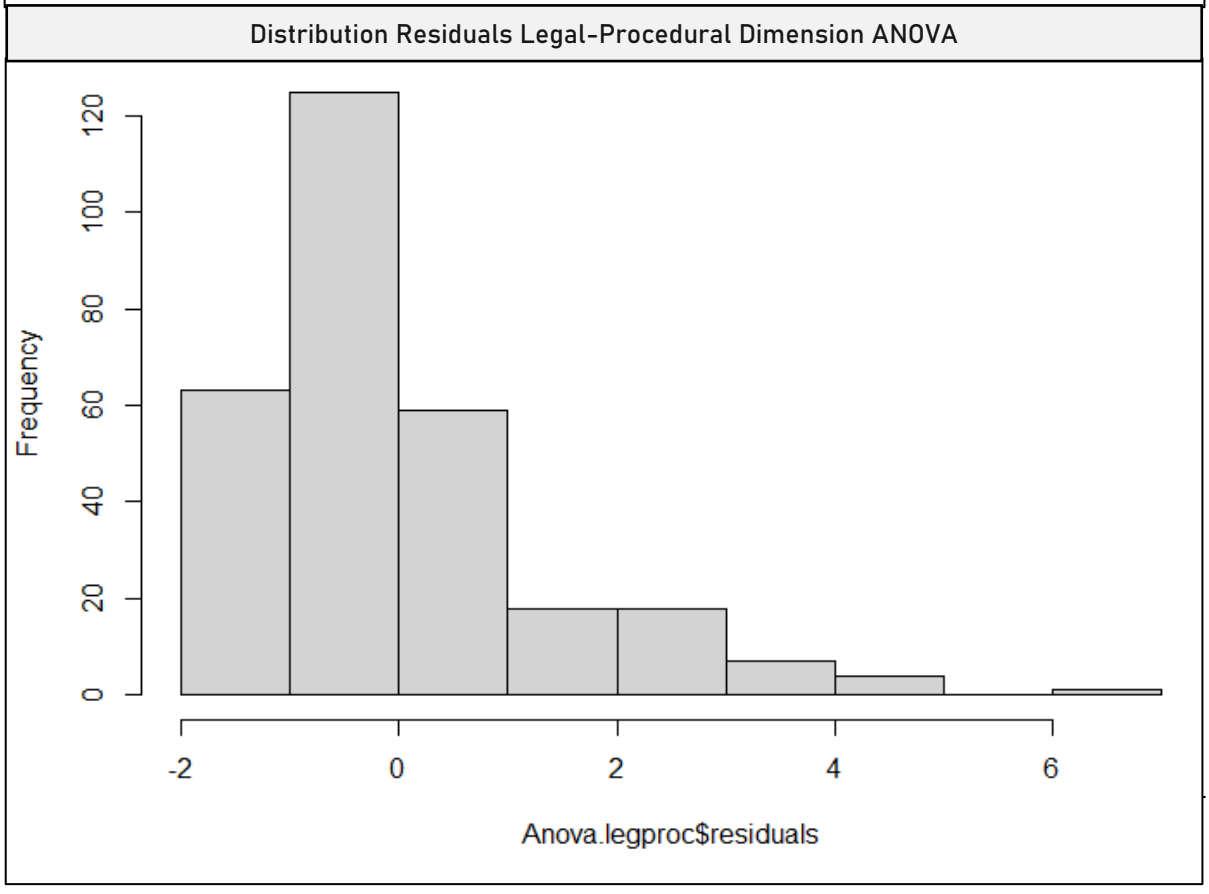
Normality: Distribution of Residuals

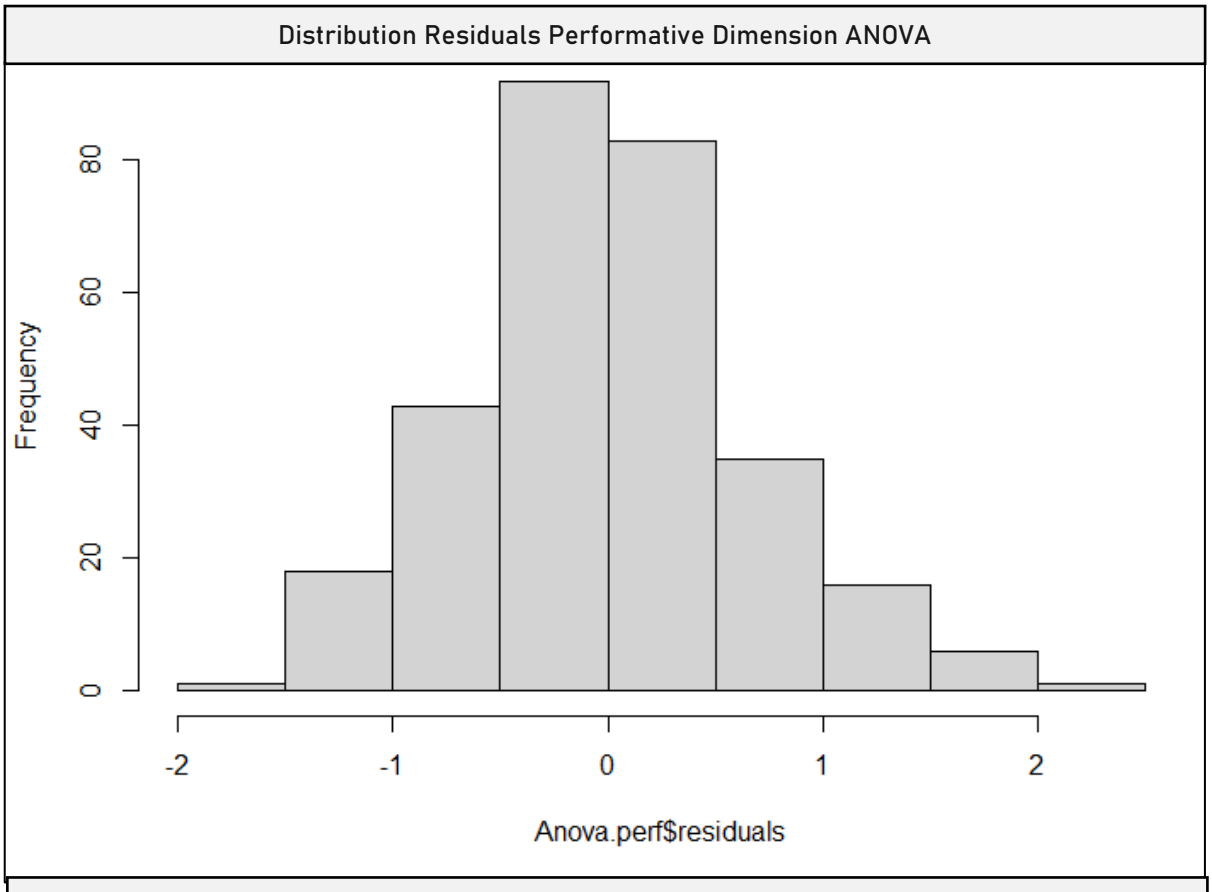


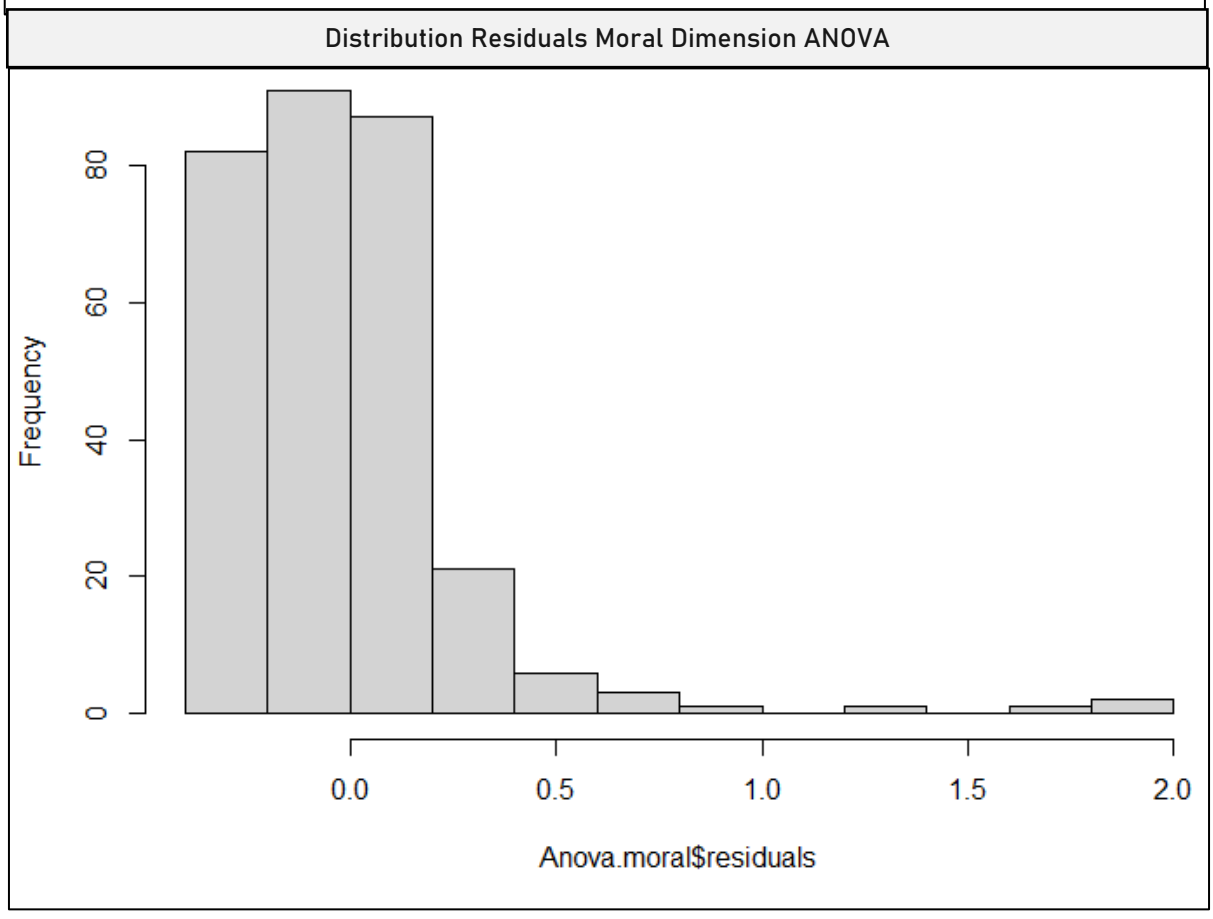
Appendix D: ANOVA Assumptions

Normality: Distribution of Residuals

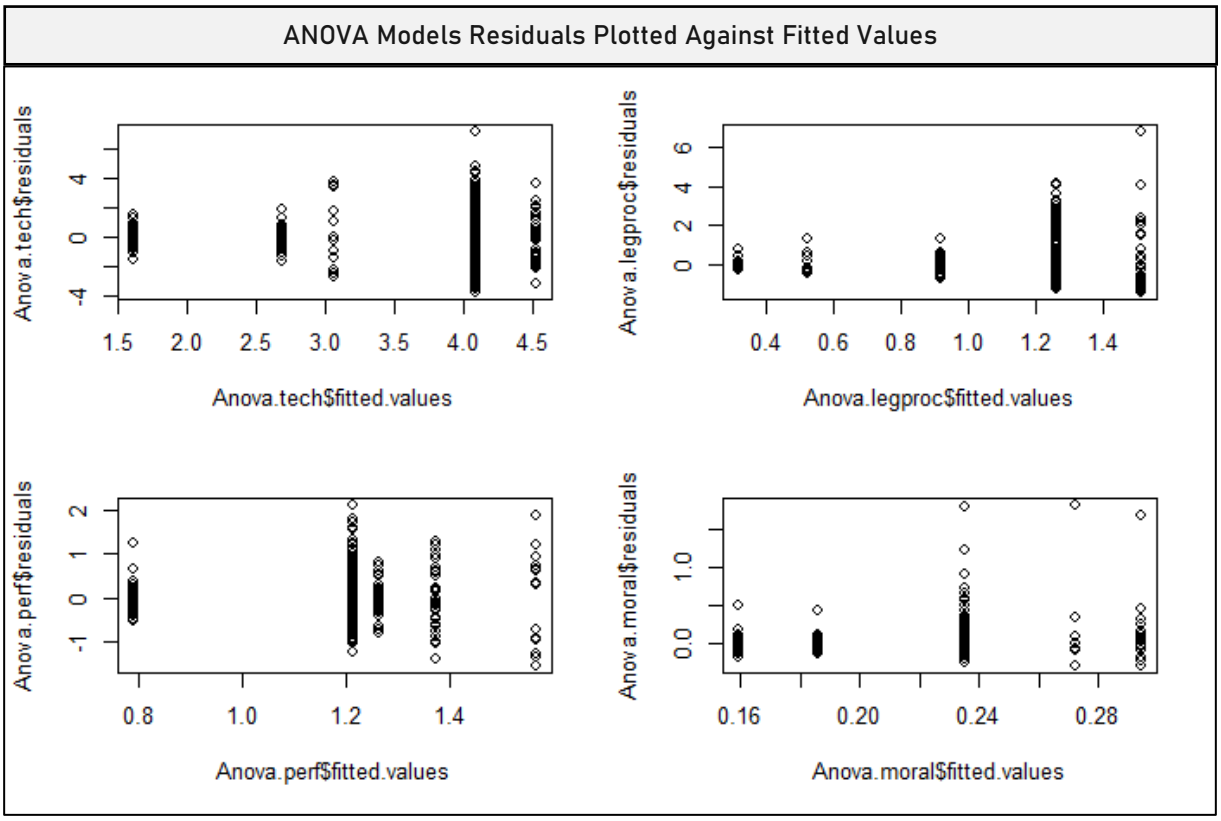





Distribution Residuals Performative Dimension ANOVA
Frequency
0
20
40
60
80
-2
-1
0
1
2
Anova.perf$residuals


Distribution Residuals Moral Dimension ANOVA
Frequency
0
20
40
60
80
0.0
0.5
1.0
1.5
2.0
Anova.moral$residuals

Homoscedasticity: Residuals Plotted Against Fitted Values



Appendix E: R Script

Required Packages

```
#install.packages("Rtools")
#install.packages("rvest")
#install.packages("dplyr")
#install.packages("tidyverse")
#install.packages("stringr")
#install.packages("httr")
#install.packages("readr")
#install.packages("stringi")
#install.packages("purrr")
#install.packages("cli")
#install.packages("readtext")
#install.packages("LDAvis)
#install.packages("quanteda")
#install.packages("quanteda.textstats")
#install.packages("ggplot2")
#install.packages("tidytext")
#install.packages("reshape2")
#install.packages("rstatix")
#install.packages("ggpubr")
#install.packages("viridis")
#install.packages("plotrix")
```

Upload Data Sources into R Environment

Set Working Directory

```
```{r}
setwd("D:/ ")
```
```

Library Useful Packages

```
```{r}
library(rstatix)
library(ggpubr)
library(readtext)
library(httr)
library(tidyverse)
library(stringr)
library(rvest)
library(dplyr)
library(cli)
library(purrr)
library(readr)
```
```

```
library(stringi)
library(pdftools)
library(LDAvis)
library(quanteda)
library(quanteda.textstats)
library(ggplot2)
library(tidytext)
library(servr)
library(reshape2)
library(viridis)
library(plotrix)
```

Extract Bureau Meeting Links

```{r}
link = "https://www.ipcc.ch/documentation/bureau/"
page = read_html(link)
name = page %>% html_nodes(".file+ .file .title") %>% html_text()
date = page %>% html_nodes(".file+ .file .date") %>% html_text()
date = substring(date, 2, )
```

Create Data frame for Months, Days, and Years

```{r}
date            = as.data.frame(date)
date            = separate(date, col = date, into = c("Month","Day","Year"), sep = c(" ", ", "))
date$Month    <- match(date$Month, month.name)
```

Retrieve Bureau Meeting PDFs

```{r}
text_link = page %>% html_nodes("#bureau-document_list-1 a") %>%  html_attr("href")
get_text = function(text_link) {
  text_page = read_html(text_link) %>% html_text()
  return(text_page)
}
setwd("D: /Bureau")
for (url in text_link){ download.file(url, destfile = basename(url), mode = "wb") }
bureau.text <- readtext("D:/Academics/2. Master's/Courses/0. Public Administration/Master Thesis/0. Data Gathering/1. datafiles/Bureau")
type.bureau = "Bureau" #give type
```

Create Dataframe for Text Content of Documents

```{r}
text.corpus <- data.frame(name, date, bureau.text)
text.corpus$Type <- type.bureau
text.corpus$Day  <- gsub(",", "", as.character(text.corpus$Day))
```

```

All other documents were manually retrieved from the IPCC website and archive.

Add Statement Documents
```{r}
text.statement <- readtext("D:/Academics/2. Master's/Courses/0. Public Administration/Master Thesis/0. Data Gathering/1. datafiles/Statement",
                docvarsfrom = "filename",
                dvsep = "-",
                docvarnames = c("Day", "Month", "Year", "Type"))
text.corpus <- merge(text.corpus, text.statement, all.x = TRUE, all.y = TRUE)
```

Add Speech Documents
```{r}
text.speech <- readtext("D:/Academics/2. Master's/Courses/0. Public Administration/Master Thesis/0. Data Gathering/1. datafiles/Speeches",
                docvarsfrom = "filename",
                dvsep = "-",
                docvarnames = c("Year", "Month", "Day", "Type"))
text.corpus <- merge(text.corpus, text.speech, all.x = TRUE, all.y = TRUE)
```

Add Press Releases
```{r}
text.press <- readtext("D:/Academics/2. Master's/Courses/0. Public Administration/Master Thesis/0. Data Gathering/1. datafiles/Press Releases",
                docvarsfrom = "filename",
                dvsep = "-",
                docvarnames = c("Year", "Month", "Day", "Type"))

text.corpus <- merge(text.corpus, text.press, all.x = TRUE, all.y = TRUE)
```

Add Announcements
```{r}
text.announce <- readtext("D:/Academics/2. Master's/Courses/0. Public Administration/Master Thesis/0. Data Gathering/1. datafiles/Announcements",
                docvarsfrom = "filename",
                dvsep = "-",
                docvarnames = c("Year", "Month", "Day", "Type"))

text.corpus <- merge(text.corpus, text.announce, all.x = TRUE, all.y = TRUE)
```

Add Summary for Policymakers
```{r}

```
text.spm <- readtext("D:/Academics/2. Master's/Courses/0. Public Administration/Master Thesis/0. Data Gathering/1. datafiles/SPM",
                docvarsfrom = "filename",
                dvsep = "-",
                docvarnames = c("Year", "Assessment", "Type", "Subtype"))
```

Data Preparation

Removing redundant spaces to ensure that the length matches

```{r}
text.spm$text <- str_squish(text.spm$text)
text.corpus <- merge(text.corpus, text.spm, all.x = TRUE, all.y = TRUE)
text.corpus$text <- gsub("\n", " ", as.character(text.corpus$text))
text.corpus$text <- gsub("\n", " ", text.corpus$text)
text.corpus$text <- gsub("^\\s+", "", text.corpus$text)
text.corpus$text <- gsub("\\s+$", "", text.corpus$text)
text.corpus$text <- gsub("[ |\t]+", " ", text.corpus$text)
text.corpus$text <- gsub("[^\x01-\x7F]", "", text.corpus$text)
text.corpus$text <- gsub("[[:punct:]]", " ", text.corpus$text)
```

Convert Dates into Numeric Values

```{r}
text.corpus$Month <- as.numeric(text.corpus$Month)
text.corpus$Day <- as.numeric(text.corpus$Day)
text.corpus$Year <- as.numeric(text.corpus$Year)
```

Convert Year of Publication to Age of IPCC

```{r}
text.corpus$age <- text.corpus$Year - 1988
```

Testing Accurate Word Counts

The word counts are compared to the word counts within the txt files that were copied and pasted from the webpages. The number used is the place in the document list, ordered from high-low with the names [Year-Month-Day]

Announcement

```{r}
announcement1 <- lengths(strsplit(text.announce$text[1], " "))
announcement6 <- lengths(strsplit(text.announce$text[6], " "))
announcement12 <- lengths(strsplit(text.announce$text[12], " "))
```

Press Release

```{r}
pressrelease1 <- lengths(strsplit(text.press$text[1], " "))
pressrelease6 <- lengths(strsplit(text.press$text[6], " "))
pressrelease10 <- lengths(strsplit(text.press$text[10], " "))
pressrelease20 <- lengths(strsplit(text.press$text[20], " "))
```

Statements
```{r}
statement2 <- lengths(strsplit(text.statement$text[2], " "))
statement25<- lengths(strsplit(text.statement$text[25], " "))
```

Speeches
```{r}
speech1 <- lengths(strsplit(text.speech$text[1], " "))
speech2 <- lengths(strsplit(text.speech$text[2], " "))
```

SPM
```{r}
spm2 <- lengths(strsplit(text.spm$text[2], " "))
spm11 <- lengths(strsplit(text.spm$text[11], " "))
spm17 <- lengths(strsplit(text.spm$text[17], " "))
```

Keyword Analysis

Coding the Dictionary

```{r}
technical <-as.list(c("reliability", "reliable", "test", "tested", "testing","tests",
"analyses","analysis","analysing","assesses", "assess", "assessment","assessing",
"calculate",
            "calculation", "calculates","calculating", "data", "evidence", "examine",
"examiniation", "examining",
            "examines",  "expert", "expertise", "experts", "investigate", "investigates",
"investigating",
            "investigation", "knowledge", "likelihood", "methodology","methods", "model",
"models",
            "modelling", "method", "professional","profession", "qualitative",
"quantify","quantifies", "quantifying", "quantitative",
            "research","researching","rigour", "rigorous","rigor", "robust","robustness",
"science", "scientific", "study", "studies","studying", "technique",
            "technical", "confidence","confident", "fact", "finding", "findings",
            "prize", "projection","projected","projects", "undertainty","uncertain",
"certainty","certain",
            "scenario","scenarios", "understanding"))
```

```
performative <- as.list(c("achieved","achieves", "achievement","achieving","act",
"action","actions", "adopt_decision", "application","assert","assertion", "assertive",
"compliance", "comply","complies","complying", "effective","effectiveness",
              "efficient", "enforce","enforces", "enforcing", "goal", "goals","improving",
"improve","improvement", "improves", "inspect","inspects", "inspection", "KPI",
              "objective", "objectives", "complete","completes", "completing", "comprehensive",
"determine","determinating", "determines", "ensure", "ensures", "ensuring",
              "establish","established", "establishing","exhaustive", "influential", "policy-
relevant","policy-relevance","relevance", "robust", "oblige",
              "outcome","outcomes",  "output", "performance","performing", "restrict",
"result","results",  "success", "target", "targets",
              "deliver"))

legal_procedural <- as.list(c("access to document", "access to information", "appeal",
"appeals","appealing", "conflict of interest","conflicts of interest", "consult","consultation",
"consults", "control standard","control standards", "control system",
                "declaration of interest", "formal", "independent","independence", "internal
control",  "internal operation", "internal system", "judicial", "legal","law", "laws",
"liability","liable", "management standard", "management system", "procedure",
                "procedures", "process","processes", "protocol","protocol", "provisions",
"requirement","requirements", "rule", "rules", "ruling", "guideline", "procedural",
                "guidelines", "logically organized","principle", "principles", "recognize",
"review",
                "terms of reference"))


moral <- as.list(c("committed to","commits to", "common interest", "consumer",
"credibility","credible", "dialogue", "engagement","engaging", "ethical","ethics",
"flexible","flexibility", "good_governance", "honest","honesty",
           "inclusive", "inclusivity", "representativity", "precautionary", "protection",
"safeguarding", "transparent", "trusting", "trusts", "safeguards", "responsibility",
         "integrity", "moral", "openness", "precaution", "protect", "public interest", "respect
for", "safeguard", "societal", "transparency", "trust", "users", "values",
         "confidentiality", "diversity", "gender", "independence", "marginalized",
"representation", "responsible",
         "responsiveness", "sustainability",  "sustainable_development", "vulnerable"))
```

Function for Retrieving Word Counts

```{r}
count_words <- function(document, dictionary){
  count <- sum(str_count(document, fixed(dictionary, ignore_case=TRUE)))
  len <- lengths(strsplit(document, " "))
  return(count/len*100)
}
```

Extracting relative word counts

```{r}
count_words(text.corpus$text, technical)
text.corpus$technical   <- technical_perc <- sapply(text.corpus$text, count_words, technical)
text.corpus$perform     <- perform_perc <- sapply(text.corpus$text, count_words, performative)
text.corpus$legal_proc  <- legal_proc_perc <- sapply(text.corpus$text, count_words, legal_procedural)
text.corpus$moral       <- moral_perc <- sapply(text.corpus$text, count_words, moral)
```

Summary Statistics

```{r}
sumtech   <- summary(text.corpus$technical)
sumleg    <- summary(text.corpus$legal_proc)
sumperf   <- summary(text.corpus$perform)
summor    <- summary(text.corpus$moral)
sumstatistic <- rbind(sumtech, sumleg, sumperf, summor)
write.table(sumstatistic, sep = ";")

std.error(text.corpus$technical)
std.error(text.corpus$legal_proc)
std.error(text.corpus$perform)
std.error(text.corpus$moral)

sd(text.corpus$technical)
sd(text.corpus$legal_proc)
sd(text.corpus$perform)
sd(text.corpus$moral)

```

Aggregating to Yearly Values for each Dimension

```{r}
yeardata <- aggregate(technical ~ Year, text.corpus, mean)
perform_year <- aggregate(perform ~ Year, text.corpus, mean)
legal_proc_year <- aggregate(legal_proc ~ Year, text.corpus, mean)
moral_year <- aggregate(moral ~ Year, text.corpus, mean)

yeardata <- merge(yeardata, perform_year, all.x = TRUE, all.y = TRUE)
yeardata <- merge(yeardata, legal_proc_year, all.x = TRUE, all.y = TRUE)
yeardata <- merge(yeardata, moral_year, all.x = TRUE, all.y = TRUE)
yeardata$age <- yeardata$Year - 1988
yeardata$age.sq <- (yeardata$age)^2
```

```
require(car)
hist(yeardata$technical)
hist(yeardata$legal_proc)
hist(yeardata$perform)
hist(yeardata$moral)
qqPlot(yeardata$technical)
qqPlot(yeardata$legal_proc)
qqPlot(yeardata$perform)
qqPlot(yeardata$moral)
```

Inspect Assumption that Outcome Variables are normally distributed

```{r}
require(car)

hist(text.corpus$technical)     # --> Skewed
qqPlot(text.corpus$technical)

shapiro.test(text.corpus$technical)
shapiro.test(text.corpus$log.tech)

hist(text.corpus$perform)       # --> Skewed
qqPlot(text.corpus$perform)

hist(text.corpus$legal_proc)    # --> Skewed
qqPlot(text.corpus$legal_proc)

hist(text.corpus$moral)         # --> Skewed
qqPlot(text.corpus$moral)

text.corpus$sq.tech <- sqrt(text.corpus$technical)
hist(text.corpus$sq.tech)
qqPlot(text.corpus$sq.tech)
shapiro.test(text.corpus$sq.tech)

text.corpus$sq.perf <- sqrt(text.corpus$perform)
hist(text.corpus$sq.perf)       # --> Skewed
qqPlot(text.corpus$sq.perf)
shapiro.test(text.corpus$sq.perf)

text.corpus$sq.legproc <- sqrt(text.corpus$legal_proc)
hist(text.corpus$sq.legproc)    # --> Skewed
qqPlot(text.corpus$sq.legproc)
shapiro.test(text.corpus$sq.legproc)

text.corpus$sq.moral <- sqrt(text.corpus$moral)
hist(text.corpus$sq.moral)         # --> Skewed
qqPlot(text.corpus$sq.moral)
```

```

Layout Scheme
```{r}
colors <- viridis(4, option = "plasma", begin = 0.2, end = 0.8)
windowsFonts(A = windowsFont("Bahnschrift"))
```

Performing Paired T-Test
```{r}
t.test(text.corpus$technical, text.corpus$legal_proc, paired = TRUE, var.equal = FALSE)
t.test(text.corpus$technical, text.corpus$perform, paired = TRUE, var.equal = FALSE)
t.test(text.corpus$technical, text.corpus$moral, paired = TRUE, var.equal = FALSE)

t.test(text.corpus$legal_proc, text.corpus$perform, paired = TRUE, var.equal = FALSE)
t.test(text.corpus$legal_proc, text.corpus$moral, paired = TRUE, var.equal = FALSE)

t.test(text.corpus$perform, text.corpus$moral, paired = TRUE, var.equal = FALSE)
```

Regression Analysis

Creating Regression Models
```{r}
tech.model       <- lm(technical ~ age, data = text.corpus)
summary(tech.model)
legal_proc.model  <- lm(legal_proc ~ age, data = text.corpus)
summary(legal_proc.model)
moral.model      <- lm(moral ~ age, data = text.corpus)
summary(moral.model)
perf.model <- lm(perform ~ age, data = text.corpus)
summary(perf.model)
```

Testing Assumptions Regression Models
```{r}
par(mfrow = c(2,2))
plot(tech.model$fitted.values, tech.model$residuals)
plot(legal_proc.model$fitted.values, legal_proc.model$residuals)
plot(perf.model$fitted.values, perf.model$residuals)
plot(moral.model$fitted.values, moral.model$residuals)

hist(tech.model$residuals)
hist(legal_proc.model$residuals)
hist(perf.model$residuals)
hist(moral.model$residuals)
par(mfrow = c(1,1))
```
```

```

Recasting of Regression Lines on new Plot

```{r}
age <- seq(from = 0, to = 35, length.out = 1000)
reputation.dim <- seq(from = 0, to = 5, length.out = 1000)
nrep <- data.frame(age, reputation.dim)

techpredCI <- predict(tech.model, newdata = nrep, interval = "confidence", level = 0.95)
legalpredCI <- predict(legal_proc.model, newdata = nrep, interval = "confidence", level = 0.95)
perfpredCI <- predict(perf.model, newdata = nrep, interval = "confidence", level = 0.95)
moralpredCI <- predict(moral.model, newdata = nrep, interval = "confidence", level = 0.95)
```

Making Plot

```{r}
plot(nrep$age, nrep$reputation.dim, main = "Trend in Presence of Reputational Dimensions in IPCC Documentation",
    cex.main = 1.6, xlim = c(5, 35),
    xlab = "Age",
    cex.lab = 1, las=1, ylab = "Presence of Reputational Dimensions (%)",
    col = "white",
    family = "A",
    xaxs="i",yaxs="i")

polygon(x = c(0,35,35,0), y = c(0,0,5,5), col = "#EBEBEB")
grid(nx = NULL, ny = NULL,
    lty = 1,      # Grid line type
    col = "white", # Grid line color
    lwd = 0.5)      # Grid line width

lines(nrep$age, techpredCI[, "fit"], lwd=4, col= colors[1], lty = 2)
lines(nrep$age, legalpredCI[, "fit"], lwd=4, col= colors[2], lty = 2)
lines(nrep$age, perfpredCI[, "fit"], lwd=4, col= colors[3], lty = 2)
lines(nrep$age, moralpredCI[, "fit"], lwd=4, col= colors[4], lty = 2)

points(yeardata$age, yeardata$technical, col= colors[1],pch="+")
points(yeardata$age, yeardata$perform, col= colors[2],pch="x")
points(yeardata$age, yeardata$legal_proc, col= colors[3],pch=20)
points(yeardata$age, yeardata$moral, col= colors[4],pch= 8)

legend("right", inset=c(0,0.6), col = colors,
       fill = colors,
       legend= c("Technical", "Performative", "Legal-Procedural", "Moral"),
       pt.cex = c(1.5,1.5,1.5), cex = 0.7,
      )
```
```

```

## Analysis of SPMs

```{r}
SPMreports  <- subset(text.corpus, text.corpus$Type == "Report")
SPMsubset   <- subset(SPMreports, Subtype!= "Special")

hist(SPMsubset$technical)
hist(SPMsubset$legal_proc)
hist(SPMsubset$perform)
hist(SPMsubset$moral)

colnames(SPMsubset)[13:16] <- c("Technical Dimension", "Performative Dimension", "Legal-Procedural Dimension", "Moral Dimension")

SPMmelt     <- melt(SPMsubset, id.vars = c("age", "Subtype"),
                measure.vars = c("Technical Dimension", "Performative Dimension", "Legal-Procedural Dimension", "Moral Dimension"),
                value.name = "Reputational_Score", na.rm = FALSE)

ggplot(data=SPMmelt,
       aes(x=age, y= Reputational_Score, colour=Subtype)) +
       geom_line(size=2, linejoin = "round") + facet_wrap( ~variable) +
       scale_color_viridis(option = "plasma", discrete = TRUE, begin = 0.2, end = 0.8) +
       theme(text = element_text(family = "A"))
```

Document Counts over Time

Analysis of Document Types

```{r}
typedata      <- aggregate(technical ~ Type, text.corpus, mean)
typedata$Dimension <- "Technical"
perf_type     <- aggregate(perform ~Type, text.corpus, mean)
perf_type$Dimension <- "Performative"
legal_type    <- aggregate(legal_proc ~ Type, text.corpus, mean)
legal_type$Dimension <- "Legal Procedural"
moral_type    <- aggregate(moral ~ Type, text.corpus, mean)
moral_type$Dimension <- "Moral"

typedata <- merge(typedata, perf_type, all.x = TRUE, all.y = TRUE)
typedata <- merge(typedata, legal_type, all.x = TRUE, all.y = TRUE)
typedata <- merge(typedata, moral_type, all.x = TRUE, all.y = TRUE)

melttypedata <- melt(typedata, id.vars = c("Type", "Dimension"),value.name = "Reputational_Score", na.rm = TRUE)
```
```

```
ggplot(melttypedata, aes(x = Type,y = Reputational_Score)) +
  geom_bar(aes(fill = Dimension),stat = "identity",position = "dodge") +
  scale_fill_viridis(option = "plasma", discrete = TRUE, begin = 0.2, end = 0.8) +
    theme(text = element_text(family = "A")
          )
```

Counts over time

```{r}
ggplot(text.corpus %>% count(Year, Type),
       aes(Year, n, fill= Type)) +
  geom_bar(stat = "identity") +
  scale_fill_viridis(option = "plasma", discrete = TRUE, begin = 0.2, end = 0.8) +
  theme(text = element_text(family = "A"))
```

Make Boxplots for Document Types

```{r}
long.corpus <- melt(text.corpus, id.vars = c("Type", "Year"), measure.vars = c("technical",
"perform", "legal_proc", "moral"), value.name = "Reputational_Score", na.rm = TRUE)

stat.test <- long.corpus %>%
  group_by(variable) %>%
  t_test(Reputational_Score ~ Type) %>%
  adjust_pvalue(method = "BH") %>%
  add_significance()
stat.test

plot(stat.test)
levels(long.corpus$variable) <- c("Technical Dimension", "Performative Dimension", "Legal-
Procedural Dimension", "Moral Dimension")

statplot <- ggboxplot(
  long.corpus, x = "Type", y = "Reputational_Score",
  fill = "Type", palette = "npg", legend = "none",
  ggtheme = theme_pubr(border = TRUE)) +
  facet_wrap(~variable) +
  scale_fill_viridis(option = "plasma", discrete = TRUE, begin = 0.2,
  end = 0.8) +
  theme(text = element_text(family = "A"))
statplot
```

Perform Anova and Test Assumptions

```{r}
```

```
text.corpus$Type.fac <- as.factor(text.corpus$Type)
text.corpus <- text.corpus[!text.corpus$Type == "Speech", ]

Anova.tech <- aov(technical ~Type.fac, data = text.corpus)
plot(Anova.tech)

Anova.legproc <- aov(legal_proc ~Type.fac, data = text.corpus)
plot(Anova.legproc)

Anova.perf <- aov(perform ~Type.fac, data = text.corpus)
plot(Anova.perf)

Anova.moral <- aov(moral ~Type.fac, data = text.corpus)
plot(Anova.moral)

summary(Anova.tech)
summary(Anova.legproc)
summary(Anova.perf)
summary(Anova.moral)

anovas <- rbind(c(Anova.tech, Anova.legproc, Anova.perf, Anova.moral), use.names = TRUE)

hist(Anova.tech$residuals)
hist(Anova.perf$residuals)
hist(Anova.legproc$residuals)
hist(Anova.moral$residuals)

par(mfrow = c(2,2))
plot(Anova.tech$fitted.values, Anova.tech$residuals)
plot(Anova.legproc$fitted.values, Anova.legproc$residuals)
plot(Anova.perf$fitted.values, Anova.perf$residuals)
plot(Anova.moral$fitted.values, Anova.moral$residuals)

summary(Anova.tech)

ggplot(text.corpus, aes(x = technical)) +
  geom_histogram(fill = "white", colour = "black") +
  facet_grid(Type.fac ~ .)

ggplot(text.corpus, aes(x = perform)) +
  geom_histogram(fill = "white", colour = "black") +
  facet_grid(Type.fac ~ .)

ggplot(text.corpus, aes(x = legal_proc)) +
  geom_histogram(fill = "white", colour = "black") +
  facet_grid(Type.fac ~ .)

ggplot(text.corpus, aes(x = moral)) +
```

```
  geom_histogram(fill = "white", colour = "black") +
  facet_grid(Type.fac ~ .)
```

Appendix F: Consent Form

Interview Consent Form

Research Project Title: Thesis Project for the completion of the Master's Programme "Public Administration: Public Management and Leadership"

Research Investigator: Sven Niekel

Research Organization: under auspices of Leiden University

Research Participants name: [Participant Name]

The interview will take 60-75 minutes. We don't anticipate that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

Thank you for agreeing to be interviewed as part of the above research project. Ethical procedures for academic research require that interviewees *explicitly agree to being interviewed and how the information contained in their interview will be used*. This consent form is necessary for me to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Would you therefore sign this form and check the boxes after reading its content to certify that you approve the following:

- The interview will be *recorded* and a *transcript* will be produced. Both are processed through a secure Teams Channel belonging to Leiden University.
- In the case that you agree to the recording and transcript, you can ask to be sent the transcript and given the opportunity to correct any factual errors.
- The transcript of the interview will be analysed by Sven Niekel as research investigator.
- Access to the interview transcript will be limited to Sven Niekel, and possibly by his thesis supervisor Dr. Johan Christensen.
- Any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymized upon request (See checkboxes). Should you prefer anonymity, care will be taken to ensure that other information in the interview that could identify yourself is not revealed.
- The actual recording will be Deleted.
- Any variation of the conditions above will only occur with your further explicit approval

Quotation Agreement

Fill in here to what extent you wish your data to be anonymized. I also understand that my words as an expert may be used to support claims. With regards to beingquoted, please initial next to any of the statements that you agree with:

	I wish to review the notes, transcripts, or other data collected during the research pertaining to my participation.
	I agree to be quoted directly by name.
	I agree to be quoted indirectly. This could mean by my occupation or nationality (if marked, I will contact you on the appropriate framing of your occupation). - Relevant Characteristics for the thesis to use in quotation are: Working Group, WMO Region, Assessment Period of participation.
	I agree to be quoted directly if my name is not published and a made-up name (pseudonym) is used.
	I agree that the researchers may publish documents that contain quotations by me under the above specified condition of anonymity.

All or part of the content of your interview may be used;

- In academic papers, policy papers or news articles
- On our website and in other media that we may produce such as spoken presentations
- In an archive of the project as noted above

By signing this form I agree that;

1. I am voluntarily taking part in this project. I understand that I don't have to take part, and I can stop the interview at any time;
2. The transcribed interview or extracts from it may be used as described above;
3. I don't expect to receive any benefit or payment for my participation;
4. I can request a copy of the transcript of my interview and may make edits if I feel it necessary to ensure the effectiveness of any agreement made about

confidentiality;

5. I have been able to ask any questions I might have, and I understand that I am free to contact the researcher with any questions I may have in the future.

_____
Printed Name

_____ _____
Participants Signature Date

_____ _____
Researchers Signature Date

Contact Information

If you have any further questions or concerns about this study, please contact:

- Name of researcher: Sven Niekel
- Full address: [redacted]
- Tel: +316 83 44 59 47
- E-mail: svenniekel@gmail.com or s2959909@vuw.leidenuniv.nl

Should the researcher not respond to pressing requests for a continued amount of time, you may contact his supervisor. Please only use this as a last resort, or in case of an emergency:

- Name of researcher: Dr. Johan Christensen
- E-mail: j.christensen@fgga.leidenuniv.nl