Crisis Communication in the Fourth Age of Political Communication. Three Essays on Social Media Communication and Computational Text Analysis.

By

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Abstract

Social media has taken on a pivotal role in politics, creating a hybrid media system and introducing the fourth age of political communication. It has been heralded as the solution to all democratic deficits and has presented itself with increasingly destructive impacts on democracy. However, its impact on political communication, particularly during crises – times of uncertainty, threat, and heightened political competition – remains unclear. This dissertation contributes to this gap and examines the role of social media in political crisis communication through three interconnected studies, drawing on computational text analysis and Facebook data throughout all chapters.

Focusing on the complex interplay between political communication, crisis communication, citizen interaction, and social media ecosystems, I investigate (1) patterns of government communication regarding environmental issues and how citizens engage with them; (2) how political parties adjust their issue agendas following unexpected crises across communication channels; and (3) how media reporting shapes citizens' blame attribution in multilevel governance systems.

Using cluster analysis for the first study, I identify three distinct government communication patterns: Formal Institutional Communication, Strategic Policy Advocacy, and Symbolic Leadership. The patterns significantly influence user engagement, with symbolic and action-oriented content generating more positive public engagement than informational posts.

For the second empirical chapter, following German parties' discourse surrounding Russia's full-scale invasion of Ukraine, I demonstrate that while crises generally increase parties' agenda diversity in political communication, this effect varies significantly by communication channel and party status: parliamentary speeches show uniform increases in agenda diversity for both governing and opposition parties, while on Facebook, opposition parties expand their issue agendas significantly more than governing parties.

Finally, analysing the 2021 Ahrtal floods in Germany, the third study applies blame attribution classification through LLM few-shot prompting. It reveals that prior media blame attribution strongly influences citizens' responsibility attributions. Additionally, users shift their blame targets in alignment with media reporting over time, which shows different effects across government levels.

In combination, these findings highlight social media's crucial role in contemporary political communication, particularly during and after crises. In addition, the dissertation reveals a fundamental tension between social media architecture and democratic goals across each study. It raises crucial questions about how government communication can be effective on online platforms, the importance of quality journalism and digital literacy initiatives, and social media's potential to realise democracy's epistemic potential.

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Chapter 1 Introduction

A word after a word after a word is power.

Margaret Atwood

Words are events, they do things, change things. They transform both speaker and hearer; they feed energy back and forth and amplify it. They feed understanding or emotion back and forth and amplify it.

Ursula K. Le Guin

Since the emergence of digital technologies, social media platforms have taken on a pivotal role in politics. They have reshaped key aspects of democratic processes, from foreign interference and campaign strategies (Bossetta, 2018; Larsson, 2016; Magin et al., 2017; Ohlin & Hollis, 2021; Stier et al., 2018), to the connection between political elites and citizens (Klasnes, 2016), and how citizens access news to gain political knowledge (Newman et al., 2024). According to Blumler (2016), the specific social and political consequences of these instantaneous communication channels with global reach have introduced the 'fourth age of political communication'. Instead of coherence and uniformity, communication is now characterised by more

complex, diverse, and competing dynamics. In a similar manner, Chadwick (2017) argues that digital communication ecosystems have created a hybrid media system influenced by older and newer media logics, which have reshaped the power relations between political actors, the media, and the public.

Initially heralded as tools to address democratic deficits, these new social media platforms and their specific media logic were expected to revitalise public trust in political institutions by fostering open government, increasing transparency, public engagement, and confidence in democratic processes (Song & Lee, 2016; Torcal, 2014; Warren et al., 2014). The platforms seemed to offer the closest to what Habermas (1990) envisioned as a public sphere. However, in recent years, we have seen increasingly destructive uses of social media that undermine democratic processes through disinformation, polarisation, and political manipulation (Sunstein, 2018; Tucker et al., 2017). Rather than creating an inclusive deliberative forum, social media provokes deep concerns about the fragmentation of the public sphere (Habermas, 2023) and the conceptual limits of democracy (Ziliotti et al., 2023).

Of course, new communication technologies are not unique, and their effect on politics and democracy is not new either. For example, television has drastically changed the way parties campaign and how citizens access information, initiating a great deal of research on this topic (Blumler, 1970; Iyengar, 1991). This reshaped political communication in various ways, such as the intensified professionalisation of communication and how people receive politics, resulting in what Blumler and Kavanagh (1999) called the 'third age of political communication'. However, no previous technological development has affected political life and democratic processes to such a degree as social media platforms; from Facebook and Instagram to X (formerly Twitter) and TikTok. Today, we cannot talk any more about electoral campaigns without mentioning social media, micro-targeting, bots, and trolls. We cannot talk about crisis management without considering the fast pace of social media messages and the landslides of online (mis-)information. And we cannot talk about political participation without taking into account digital activism and the role of algorithms in shaping civic engagement, from viral protests to hashtag movements that influence political discourse and policymaking. In short, social media is woven through all aspects of political life, interconnected with questions of power, resources,

and access.

Social media has also reshaped how crises affect communication. In times of uncertainty and threat, citizens are more likely to access information on social media than legacy media due to its fast pace and real-time information (Newman et al., 2024; Van Aelst, 2021). Online platforms also provide new opportunities to engage with crisis management and to disseminate information, especially to vulnerable communities (Chatfield & Reddick, 2018; Kahne & Bowyer, 2018; Strömbäck & Kiousis, 2019). Platforms such as Facebook or X have also created new challenges for political learning, such as distinguishing between factually correct information on crises and mis- or disinformation (Li, 2020; Tucker et al., 2017). Analysing how and the extent to which crises disrupt communication processes on social media is crucial to understanding how social media transforms fundamental democratic processes and political concepts.

This dissertation places social media at the forefront of political communication research. It is positioned at the intersection of political (crisis) communication, social media research, and computational text analysis. The dissertation consists of three distinct empirical papers, hereafter referred to as chapters, and addresses established theoretical frameworks and questions of political science research in the context of social media ecosystems. More precisely, I mostly use Facebook data to test how governments communicate environmental topics (Chapter 2), how crises affect parties' issue attention (Chapter 3), and how media reporting influences citizens' blame attribution (Chapter 4). Moreover, the dissertation applies novel techniques of computational text analysis such as bidirectional encoder representations from transformers (BERT) (Chapter 2 and 3) or localised Large Language Models (LLMs) (Chapter 4).

1.1 The Pivotal Role of Social Media in Political Crisis Management

Social media serves a crucial function within crisis contexts. Extraordinary events, including natural disasters and terrorist attacks, generate sudden and unpredictable demands for timely information amongst both governmental bodies and the citizenry. From a governmental per-

spective, establishing a robust and transparent social media strategy, such as delivering high-quality information through official accounts and effectively reaching intended audiences via online messaging, should constitute a fundamental aspect of crisis management protocol (Chatfield & Reddick, 2018). In contrast to traditional media formats such as newspapers, social media offers the significant advantage of rapid dissemination, reaching audiences even in geographically isolated or inaccessible regions. With social media, governments can thus provide time-sensitive information and services instantaneously to affected communities (Chatfield & Reddick, 2018). Citizens not only value such fast and easy access to information, but they can also depend on it during crises.

Beyond information provision for citizens, social media also fulfils a vital function in monitoring and managing citizens' reactions throughout and after crises. Governments must possess the capacity to prevent outbreaks of panic and fear during emergencies. Research demonstrates that clear social media communication on crisis management can effectively mitigate public anxiety. One example is the dissemination of information regarding coordinated European countermeasures during the COVID-19 pandemic in Italy (Lerouge et al., 2023). However, there exists a surprising lack of systematic comparative studies addressing how governments actually communicate on social media both during crises and in normal times.

A third function of social media for political actors is its role as an efficient instrument for co-production during crisis scenarios. Whilst engagement mechanisms such as interactions through comments or tweets remain an under-utilised feature of governmental accounts, evidence suggests that collaborative approaches can yield improved policy outcomes (DePaula et al., 2018; Linders, 2012; Yang & Pandey, 2011). During crises, such collaboration may emerge through citizen networks, gaining significance through the redistribution of governmental information and the forwarding of critical public services to affected online communities (Chatfield & Reddick, 2018). Chapter 2 contributes to these functions of social media by examining patterns of communication on environmental issues as well as the climate crisis and how citizens engage with them.

Citizens additionally utilise social media platforms for political learning and engagement with political causes. These platforms constitute significant tools for various forms of political

action, including protests, and function as mediating mechanisms by facilitating the collective expression of public opinion (Valenzuela, 2013). Within crisis-related contexts, this suggests that social media platforms can enable subsequent citizen protest activities, supporting public accountability processes regarding policy failures or crisis mismanagement, as addressed in Chapter 4.

Lastly, political parties have likewise increasingly acknowledged social media's potential for electoral advantage, but also for maintaining their presence within today's framework of 'permanent campaigning' (Blumenthal, 1980). Partisan adoption of social media communication strategies, particularly on platforms such as Facebook, emerged prominently during Barack Obama's 2008 United States presidential campaign (Klasnes, 2016; Vergeer, 2013). Whilst engagement metrics on social media, such as comments and likes, do not necessarily translate directly into electoral outcomes, they nevertheless contribute substantially to discourse formation and result in consequences that extend beyond the digital sphere (Feezell, 2018; Peeters et al., 2019; Popa et al., 2020). Given the emergence of multiple political agendas operating concurrently (Ivanusch, 2025) and a potentially fragmented public sphere (Habermas, 2023), comprehending how crisis situations influence parties' communication strategies across online and offline channels becomes imperative for understanding their impacts upon audiences. Chapter 3 addresses these questions.

1.2 What is a Crisis?

Research on crises is accompanied by a striking diversity of definitions, types, and examples. Conceptualisations vary across disciplines and are marked by significant differences and exceptions. While "there is no one, universally accepted definition of crisis" (Coombs, 2010, p. 18), certain recurring characteristics include high levels of threat, uncertainty, and urgency in decision-making (Boin et al., 2017). At the same time, there also exists an understanding that we live in times of an increasingly concomitant presence of multiple crises or permanent crises (Henig & Knight, 2023; Voltolini et al., 2020).

A commonly held understanding of crises refers to events that arise suddenly and without

warning, such as natural disasters. These instances constitute an 'alarmed discovery' (Downs, 1972), creating a window of opportunity for political actors (Kingdon & Stano, 1984). In this sense, crises are rare, unexpected events, often called 'focusing events' (Alexandrova, 2015; Birkland, 1998), that serve as turning points with significant political ramifications and often result in unexpected outcomes (Birkland, 2006).

At the same time, crises are not always momentary disruptions; some persist for months or even years. These 'long-shadow crises' ('t Hart & Boin, 2001) produce lasting repercussions and affect victims and politics well beyond the initial event, shaping political dynamics for years to come. Prominent examples include 9/11, Hurricane Katrina, and the Fukushima disaster. Conversely, not all crises emerge suddenly; some develop gradually over time. These 'creeping crises' or 'slow-burning crises' (Mcconnell, 2003), such as the climate crisis, unfold incrementally but ultimately demand attention and response.

Although this latter conceptualisation is often met with scepticism, I align with McConnell (2020) in arguing that crises manifest in multiple forms, each characterised by complexity and profound societal and political implications. Crises are inherently political: how an event is defined, whether as a sudden rupture or a gradual development, shapes its interpretation and articulation (Boin et al., 2017). Crises can be used to suppress dissent, influence governance, drive political change, or be exploited for strategic advantage (Boin et al., 2009; McConnell, 2020). They bring attention to issues or policies that normally remain in the background or have been ignored (Baumgartner et al., 2009; Birkland, 2006).

This dissertation mostly focuses on how crises create opportunities for strategic advantages and shape dominant narratives. I am not addressing how political actors directly respond to crisis events. Response strategies such as those detailed by the Situational Crisis Communication Theory (SCCT) represent an important part of the picture when discussing how organisations or actors decide to address a crisis. Well-known examples include denial strategies, such as dismissing the existence of a crisis, or rebuilding strategies, which involve issuing apologies or compensation to victims (Coombs, 2023). Instead, I focus on how crises generally affect and disrupt actors' communication, whether by providing a window of opportunity to increase the issues they are addressing, to provide information for citizens, or to focus on symbolic

communication, and how these choices of communication affect citizens.

In the empirical chapters of this dissertation, I examine two sudden crises with long-term consequences, though one might argue that early warning signs were present in both cases: the full-scale Russian invasion of Ukraine (Chapter 3) and the 2021 floods in Germany (Chapter 4). Chapter 2, however, addresses a creeping crisis, the climate crisis.

1.3 Theoretical Focus

This dissertation positions itself within several theoretical frameworks that have shaped the understanding of political communication. The first empirical chapter draws on research on communication, public administration, and digital governance and presents the most exploratory analysis of this dissertation. Building on this body of literature, I develop a conceptual model of how social media communication is informed by the interaction of three major logics: the logic of platform, the logic of issue, and the logic of actor (visualised in Figure 2.1). I highlight that communication outputs such as Facebook posts are defined by a nuanced interaction of factors stemming from those logics. This framework relies on previous notable work on government communication (DePaula et al., 2018; Mergel & Bretschneider, 2013), but also on the theorisation of a hybrid media system and how new communication technologies have reshaped politics (Chadwick, 2017).

Chapter 3 builds upon agenda-setting theory (McCombs & Shaw, 1972), examining how crises can affect parties' agenda diversity across communication channels. My research extends previous findings by highlighting the existence of multiple parallel working agendas that are also affected differently by disruptions. Digital platforms have introduced new dynamics that diversify opportunities for direct communication between political actors and citizens, providing greater flexibility in messaging and new opportunities that are exploited to a different degree (Peeters et al., 2019; Popa et al., 2020). Relatedly, priming effects also play an important role in this study as well as the following chapter. Issue salience by media organisations or parties influences how the public evaluates events or policy issues (Iyengar & Kinder, 2010; Walgrave et al., 2009). This chapter addresses how crises affect parties' agenda diversity on

social media and in their offline communication.

Furthermore, the dissertation engages with attribution theory in Chapter 4, particularly in the way it relates to political responsibility and accountability. It extends previous studies on multilevel governance systems (Arceneaux, 2006; Cutler, 2004; Powell & Whitten, 1993) to questions of attribution formulation on social media. I also rely on the body of research on motivated reasoning and political learning (Chaffee & Kanihan, 1997; Kunda, 1987, 1990). More precisely, this chapter focuses on how media reporting can provide heuristics for citizens on social media, highlighting processes of political learning within the social media ecosystem.

Throughout the dissertation, I draw on crisis communication literature, recognising that crises serve as critical junctures in political competition with strong agenda-setting effects (Alink et al., 2001; Boin et al., 2009), and influence accountability processes (Achen & Bartels, 2016; Key, 1966). During these periods, political actors engage in what can be termed 'meaning-making contests', strategically shaping how crises are interpreted (Cmeciu & Coman, 2018; Procopio & Procopio, 2007). Incorporating this literature allows for an analysis of how political actors and citizens navigate challenges across communication platforms, shedding light on patterns of agenda-setting, responsiveness, and political strategy during uncertain times.

The role of social media and its impact on political communication represents a clear commonality running through all chapters. The advent of social media has revolutionised how political actors can engage with the public, offering unprecedented opportunities for direct communication and engagement with constituents. Although social media does not necessarily present a strand of research itself, I engage with literature that addresses how online ecosystems have transformed political communication across various disciplines. I particularly analyse social media through the lens of public relations, communication science, and political science. This dissertation aims to bring attention to how social media has affected central aspects of democratic political processes and potentially provide an idea for research or policy questions on how to continue with an ever-evolving online environment.

Lastly, my research is also situated within broader debates about democratic processes in the digital age. As various scholars such as Habermas (2023) and Ziliotti et al. (2023) have

noted, social media has introduced both new opportunities for democratic engagement and deliberation, as well as unprecedented democratic and ethical challenges. With this dissertation, I hope to contribute to these discussions by addressing how specific elements of democratic processes, such as government communication, parties' agenda diversity, or citizens' engagement and political learning, function in a social media ecosystem during disruptive times such as crises.

1.4 Research Questions

The central puzzle this dissertation addresses lies in understanding the complex interplay between political communication, crisis communication, citizen interaction, and social media ecosystems in the digital age. In an era of rapid and reactive communication reaching a broad and international audience, how do governments communicate central issues that can have consequences for policy agendas and public discourse? How do political actors strategically communicate across different platforms, especially during unexpected events that disrupt established patterns of communication? How does the new online environment differ from traditional legacy media? In times of multilevel governance structures and increasing decentralisation, how do citizens navigate the complexity of attributing responsibility, particularly during crises? These considerations lead to the main research questions explored across the three papers:

- Chapter 2: How do governments communicate issues related to the climate crisis on social media, and how do users react to such content?
- Chapter 3: How do crises affect political parties' issue diversity and communication strategies across online and offline media platforms?
- Chapter 4: How does media reporting affect people's blame attributions on social media, particularly in multilevel governance systems?

These questions are particularly pertinent given the increasing complexity of governance structures globally. As I will elaborate on in Chapter 3, there has been a worldwide trend

towards devolution and multilevel governance in recent decades, with even traditionally centralised states like the UK and France adopting more decentralised approaches (Rodríguez-Pose & Gill, 2003). This complexity creates fertile ground for strategic blame-shifting among political actors, especially during crises (Hinterleitner et al., 2023; Souris et al., 2023), and affects what Hobolt et al. (2013) calls 'institutional clarity': the institutional concentration of power and how it is dispersed across multiple levels of government, resulting in higher or lower levels of institutional clarity.

Beyond these research questions, my dissertation also addresses more fundamental concerns about democratic processes in the digital age and the role of social media. As mentioned previously, the emergence of social media has resulted in a multitude of challenges for public relations practitioners and social media users (Strömbäck & Kiousis, 2019). The empirical chapters contribute to these concerns by addressing how social media transforms democratic processes. I specifically highlight (1) the tension between social media's engagement-driven communication and the idea of an informed citizenship; (2) the fragmentation of the public sphere into various parallel communication arenas; and (3) the role of social media in accountability processes and political learning. Focusing on these areas, my research also contributes to broader questions of how democracies function in the 'fourth age of political communication' (Blumler, 2016) and when their public sphere and discourse infrastructure is increasingly mediated by digital and privately owned platforms.

1.5 Methodology

It has been known for a long time that text creates meaning and reflects collective behaviour and political processes (Firth, 1957; Wittgenstein, 1973). Words and text have been an integral part of political science research, but with new technological developments such as the Internet and social media platforms, scientists have gained an avalanche of text data related to politics (Alvarez, 2016; Cardie & Wilkerson, 2008). The mere quantity of text documents and data points has resulted in the adoption of new methods, often coming from computational science, specifically computational linguistics, but also from other fields such as data science or cognitive

science. While computational text analysis is an incredibly fast-moving field, this dissertation employs some relatively new approaches and applies them to political science topics.

Another reason for this choice of methods is the real-time dynamics of social media data. While other methods, such as experimental survey research, might be more effective for the detection of causal mechanisms, they have also received criticism regarding their generalisability to real-life phenomena, especially in the context of communication research (Berk, 2025; Kinder, 2007; Lau et al., 2021). Social media data, on the other hand, has the distinct advantage of representing realistic developments with time stamps and in longitudinal format. It can also be used to better understand long-term effects and accurately represents the messy information environment of real developments. While this dissertation focuses on social media data and real-time dynamics, I believe that the two methods complement each other, each providing important insights with their own limitations.

Hence, it is also important to note that computational text analysis comes with several concerns and challenges that need to be taken into account and are also addressed throughout the chapters. A major challenge is the connection between the computational methods or models and the often complex constructs in social sciences that need to be measured (Baden et al., 2021). Latent and abstract constructs can be measured in a variety of ways through textual analysis (Nicholls & Culpepper, 2021) and measurement validity and reliability are crucial for computational text analysis (Birkenmaier et al., 2024; Song et al., 2020). Unfortunately, in this field, quality assurance and a 'gold standard' often come with higher costs, as it would require including several human coders or greater computational power. In a similar vein, text analysis can easily introduce systematic biases. If researchers rely only on salient and correlated patterns, a model might measure a different variable than the construct of interest. One example is how a classifier mistakenly identified patterns of incumbency rather than political ideology because these factors were correlated, and incumbency presented a simpler pattern for the model to recognise (Hirst et al., 2014).

The empirical analysis for this dissertation relies on several techniques for validation and quality assurance, although a 'gold standard' is unlikely to be achieved due to resource constraints. Classification models such as the fine-tuned BERT classifier for environmental posts

(Wagner, 2024) in Chapter 2 or the LLM with a few-shot prompt for blame attribution classification in Chapter 4 are evaluated using F1 scores and intercoder reliability metrics. Other models used for the analysis, such as *manifestobert* (Burst et al., 2024) in Chapter 3, have shown great performance in previous studies. Additionally, human involvement is maintained throughout all the empirical chapters and their measurements, especially to ensure at least face validity. As Grimmer et al. (2022, p. 22) states, "[t]ext analysis does not replace humans – it augments them'. This also means that a larger model does not always mean better or more reliable outcomes. Despite the trend towards larger and seemingly superior LLMs, I believe that for many analyses, simple techniques or models can achieve equally good or better results at lower computational costs and by avoiding the black box of foundational models. Without question, reproducibility presents a central priority of this dissertation.

1.5.1 Methods

Across the three empirical chapters, this dissertation employs various approaches to analyse political communication on Facebook. The methodological framework combines computational text analysis, statistical modelling, and comparative approaches to examine how political actors strategically communicate across different arenas.

The first study presented in Chapter 2 analyses how liberal democracies communicate about environmental issues on social media platforms and how citizens interact with their communication. The data for this analysis is derived via *CrowdTangle*, an official platform provided by Meta to access Facebook data, which ceased operations in August 2024. The final dataset comprises more than 23,000 Facebook posts from 26 liberal democracies, containing both official government pages and personal accounts of Heads of Government (HoG) and verified by Facebook as official accounts or public figures. After filtering out posts related to environmental topics using a fine-tuned BERT model (Wagner, 2024), I operationalise three distinct logics of social media communication into measurable features. I then used Principal Component Analysis and Hierarchical Clustering to determine the three clusters of government communication across all countries and legislative periods. Finally, I assess the effectiveness of communication strategies through engagement metrics such as interaction rates using a Poisson model with

fixed effects.

The next chapter examines how German political parties adapted their communication strategies following Russia's 2022 full-scale invasion of Ukraine. Using more than 5,000 text documents of parliamentary speeches and Facebook posts three months before and after the invasion, I code each document according to the classification system of the Manifesto Project using a fine-tuned BERT model called *manifestoberta* (Burst et al., 2024). I then compute the dependent variable using the exponentiated Shannon's Information Entropy Index, which measures attention concentration on single/multiple issues across agendas of different sizes. I also code the impact of the invasion through a binary variable and account for party status. To measure the effect of the invasion on parties' agenda diversity, I utilise OLS regressions with fixed effects for parties and standardised predictors.

The final empirical chapter investigates blame attribution patterns in social media discourse following the 2021 Ahrtal floods in Germany. This study employs a localised and open-source Large Language Model (LLM) relying on LLama3.1 8B to classify posts based on few-shot prompting. Blame attribution is defined as the (pre)conception of blame and responsibility assigned to an actor in response to a negative event (Shaver, 2012), which results in 7,108 posts containing identifiable blame attribution and specific objects of blame such as the federal government, state government, or local government.

I then identify two sets of dependent variables. The first set measures the probability that a Facebook user attributes blame to a particular level of government, and the second set captures shifts in blame attribution over time. The main independent variable assesses the influence of media discourse on public blame attribution by capturing the number of media mentions assigning blame to a specific government level within the previous three days. I model the effect on user blame attribution and change thereof using Firth's penalised likelihood logistic regression (Heinze & Schemper, 2002).

1.5.2 Data Limitations

Each article relies on data derived from Facebook, accessed via *CrowdTangle* before its closure in August 2024. Despite the fragmentation of social media and algorithmic changes, Facebook

remains one of the most important platforms for news access and political communication over the past decade (Newman et al., 2024). It is important to note that Facebook data comes with its own set of constraints. As pointed out in Chapter 2, it is not necessarily possible to generalise from one social media platform to another. Therefore, the findings of this dissertation are only cautiously applicable to other platforms such as X.

Moreover, although I access the data through an official portal provided by Meta, it is impossible to ensure that *CrowdTangle* actually provides access to all posts. There is evidence of bias in relation to Search Engine Result Pages for accessing social media (Poudel & Weninger, 2024), as well as anecdotal accounts that TikTok API and web scraping yield different results. Lastly, as mentioned in Chapters 2 and 4, algorithms play an important role on these platforms and have also undergone multiple and often opaque changes over the years, which complicates the interpretation of, for instance, interaction rates.

Beyond Facebook data, Chapter 3 also relies on parliamentary data from Germany in order to enable the comparative research outlined previously. For this purpose, I am relying on the *SpeakGer* dataset (Lange & Jentsch, 2024). Unfortunately, this dataset is comparatively messy and is not as precise as other datasets with parliamentary speeches such as ParlSpeech (Rauh & Schwalbach, 2020) or other similar datasets (Schwalbach et al., 2025; Sebők et al., 2025), which unfortunately do not include the required time frame. However, I am not expecting a systematic error in the analysis of Chapter 3 due to this dataset noise.

1.6 Contribution

The dissertation makes several theoretical contributions to the literature on political communication and social media research. Across all three empirical chapters, it demonstrates several specific methodological considerations that contribute to the study of political communication. First, it employs multilingual analysis through automated translation, enabling cross-country comparison of communication patterns. Second, it implements cross-platform analysis, comparing communication strategies across different arenas such as social media and parliamentary speeches. Third, it applies temporal analysis to examine how communication consistency and

issue attention evolve in response to external events, from gradual changes in environmental communication to rapid shifts following geopolitical crises or natural disasters.

My dissertation makes significant empirical contributions by analysing real-world communication practices. As discussed in Chapter 4, much of the existing literature on blame attribution is grounded in experimental studies or focuses on presidential systems, particularly the United States (Busby et al., 2019; Malhotra et al., 2008). However, fewer studies examine real-time blame dynamics within complex multilevel systems, where crises frequently unfold across overlapping jurisdictions or multiple parties. The social media data used in my dissertation allows for time-sensitive analyses of real-world data.

Furthermore, I employ novel text analysis techniques to test the hypotheses developed in the respective chapters. While Chapter 3 leverages existing classification models such as *manifestoberta* (Burst et al., 2024), a multilingual classifier based on the Manifesto Project (Lehmann et al., 2024) and the multilingual XLM-RoBERTa large model, I also contribute to the field by introducing a newly fine-tuned model specifically designed to classify environmental social media communication (Wagner, 2024).

Moreover, along with proposing a conceptual model to analyse social media communication outlined previously, I also operationalise this model into measurable features. I hope that this can serve as a starting point for other researchers to apply this operationalisation to their research and/or further develop it. I believe that it is crucial for research using computational text analysis to not only rely on recent innovative developments such as LLMs or BERT models but also on more 'traditional' natural language processing techniques such as sentiment analysis, regular expressions (pattern matching in text data such as a sequence of characters), or Part-of-Speech tagging (assigning grammatical categories to words in a sentence such as 'verb').

Finally, access to social media data remains a significant challenge for researchers. Since many platforms have restricted access to their APIs[1], data retrieval has often entered legal grey areas, creating substantial obstacles for scientific inquiry (Davidson et al., 2023). Through access to *CrowdTangle* before its closure in August 2024, a Meta-owned platform for retrieving

[1]Application Programming Interfaces (APIs) previously provided a standard mechanism for accessing social media data, but platform restrictions have increasingly limited researchers' access.

Facebook data, I was able to develop the datasets used in this dissertation and hope to make them accessible after the publication of my chapters.

Theoretically, my dissertation advances our understanding of how governments communicate on social media. It provides further insights into the surprising lack of systematic and comparative research on government communication, both online and offline (notable exceptions among others are DePaula and Dincelli (2018) and Mergel (2013b)). It additionally offers important insights into how environmental issues are communicated, which can serve as a baseline for research on other policy areas.

Second, the dissertation with Chapter 3 enhances our understanding of agenda-setting in a hybrid media environment. By examining how unexpected crises affect party communication across different channels, it provides insights into how political actors navigate structured environments such as parliamentary debates and more dynamic spaces like social media platforms. This contributes to a more nuanced approach to studying how parties navigate crises and adapt their communication strategies over time.

The last empirical chapter, Chapter 4, contributes to blame attribution theory by examining how external factors influence how blame attributions evolve over time. While research has extensively examined the role of partisanship in blame formation (Gomez & Wilson, 2008; Maestas et al., 2008; Tilley & Hobolt, 2011), less attention has been paid to how factors such as media coverage provide citizens with new information about crises, especially on social media, potentially altering their initial perceptions and fostering political learning.

Beyond its theoretical and methodological contributions, this dissertation has important practical implications for government communication strategies and democratic governance. By analysing how citizens interact with different types of government content on social media, the study provides valuable insights for policymakers seeking to enhance public engagement and build trust in governmental institutions. Understanding which forms of communication are more likely to provoke responses can help governments develop more effective communication strategies, particularly regarding complex policy issues and topics that are more likely to have crisis-related service posts, such as information on hotlines. This also contributes to previous research pointing out that if governments want to use social media effectively, they may need a

different approach to their communication strategy (DePaula & Dincelli, 2018; Mergel, 2013b; Zavattaro et al., 2015).

Lastly, by examining blame attribution processes during crises, this research contributes to our understanding of democratic accountability in multilevel governance systems. In such systems where responsibilities are distributed across different levels of government, citizens may struggle to attribute blame correctly, potentially undermining democratic accountability mechanisms. By examining how people navigate this complexity and how media reporting influences blame attribution on social media, this research contributes to our understanding of democratic processes in complex governance systems.

A particularly important point, as highlighted in Chapter 3, is that the interaction between media, political actors, and institutional reports shapes not only citizens' evaluations of government performance but can also affect public trust in governance. This has implications for how governments communicate during crises and how they manage blame attribution processes. The study's findings emphasise the importance of political learning and quality journalism, especially in contexts where incidental exposure becomes more likely (Bakshy et al., 2015).

1.7 Thesis Layout

This dissertation examines crisis communication on Facebook through three interrelated studies, each addressing a different dimension of how crises are communicated and perceived in digital environments. The three papers focus on (1) communication patterns of governments, (2) the effect of crises on agenda diversity, and (3) media effects on blame attribution. Together, these studies provide a comprehensive account of how crises are communicated, politicised, and interpreted in the digital sphere. The following paragraphs outline the structure of the dissertation in greater detail. Figure 1.1 presents an overview of the dissertation, illustrating how each empirical chapter addresses a different aspect of crisis communication with specific methods, varying actor perspectives, and geographical scopes. I then provide an overview of the chapters.

There are two important perspectives on crisis communication and politics that vary across

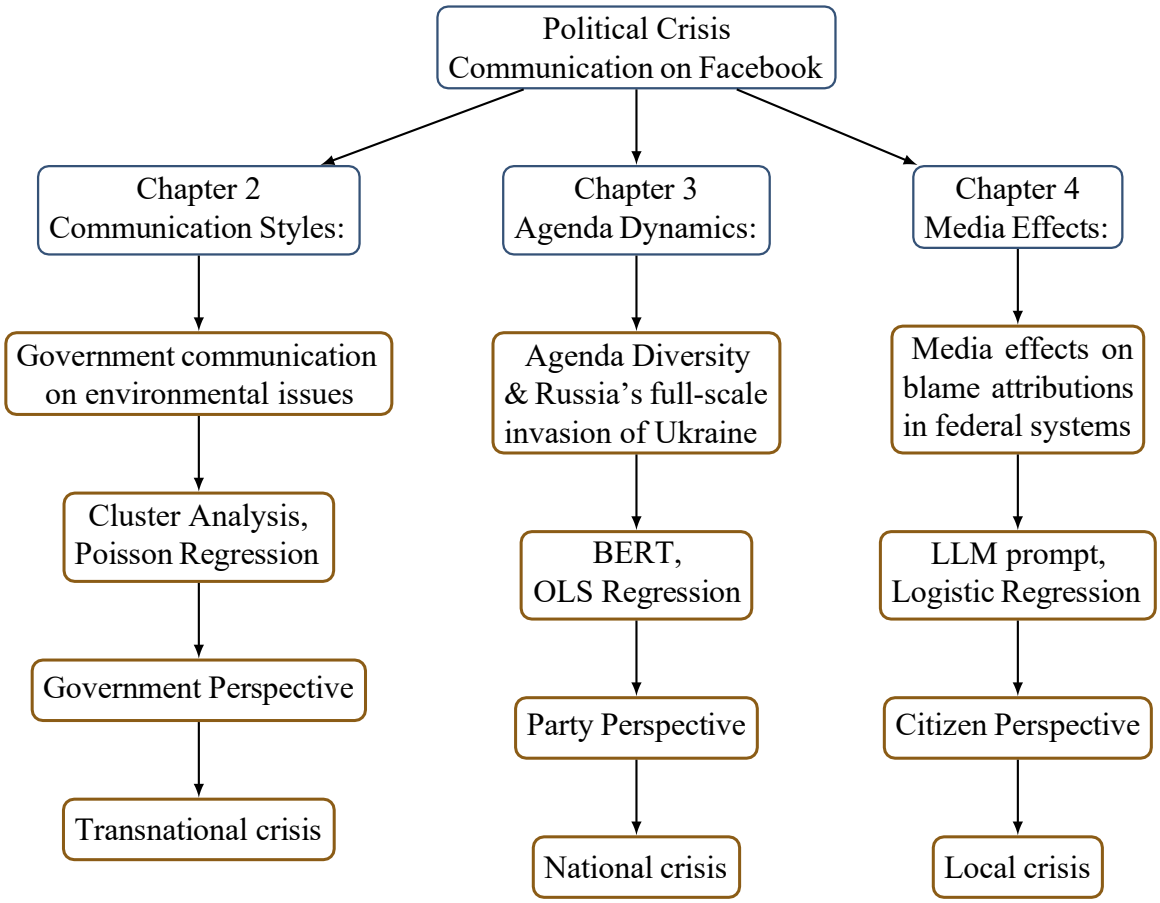


Figure 1.1: Overview of the dissertation structure on crisis communication on social media.

each chapter: the role of different actors and varying geographical scales. While Chapters 2 and 3 mainly focus on how political elites communicate, Chapter 4 emphasises the role of citizens on social media. Chadwick's (2017) conceptualisation of the hybrid media system illustrates how different actors are now required to interact differently with the new online ecosystem. Indeed, the changes introduced by the online ecosystem have resulted in a 'fourth age of communication', which is characterised by greater complexity, shifting elite-mass relationships while paradoxically creating space for both marginalised voices and reinforcing hegemonic ideologies and narratives simultaneously (Blumler, 2016). These changes have each distinct consequences, which I will address.

Actors are placed at different points in this new communication environment. For parties, social media has created what Chadwick (2017) calls an 'asymmetric interdependence' with legacy media channels. Although parties' communication is still skewed towards traditional media logics, they need to embrace both, which has resulted in multiple simultaneous party

agendas (Ivanusch, 2025), with different rules and content as presented in Chapter 3. Social media communication for governments, on the other hand, seems to conflict with their usual communication procedures, and its navigation is not straightforward. Governments have no control over communication platforms and are faced with high levels of uncertainty (Mergel, 2013a). This results in mismatches between potential government goals such as transparency or connection with citizens and platform functions, as discussed in Chapter 2. Finally, citizens as users and (co-)producers of social media content have so far probably received the most attention (DePaula & Dincelli, 2018; Kalsnes et al., 2017; Warren et al., 2014). The complexity of the new media environment and the high levels of information raise a multitude of questions on how social media has changed citizens' relationships with politics, from fake news to echo chambers, or processes of political learning as addressed in Chapter 4.

The second perspective addresses the geographical scope of the dissertation. While crises have always been part of politics, the scale and variation, as well as the role of social media, bring forward new insights. Henig and Knight (2023) posit that we are living in times of 'poly-crisis' with crisis events that not only span various regions but also countries and continents, potentially affecting each and every one, such as the COVID-19 pandemic. Moreover, social media and processes of globalisation have shifted national debates to a global level, creating global attention for regional or national crises (Castells, 2008). However, not every crisis event affects political actors' behaviour to the same extent, nor is it captured on social media equally. While it is important to draw attention to the full set of crisis events and their interdependence, I would like to shed light on three different events with varying actors and on distinct scales. It is easy to miss the small – or often not that small, depending on the perspective – effects of regional disasters in the face of wars and pandemics. However, they all have their political and social consequences.

The first analysis, Chapter 2 examines how governments use social media platforms to communicate with citizens and how different communication approaches affect public engagement. Through cluster analysis of Facebook content from governments in liberal democracies over a ten-year period, I identify three distinct communication styles—Formal Institutional Communication, Strategic Policy Advocacy, and Symbolic Leadership—that are shaped by the

interplay of platform affordances, issue characteristics, and actor-specific factors rather than by ideological positions or environmental topic specificity. My analysis demonstrates that these communication styles distinctly influence user engagement, with citizens showing less interest in formal, informational content and responding more positively to symbolic, action-oriented messaging. A finding that has important implications for governments seeking to effectively disseminate critical information through social media's engagement-driven algorithms.

Turning towards the impact of sudden crises, Chapter 3 investigates how crisis events impact the issue diversity of German parties' communication across different channels, focusing on Russia's full-scale invasion of Ukraine. The analysis of over 5,000 Facebook posts and parliamentary speeches reveals a general increase in agenda diversity, with effects varying by party status and communication medium. Parliamentary speeches show a uniform increase in agenda diversity for both governing and opposition parties, constrained by institutional norms, whereas opposition parties maintain broader issue agendas on social media. These findings highlight the importance of studying party communication across multiple platforms and underscore how institutional contexts shape strategic messaging during crises. The study contributes to research on agenda-setting by emphasising the interplay between institutional roles, media environments, and crisis-induced communication strategies.

Finally, Chapter 4 focuses on citizens instead of political actors and explores how multilevel governance, declining trust in media and political elites, and the rise of social media influence blame attribution during crises. The study analyses 50,000 Facebook posts focusing on the 2021 Ahrtal floods in Germany and classifies blame attribution using a localised LLM with few-shot prompts resulting in 7,000 posts containing blame attribution. I show that prior media reporting significantly shapes users' blame attribution and also influences them to shift blame according to new information. Notably, political actors show different blame patterns from ordinary citizens. The findings contribute to debates on political learning in online ecosystems and accountability processes in complex governance structures.

Chapter 2

Unravelling Government Discourse: A Decadal Analysis of Government Communication on Environmental Issues in the Age of Social Media in Liberal Democracies - UNDER REVIEW

2.1 The Evolution of Online Government Communication

In the digital age, governments increasingly rely on social media to communicate with the public, shape policy narratives, and manage crises. Research on government communication initially saw social media as a novel tool to address democratic deficits to revitalise public trust in political institutions by fostering open government, increasing transparency, public engagement, and confidence in democratic processes (Song & Lee, 2016; Torcal, 2014; Warren et al., 2014). Although positive cases of government social media communication have been observed, in particular in relation to service announcements and crisis communication at the local level (Gao & Lee, 2017; Graham et al., 2015), there is not much known about how governments use these platforms to communicate political issues or how citizens engage with them. Social media has created a novel communication channel with instantaneous distribution of information and user feedback, which informs further customised communication strategies for target audiences (Ennser-Jedenastik et al., 2022; Robbins, 2020). However, there is a lack

of a comprehensive analysis of the specific content and strategies used, despite some notable attempts to conceptualise government communication (DePaula et al., 2018; Mergel, 2013b). This gap is particularly critical given the integral role of communication in policy implementation and crisis management (Lawrence, 2014), especially in the face of social media misuse to undermine democratic institutions. It raises critical questions about the nature of government engagement on social media, particularly in balancing democratic norms with effective communication.

This study examines how governments use Facebook to communicate about environmental issues and how these communication strategies influence user engagement. I conceptualise government communication through the interplay of three logics – actor, issue, and platform affordances – highlighting how political actors move beyond traditional issue ownership strategies (Kruikemeier et al., 2022). Using a novel dataset of ten years of Facebook posts from governments in 26 liberal democracies, I develop indicators of communication output and identify distinct communication clusters. These clusters reveal consistent patterns shaped by platform affordances, external factors such as climate vulnerability, and government goals. Crucially, their impact on user engagement varies, with significant differences emerging when disaggregating interactions.

The structure of this study is as follows: first, I present a theoretical framework for social media communication, detailing the various intertwined logics that influence communication outputs and strategies. Next, I develop indicators for each communication logic, which are used to identify clusters of communication. Lastly, I present the clusters and analyse their effects on engagement metrics.

2.2 Governments and Social Media Communication

Governments are increasingly incorporating social media into their communication strategies, although at a gradual pace. Most of the OECD countries now maintain official accounts on various platforms, reaching significant portions of their populations and achieving high levels of interaction (OECD, 2021a). Social media holds the potential to reduce political exclusion and to foster a more collaborative and responsive public policy design (Mickoleit, 2014). These digital opportunities can improve the effects of democratisation of public information and increase trust levels, as social media is often perceived as more credible than legacy media (Procopio & Procopio, 2007). The low costs and rapid dissemination of information make social media particularly valuable for governmental actors during crises or for bypassing legacy media gatekeepers. The drive to improve government-to-citizen relationships and democratic policy processes, such as information dissemination, outreach, and transparency, has been a major factor in adopting official social media channels (Kahne & Bowyer, 2018).

These implications are especially pertinent to complex global issues such as environmental communication. Environmental issues have become central in government communication due to their transnational nature, complexity, and increasing domestic relevance influenced by natural disasters and their economic impacts. Understanding how governments communicate environmental issues via social media offers insights into their policy priorities and strategies. This communication shapes the public perception of how governments handle environmental issues, whether as a crisis, a call to action, or through informational guidance (Lawrence, 2014). Government communication has wide-ranging implications, from setting agendas to implementing policies, and social media has the potential to facilitate these processes and foster government-citizen relationships on various fronts.

Moreover, it is crucial to understand not only the government communication on social media but also how citizens interact with it. The direct link between citizens and the government enabled by social media platforms creates a new feedback mechanism. Through the agenda-setting capacity of social media, governments can highlight or minimise issues, which can be reproduced and magnified by citizen interaction (Chatfield & Reddick, 2018). Therefore,

government communication becomes a result of co-production instead of a one-way communication channel, as in the case of press releases. Citizens also react differently to online content, with some posts being more likely to provoke a response than others (Koc-Michalska et al., 2021). This has important implications considering that social media remains one of the main gateways to news access (Newman et al., 2024). Moreover, government communication and its reproduction significantly shape public opinion and, in some cases, prompt policy or personnel changes, such as during the Trump presidency of 2017 (Ş ahin et al., 2021). Therefore, the type of communication and its potential for interaction can lead to structural changes or reinforce the status quo, depending on the prevailing political discourse (Lawrence, 2014). At the same time, their communication can also be affected by platforms themselves through changing their architectures, as exemplified by Meta's revisions implemented in anticipation of the 2025 Trump presidency (Paul et al., 2025). This underscores the need to critically assess not only how these platforms are leveraged in government communication, but also how citizens interact with its different forms.

Despite these acknowledged changes and consequences of government communication and social media, there is a limited understanding of how governments communicate on these platforms or how their communication is received, particularly regarding environmental issues. Although governments have adopted social media strategies, a systematic overview of their communication practices is lacking. Given the context-dependent nature of social media communication, which requires audience engagement distinct from traditional government services, it is crucial to examine this area further. This chapter addresses the question of how governments communicate environmental issues on social media and how users react to such content.

2.3 Logics of Social Media Communication

Early conceptual models categorised government communication into push, pull, and networking strategies, linked to goals like transparency, participation, and collaboration. These approaches influence trust, deliberation, and community-building efforts (Mergel, 2013b). Over time, self-promotion, symbolism, and political marketing have also gained prominence in gov-

ernment communication, often taking precedence over democratic deliberation (DePaula et al., 2018). Expanding on these early models, Wukich (2021) introduced five categories of government social media communication: transparency (e.g., updates on actions, expenditures, and crises) (Chatfield & Reddick, 2018), symbolic presentation (e.g., marketing and competence displays), customer service (e.g., service updates and public hotlines), coproduction (e.g., calls for participation or action) and citizen participation (e.g., policy deliberation and public engagement). These strategies align with broader governance goals but are adapted to the constraints and affordances of specific platforms.

Following this literature, I expect that social media communication not only relates to government goals but operates within a complex interplay of multiple logics that influence each other, rather than existing in an isolated sphere. For example, during a crisis, a government might focus more on what (Wukich, 2022) calls transparency and customer service than on other categories. The content posted on social media represents a deliberate choice shaped by various factors, which I categorise into the logic of platform, the logic of issue, and the logic of actor. Combined, these factors produce specific communication outcomes. In this study, I focus on the logic of Facebook, the logic of environmental issues, and the logic of government communication. Figure 2.1 illustrates these interrelated logics and their interaction resulting in the final communication output.

It is important to clarify that I am not suggesting a direct causal relationship between these logics, but rather a nuanced interaction of factors that collectively impact the final communication output. Moreover, communication dynamics are bidirectional and may constrain each other, which can result in trade-offs or adaptive strategies. This approach not only highlights the nuanced dynamics of social media communication but also allows for a more systematic comparison and operationalisation.

2.3.1 Logic of Platforms: Facebook

The first logic, widely discussed in recent literature (Boulianne & Larsson, 2024; Kalsnes et al., 2017; Newman et al., 2024), refers to the digital architecture of social media platforms, which governs their operational rules, network structures, and functionalities. It reflects the concept

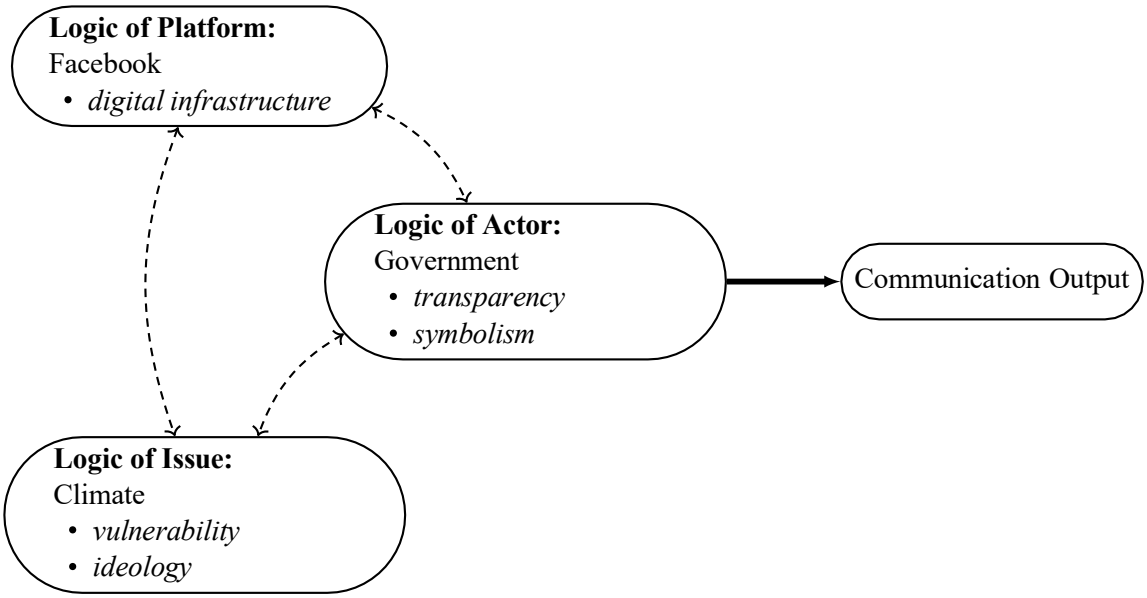


Figure 2.1: Concept map of social media communication.
Dashed bidirectional arrows represent interactions.

of mediatisation, namely that "no actor in the public sphere can risk ignoring the media and its operating logic" (Esser & Strömbäck, 2014, p. 224). The architecture of platforms shapes platform-specific affordances, or, in other words, communication opportunities available to actors. Therefore, the way in which actors communicate on this platform is fundamentally reshaped by its architecture. As Chadwick (2017) argues, today's media system is characterised by older and newer media logics that interact and redefine communication behaviour. For example, Instagram emphasises short-form visual content, while X (formerly Twitter) enforces character limits, which require more concise communication strategies (Bossetta, 2018). Although some elements are generalisable, such as rapid and direct communication with users, platforms have specific constraints that influence communication strategies.

This study examines Facebook due to its extensive use and distinctive features. Despite growing platform fragmentation, Facebook remains a leading platform for news consumption, with its parent company Meta dominating as a news gateway (Newman et al., 2024). It is also a key channel for political actors (Magin et al., 2017), offering visibility, sustained interaction, and network-based reach. The social graph structure of Facebook, which emphasises the content shared by friends and contacts (Newman et al., 2024), can enhance exposure to political and government accounts within the networks of users. These features make Facebook particularly effective for disseminating information to non-subscribers, in contrast to platforms such

as Instagram, which prioritise alternative content sources (Kalsnes et al., 2017; Newman et al., 2024; Treem & Leonardi, 2013).

2.3.2 Logic of Issue: Environment and Climate Change

The second logic pertains to the specific issue being communicated and its unique characteristics. According to framing theory (Entman, 1993), certain topics or their aspects are emphasised or avoided, which shapes their interpretation. In addition, topics are not discussed in isolation but are embedded within a broader context influenced by various external constraints. Actors engage in strategic 'meaning-making contests' (Alink et al., 2001) to dominate the narrative regarding a specific topic and to influence the public's perception thereof. This context depends in part on the actor, but also on the prevailing discourse surrounding the topic. Furthermore, due to the digital architecture of a platform and the importance of a topic, user engagement varies significantly between different topics (Heiss et al., 2019), making the manner of communication critical in terms of topic and also conditional on the platform. In the context of the logic of environmental issues, I am focusing particularly on political ideology, climate vulnerability, and environmental expenditure.

Political ideology itself already has an effect on online communication, such as topics and post frequency, particularly on social media (DePaula & Dincelli, 2018). In environmental communication, the ideological positioning of the actors represents an additional crucial element. The framing or extent of climate-related communication can shift depending on actors' ideology, such as their left-right position. In the context of climate-related communication, it not only influences its frequency but also shapes the narrative used (Boussalis et al., 2018). A reason for this is also that environmental concerns have progressively gained prominence in the public and electoral choices (Kenny & Langsæther, 2023; Puleo et al., 2025). Political parties also increasingly exhibit patterns of differentiation and competition regarding environmental policies, potentially signalling a transformation of environmental issues from valence issues to positional issues characterised by fundamental ideological disagreements regarding appropriate approaches and solutions (Båtstrand, 2014; Buzogány & Ćetković, 2021; Carter et al., 2018; Katsanidou & Gemenis, 2010). Therefore, it is essential to consider specific stances on

environmental protection, as they might influence an actor to emphasise more policy-focused communication or to address environmental issues more inconsistently.

Beyond ideology, external factors can also influence the extent and form of communication. In this case, the climate vulnerability of a country and its expenditure on environmental protection play an important role. Boussalis et al. (2018) show that cities highly vulnerable to climate change are more likely to communicate about environmental issues, often highlighting their own efforts. This is further influenced by public opinion and the salience of the respective issue; for example, if a government spends a lot on environmental protection or prevention of natural disasters. Actors therefore have an incentive to comply with public interest and need to address issues of high salience, no matter their preferences. Therefore, I anticipate that higher levels of environmental expenditure will result in more climate-related communication, since actors are required to justify their expenses. Even more so if the expenditure occurs in a country with low climate-related risks.

2.3.3 Logic of Actor: Government

The third logic focuses on governments as actors of interest. Following theories of strategic political communication and public relations, political actors – whether they are governments or not – seek "to influence and to establish, build, and maintain beneficial relationships and reputations with key publics and stakeholders to help support [their] mission and achieve [their] goals" (Strömbäck & Kiousis, 2019, p. 11). Government communication, more narrowly, not only includes political purposes but also civic ones. Their social media communication is shaped by strategic goals, normative democratic objectives, and platform constraints (DePaula et al., 2018; Mergel, 2013b; Strömbäck & Kiousis, 2019; Wukich, 2022). Governments are supposed to pursue democratic objectives such as transparency, trust, and accountability while also influencing public opinion, setting goals, and managing crises. These goals are reflected in their main public communication objectives, which are focused on raising awareness of services and policies, promoting transparency, and strengthening public trust (OECD, 2021b). This also means that government communication should be comprehensible to have any effect on citizens' political knowledge structures (Bischof & Senninger, 2018; Tolochko et al., 2019).

Governments also employ communication strategically, such as blame and credit attributions, to shape public perceptions of their actions. They highlight success while deflecting criticism. These strategies are often closely related to political priorities and external factors, including environmental spending or policy actions (De Benedictis-Kessner, 2022; Wenzelburger & Hörisch, 2016). Moreover, some governments prioritise transparent communication during crises, while others adopt more favourable and symbolic styles, which resemble marketing strategies depending on their political contexts and objectives. In particular, symbolic communication is often related to strategic self-presentation to create a specific impression, including attributions of competency and likability using self-references and positive presentation (Cantor et al., 1982). Research has shown that even if social media communication serves mainly as information provision, the kind of posts also differs between government departments depending on their respective purposes (DePaula et al., 2018).

However, those objectives are mediated by platform affordances, meaning the previously detailed logic of platform. For example, communication that educates and informs the public demonstrates competence and builds trust. Platform-specific constraints, such as Facebook's architecture that penalises posts with external links referring to official government websites, can create trade-offs that complicate transparency efforts (Hutchinson, 2024; Mergel, 2017). Furthermore, during crises, effective communication can foster public support for decisions, which is intensified by platform affordances that enable the amplification of messages in real time (Boin et al., 2017).

Government communication can also be influenced by external factors related to the logic of issue, in this case, the environment. For communication outputs, this means that the level of transparency or symbolism in Facebook posts can be influenced by both a country's vulnerability to climate change and the actors' left-right positions and level of support for environmental protection. In countries at higher risk, I expect not only a higher frequency of posts related to environmental issues (Boussalis et al., 2018), but also higher levels of transparency and symbolism in communication. This is due to the frequent occurrence of natural disasters such as floods and droughts, necessitating both the presentation of actionable reforms and symbolic displays of performance and competence.

Additionally, this relationship is mediated by the ideological positions of the respective governments, with expected significant differences between left- and right-wing governments, as well as between those strongly supporting environmental protection and those that do not. For example, following previous research (Guillamón et al., 2011; Piotrowski & Van Ryzin, 2007), I expect left-leaning governments, especially in vulnerable countries that favour environmental protection, to exhibit higher levels of transparency in their communication as they tend to be more concerned about good governance and prioritise access to government information in principle. Furthermore, these governments are more likely to consistently mention environmental issues than others (Boussalis et al., 2018). In contrast, I anticipate right-wing governments, in particular those with lower support for environmental protection, to focus primarily on symbolic communication. In other words, such government communication should show higher levels of ceremonial language such as expressions of condolence or mentions of summits or meetings, while, for instance, having few references to external webpages for further information.

Lastly, I also expect variation between the types of government accounts. Countries such as the United States have different government accounts that represent different actors or functions. While accounts that address more administrative aspects of a government might contain more transparency elements to communication activities, private accounts of Heads of Government or strictly representative government accounts I expect to be more symbolic in nature to create a favourable presentation through symbolic features such as emphases on meetings or ceremonial language (DePaula et al., 2018; Wukich, 2022). Despite these expectations, the exploration of communication outputs will be primarily inductive, allowing for the discovery of patterns and themes that may not have been anticipated.

2.4 Methodology

2.4.1 Data Collection

This analysis of government communication focuses on Facebook as a social media platform. Despite the fragmentation of social media, algorithmic changes, and the devaluation of news by

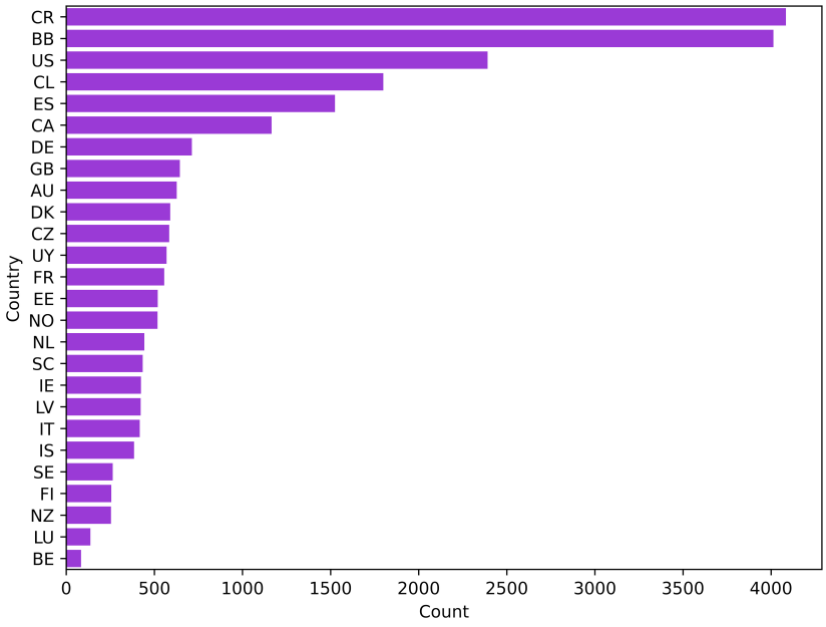


Figure 2.2: Overview posts of all included countries

Meta, Facebook remains the most important platform for news access and one of the most used networks in countries over the past decade (Newman et al., 2024). I derived the data for this analysis via CrowdTangle before its closure. Since this study relies on normative assumptions of democratic governance, I focus on the communication of liberal democracies as defined by Nord et al. (2024), based on indicators of electoral democracy and the liberal principle of democracy. This results in a total of 26 included countries, as shown in Figure 2.2.[1] For each country, I have included both Facebook accounts of official government pages and personal accounts of Heads of Government (HoG).[2] In either case, the accounts are verified by Facebook as official accounts or public figures/political individuals. Regarding the timeline, the dataset incorporates all Facebook posts from 2015 until April 2024, with HoG accounts being included according to their time in office. In addition, I have separated the government accounts along the different cabinets to account for changes in government setups. The final database contains

[1]Some countries have been excluded from the analysis despite their definition as a liberal democracy. One example is Japan, which has a government account on Facebook that is, however, directed towards an international audience, tourists, or expats and not domestic citizens. In Japan the social media landscape differs with LINE Yahoo being the main social media channel for news access (Newman et al., 2024).

[2]While in most cases HoG refers to the highest official presiding over executive power in a country such as in presidential systems, this is not always the case. For instance, in semi-presidential systems such as in France, the HoG is appointed by the Head of State and must answer to them. In those cases, the official Facebook account of the respective executive Head of State is included instead of the HoG.

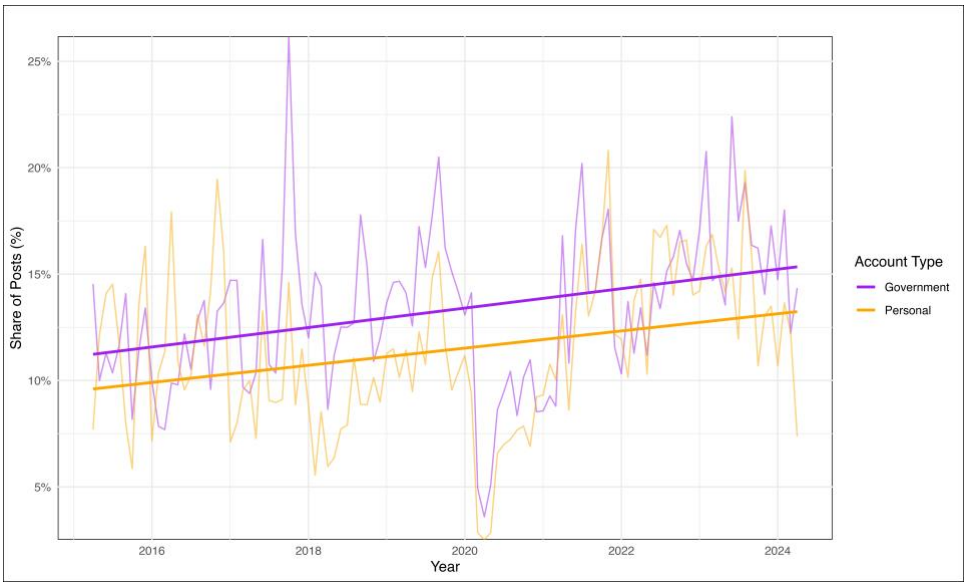


Figure 2.3: Personal HoG accounts compared to formal government accounts over time.

a total of 23,815 posts.[3]

To prepare the data for analysis, I have used the *googletrans* library in Python (Han, 2015) to translate all Facebook posts into English. I then fine-tuned the BERT model *distilroberta-base-climate-detector* to filter posts that are related to environmental topics and only kept those with over a 99% probability of containing such topics. Figure 2.2 displays the resulting posts distributed between countries. Figure 2.3 shows that one can observe a small increase, with a significant drop in communication during the COVID-19 pandemic over time. Government accounts have a larger overall share of posts compared to personal accounts, accounting for up to 15% - 20% of their overall communication in 2023. With the 2020 drop in environmental communication due to the pandemic, the graph also confirms that the dataset indeed includes climate-related Facebook posts.

2.4.2 Operationalisation of Features

The previously discussed communication logics are structured into several concepts, which are then operationalised into features. Table 2.1 provides an overview with examples for each feature. The features of each concept are used as indicators for clustering government commu-

[3]For an overview of the data see Table A.1 in the Appendix.

nication patterns. The concepts and their features are developed based on previous literature, as discussed earlier.

For the main logic, the logic of government, I draw on established frameworks of public administration and communication studies. Following Wukich (2022) and DePaula et al. (2018), it comprises two main concepts: transparency and symbolism, each requiring distinct measurements. Transparency, defined as "the ability to find out what is going on inside a public sector organi[s]ation" (Piotrowski & Van Ryzin, 2007, p. 208), represents a foundational aspect of democratic communication and involves providing government information and ensuring its accessibility. To capture the nuances of this concept, I measure three different features.

First, I measure language complexity through Björnsson's (1968) readability index LIX, which has been shown to generate reliable evaluations for text complexity across languages (Anderson, 1983).[4] Lower values of this measurement refer to simpler and more understandable language structures and thus higher levels of transparency. This choice reflects the argument that accessibility and comprehension of information is crucial for transparency (Grimmelikhuijsen & Welch, 2012; Rauh, 2023).

Second, government activity and the action orientation of a post are measured by its verb-to-noun ratio on a scale of 0-1. Typical everyday language is characterised by a high presence of verbs, while technocratic language, for instance, is associated with a nominal style, which obscures political actions (Rauh, 2023; Thibault, 1991). Following Rauh (2023), I calculate this measure as f(Verbs)/(f(Nouns)+f(Verbs)), meaning that the higher the score, the more action-oriented a post is.

Lastly, the occurrence of links is also included as an indicator of transparency, as they increase citizens' ability to access government records (Cucciniello et al., 2017; Piotrowski & Van Ryzin, 2007). The binary measure of presence or absence of a link represents a useful indicator of whether governments would like to further provide additional information resources, regardless of their content. In combination with the other two indicators, this operationalisation of transparency provides a grounded and nuanced understanding of transparency for government communication.

[4]See Section A.3 in the Appendix for more details on measurements of readability and its variations.

The second concept, related to the logic of government, symbolism, refers to the (positive) self-presentation of the government or HoG, emphasising competence and public relations, such as achievements or showcasing work. Following DePaula et al. (2018), symbolism is operationalised by measuring posts mentioning summits or meetings using regular expressions, self-referential language (first-person singular and plural), and symbolic acts, including expressions of ceremonial language such as condolences and congratulations, also identified through regular expressions.

The next logic, the issue of climate, includes two main concepts that are external factors. Given the interconnections between external factors and communication practices outlined in the previous section, the inclusion of variables such as vulnerability, ideology and environmental expenditure in the cluster analysis is theoretically and methodologically justified. Communication patterns do not emerge in isolation from the contextual factors that shape them, but rather represent a response to both internal preferences and external pressures. By incorporating these variables into the clustering process, I am able to identify holistic patterns that reflect the real-world conditions under which government communication occurs. While a supplementary analysis excluding these variables is provided as a robustness check (see Appendix A.5), the main analysis maintains these external factors as integral components of the communication ecosystem, consistent with the theoretical framework that argues for the interdependence of actor characteristics, platform affordances, and issue-specific contexts in shaping social media communication.

The first concept related to the logic of climate, Vulnerability, is measured using the Vulnerability Index, which refers to a country's "[p]ropensity or predisposition [...] to be negatively impacted by climate hazards" (Chen et al., 2023, p. 5) for each respective year until 2022, which is the latest year available. Countries with low vulnerability are, for example, Norway or Canada. The most vulnerable countries included in this analysis are, for instance, the Seychelles and the Netherlands. Furthermore, I have included several country-specific variables such as a country's yearly expenditure on environmental protection as a percentage of GDP (IMF, 2024). The ideology of a government is based on two indicators: the actor's left-right placement and their pro-environment stance, both derived from the Manifesto Project Database

(Lehmann et al., 2024). For personal accounts, I use their party scores closest to their entry into government, and for government accounts, the scores of the respective head of government during each legislative period.

The final logic, social media logic is particularly characterised by its specific algorithms and affordances. Communication consistency is measured by the average frequency of posts, which indicates how often actors post on environmental issues. On the one side, consistent high-frequency communication can have electoral benefits (Koc-Michalska et al., 2021), whereas infrequent posts might suggest the prevalence of another topic or a strategic avoidance. Multimodality is measured by whether posts include elements beyond basic text, such as links, videos, or photos, as indicated by *CrowdTangle*. The style of communication is assessed by the length of posts (number of characters) and tonality (whether a post is positive or negative), based on a multilingual model that also takes into account emojis (Barbieri et al., 2022). Longer posts tend to elicit more interactions, while posts with strongly negative or positive tones tend to have a greater impact on user reactions (Eberl et al., 2020; Koc-Michalska et al., 2021). Equally, longer posts might suggest higher levels of information.

Table 2.1: Operationalisation of all features *(developed by author)*

Concept	**Operationalisation**	**Feature**	**Example**
		Government Logic	
Transparency	Complexity of language used	Readability: LIX	"I am simply so happy that the pension funds are in the climate fight. That's well done. And absolutely important. We need to have everyone involved if we are to handle the climate challenges?" (mettefrederiksen.dk, 23.09.19) - 28 => 2nd Grade
	Government activities	Action Orientation (verb-to-noun ratio)	"Mo's 26 and has built a social enterprise to keep young people away from gang culture and educate them about climate change. Clime-it Brothers LTD If you've got an idea to support your community get started here: https://www.the-sse.org/" (10downingstreet, 12.08.2015) => Ratio: 0.4
		links to external web pages	"The PM spoke at the #LeaveNoOneBehind event in New York at the weekend. The panel discussed the 2030 Sustainable Development Agenda adopted by world leaders this week. More info: https://www.gov.uk/government/news/prime-minister-at-un-general-assembly-2015" (10downingstreet, 29.09.15)

Symbolism	Mentions of summits or meetings		"Brussels right now. Meeting of Renew Europe leaders" (AndrejBabis, 17.10.19)
	Self-referential language	1st Person Singular / Plural	"PM: I've just chaired a COBR meeting on the unprecedented flooding. Huge thanks to the emergency services and military for doing so much. My sympathy for those affected at this time of year. More troops are being deployed as part of a plan to do whatever is needed." (10downingstreet, 27.12.15)
	Ceremonial Language	expression of condolences or congratulations	"My congratulations to Christiana Figueres, distinguished and leading worldwide in the fight against climate change, for its award as "Lady of the excellent order of the British Empire" by Queen Elizabeth II. Christiana, you are an example for the entire. That pride! The Royal Family" (carlosalvaradoquesada, 23.04.22)
Social Media Logic			
Digital Infrastructure	Consistency of communication	frequency of posts	10downingstreet: post on environmental issues on average every 13 days
	Multimodality	Type of content	e.g. Photo, Link, Video
	Style of communication	post length	length of characters
		tonality	"Great news for the fight against climate change. http://ofa.bo/g8Qe" (barackobama, 16.06.15) => positive
Climate Logic			
Vulnerability	Climate vulnerability of countries	Vulnerability Index	Norway: 0.262
	Climate resilience (economic spending)	Environmental Protection Expenditure (% of GDP)	Australia 2021: 0.85%
Ideology	Ideology of Government	Left-Right Placement of party	4.175 (SebastianPineraPresidente)
		Pro-Environment Score	3.132 (SebastianPineraPresidente)

2.4.3 Communication Engagement Metrics

The second part of the analysis investigates how the communication patterns affect Facebook users' engagement. Government communication on social media is primarily supposed to enhance citizen engagement, access, and social inclusion. Unlike traditional channels such as

press releases or conferences, social media offers governments a direct way to reach a broader audience without gatekeepers such as journalists (Mergel, 2013a). This external-facing approach underscores the platform's role in fostering interaction between governments and citizens (Criado et al., 2013).

While transparency and other democratic goals are part of government communication, they are not exclusive to social media and can be pursued through alternative means. Engagement, however, remains a core objective – though governments might also seek to limit interactions when addressing unfavourable topics. Engagement is measured through interactions provided by Facebook, including reactions, comments, and shares, which indicate responsiveness to a post (Stromer-Galley, 2000). Even if direct exchanges between citizens and political actors remain limited, interactions can shape perceptions of political participation and strengthen government-citizen relations (Heiss et al., 2019; Knoll et al., 2020). Moreover, higher interaction levels may advance democratic goals like transparency and awareness (OECD, 2021a). In this study, I focus on interactions as well as the disaggregated measures of positive and negative interactions, as well as comments and shares.

2.5 Identification of Patterns in Government Communication

To begin with, I converted all concepts into numerical indicators as shown in Table 2.1. Using a combination of principal component analysis (PCA) and hierarchical clustering, I identify communication clusters related to environmental communication. First, the PCA identifies key dimensions that explain the underlying structure of government communication and reduce noise. To capture the most significant patterns in the data, I include all dimensions with an eigenvalue higher than 1, resulting in six dimensions. As a second step, to derive clusters from the PCA model, I then apply hierarchical clustering to the principal components, resulting in three clusters. The number of clusters is determined based on the level of gain in inertia (Husson et al., 2010). Table 2.2 provides an overview of the clusters along with examples. A more detailed description of the clusters can be found in Table A.2 in the Appendix.

Table 2.2: Cluster overview

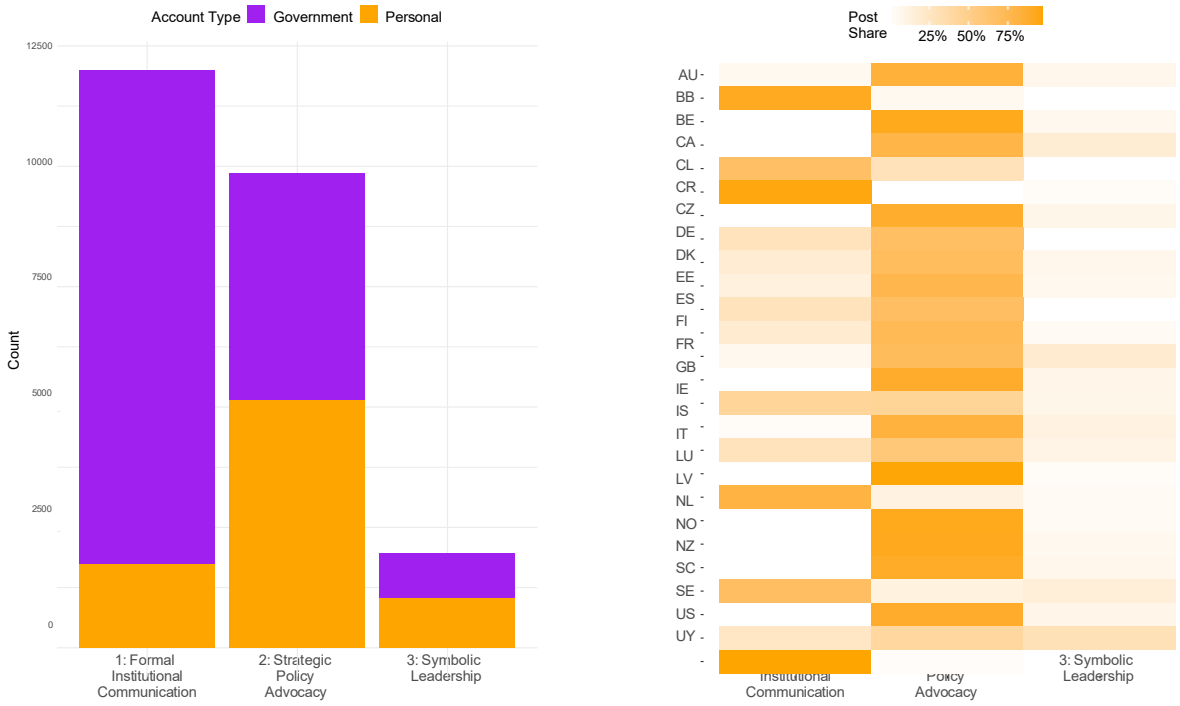
Cluster	Summary	Example
Cluster 1: Formal Institutional Communication	Accounts from more vulnerable countries with little expenditure on environmental protection, using shorter, but complex, negative and multimodal posts with reference links, lower intervals between posts, and less symbolic language	"Taking into account various global disasters and climate change, the new civil defense plan has changed the approach to risk assessment and management measures planning, emphasizing preventive and preparedness measures to be implemented by the service." (valdibasmaja, 2020-08-25)
Cluster 2: Strategic Policy Advocacy	Higher levels of environmental protection expenditure and left-leaning pro-environmental actors, longer and positive posts that are action-oriented with summit mentions, self-references and multimodality, more simple language and less climate vulnerable countries	"Today there is an end to nuclear power in Germany. Social Democrats have been campaigning for this for decades. Nuclear energy poses major technological risks and causes gigantic follow-up costs for society as a whole. I am convinced that the future belongs to renewable energies - which is why we are investing all of our energy in them. With Germany's new pace, we are igniting the energy transition, protecting our climate and thus securing the basis of life for future generations. #Nuclear exit #Germany's pace #Energy transition #climate protection" (olafscholz, 2023-04-15)
Cluster 3: Symbolic Leadership	Longer but easier to read posts with high ceremonial language, action oriented and self-references, countries with more environmental expenditure and less vulnerability, little multimodality	"I'm on my way to Idaho and California to survey the damage from recent wildfires and meet with local officials. I'll discuss our response to severe wildfires, and how we can make our nation more resilient to climate change and extreme weather" (POTUS, 2021-09-13)

The three identified clusters confirm that governments' social media communication on environmental issues is shaped by platform, issue, and actor logics. The largest, Cluster 1 – *Formal Institutional Communication*, is defined by platform affordances, environmental characteristics, and governmental aspects like transparent language. These posts are short, complex, and multimodal, with a more negative tone. It comprises governments in climate-vulnerable countries that post more frequently on environmental issues, often including reference links, which aligns with research showing a link between climate vulnerability and environmental communication (Boussalis et al., 2018). However, these posts tend to stem from countries with lower *Environmental Protection Expenditures*. This means that frequent communication does not necessarily translate to a greater financial commitment to effective environmental policy implementation.

This potential disconnect between communication and policy implementation or expenditure may be mediated by the resource constraints faced by vulnerable countries. These cases might strategically employ frequent environmental communications to signal concerns to an international audience, thereby seeking potential funding sources. Barbados exemplifies this dynamic. As a highly vulnerable country whose governmental communications predominantly fall into Cluster 1 (see Figure 2.4b in the Appendix), it struggles with significant challenges in climate adaptation investments due to its ongoing debt crisis. Nevertheless, the country has successfully established robust partnerships with international organisations whilst remaining a vocal advocate for climate justice (IDB, 2024; UNEP, 2024). Countries in this cluster, such as Costa Rica, also often navigate tensions between sustainability and economic growth objectives, attempting to balance funding requirements with the protection of national resources (The Guardian, 2024). Such frequent communication on environmental issues may therefore serve dual purposes: appealing to international stakeholders whilst simultaneously addressing domestic public audiences.

Politically, actors in this cluster hold less supportive environmental positions, as indicated by a lower *Pro-Environment* score compared to the average, while *Left-Right Placement* plays a minimal role, with only a slight tendency towards right-leaning accounts. The posts exhibit a negative *Action Orientation*, indicating a descriptive or technocratic communication style,

Figure 2.4: Cluster Visualization



(a) Cluster distribution across account type.

(b) Cluster distribution across countries.

reinforced by the dominance of official government accounts as seen in Figure 2.4a. This aligns with prior findings on supranational actors' nominal communication styles (Özdemir & Rauh, 2022) and resembles the 'customer service' approach described by Wukich (2022), where governments promote their services. Contrary to expectations, this cluster contains little symbolic or ceremonial language, further emphasising its formal and descriptive nature.

Cluster 2, titled *Strategic Policy Advocacy*, consists of actors who are generally in favour of environmental protection. The accounts tend to come from countries with lower Climate Vulnerability but nonetheless have significantly higher levels of Expenditure on Environmental Protection than average, such as New Zealand or Norway. This partially confirms my expectation of governments needing to address environmental issues if they have high spending; however, counterintuitively, posts are more infrequent than the average. The posts in the cluster contain more self-references, are longer but more simplistic, multimodal posts. Similarly to the previous cluster, Left-Right Placement only plays a moderate role with a tendency towards more left-leaning actors for this cluster.

Compared to the previous cluster, Cluster 2 appears to be less focused on descriptive and informative communication but instead advocates for aspects of environmental issues. This is supported by the higher levels of *Action Orientation* and *Self- References*, but also the general positive *Tonality*. In addition, this cluster contains an equal share of personal HoG accounts and official government accounts. In general, this cluster contains several characteristics of persuasive rhetoric with favourable presentation.

The last Cluster, *Symbolic Leadership*, is the smallest. The posts contain strong *Ceremonial Language* and *Self-References*, as well as simpler and action-oriented language. The actors in this cluster tend to come from countries that spend more on environmental protection despite lower levels of *Climate Vulnerability*. They are generally more left-leaning and in favour of environmental protection, but again the effect is slight with high deviations (the standard deviation is 1.14 and 0.96 respectively). Moreover, compared to previous clusters, external features related to the logic of environment, such as vulnerability, play a lesser role, while symbolic features are more relevant. The high level of symbolism in this cluster aligns with my expectation that personal accounts use a communication style similar to marketing methods, highlighting the importance of self-promotion in political communication (DePaula et al., 2018). Personal accounts use highly action-oriented and symbolic language to portray themselves as competent leaders and to inform citizens in detail about their activities and public services, while governments rely on more formalised language.

In conclusion, these clusters illustrate that while the left-right orientation appears to play some role, it does not seem to critically alter the clusters, which is also shown more clearly in Table A.2 in the Appendix. Instead, communication is structured along text-specific elements related to the logic of actor and the logic of issue, including external factors such as *Climate Vulnerability*. Another important finding involves the inconsistency of features related to the logic of government, namely transparency and symbolism. Although Clusters 2 and 3 show higher levels of *Self-References*, *Ceremonial Language* can only be found in Cluster 3. Cluster 1, on the other hand, contains a relatively complex language and shows a higher use of External Links, but no symbolic language. This emphasises the variety of messages that government actors convey. Communication seems to be tailored towards distinct roles, with official gov-

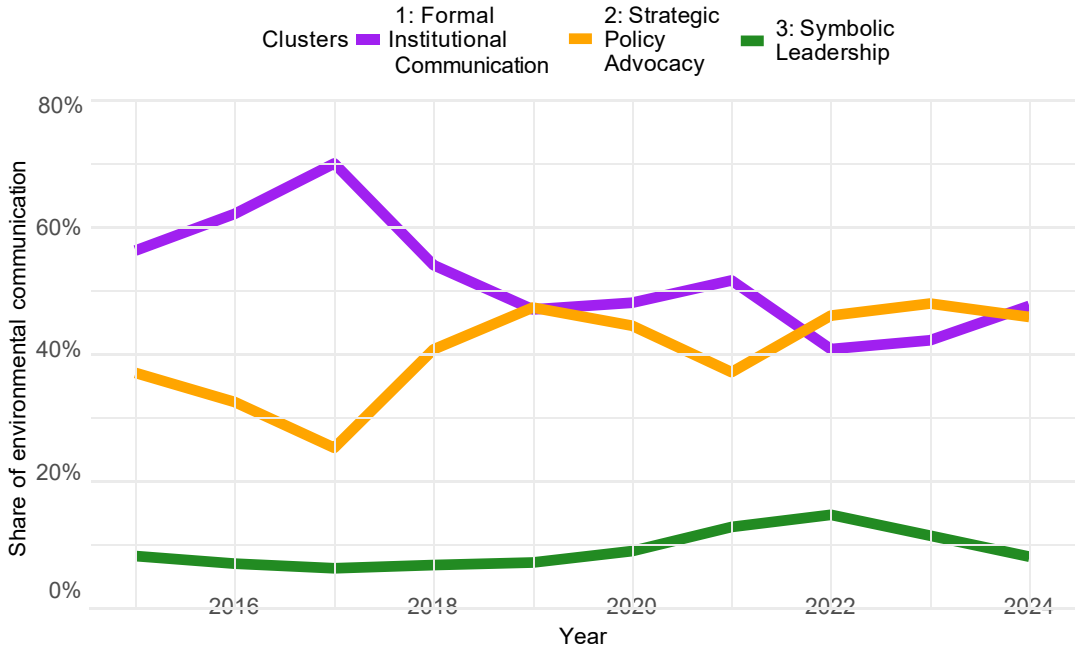


Figure 2.5: Cluster distribution across time.

ernment accounts following more formal communication, which is less of interest for personal accounts.

In addition, it should be noted that these communication styles are not consistent over the years, as shown in Figure 2.5. Although initially, Cluster 1 - *Formal Institutional Communication* dominated environmental messages by governments, its share has decreased to equal levels with Cluster 2 - *Strategic Policy Advocacy* in recent years. Cluster 3 remains mostly consistent below 10% with an increase in 2022. Finally, we can also observe variations at the country level in the cluster distribution. As illustrated in Figure 2.4b, while most countries rely on Cluster 2, several others, such as Italy or the United States, employ a variety of styles. This extends previous research showing that communication differs not only between different government departments (DePaula et al., 2018), but also within a government account.

2.6 Public Engagement with Communication Patterns

The final step of the analysis examines user engagement across communication clusters. As discussed previously, engagement is measured by the total number of *Interactions*, as shown

in Model 1. To provide a more nuanced understanding, *Interactions* are further disaggregated into *Positive Interactions*, which include reactions such as 'love', 'haha', 'wow', or 'care', and *Negative Interactions*, including 'sad' or 'angry'. Additionally, a separate model evaluates the impact of communication clusters on more complex interactions such as *Comments and Shares*. All have been logarithmically transformed due to their skewness. Accounting for country and year variation using fixed effects, I employ a Poisson model as the dependent variables consist of counts, such as the number of interactions. The main independent variable is the cluster variable with three categories, indicating to which of the clusters a post belongs. Cluster 1 (*Formal Institutional Communication*) serves as the baseline category. I also control for the number of followers at the time of posting and whether the post belongs to a Personal Account (1) or not (0). Table 2.3 reports the regression results.

Table 2.3: Poisson regression results of communication clusters across types of interaction.

Dependent Variables:	Total Interactions (log)	Positive Interactions (log)	Negative Interactions (log)	Comments & Shares (log)
Model:	(1)	(2)	(3)	(4)
Variables				
Cluster 2	0.02*	0.04***	-0.03	0.00
	(0.01)	(0.01)	(0.05)	(0.02)
Cluster 3	0.03**	0.04***	0.04	0.01
	(0.01)	(0.01)	(0.10)	(0.01)
Followers at Posting (log)	0.07***	0.08***	0.22***	0.09***
	(0.02)	(0.02)	(0.06)	(0.03)
Personal Account	0.33***	0.36***	0.68***	0.38***
	(0.04)	(0.05)	(0.13)	(0.05)
Fixed-effects				
Country	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Fit statistics				
Observations	15,390	15,390	15,390	15,390
Squared Correlation	0.81	0.82	0.63	0.75
Pseudo R^2	0.15	0.18	0.34	0.18
BIC	56,935.5	55,601.9	37,978.6	54,570.7

Baseline: Cluster 1 - Formal Institutional Communication
Clustered (Country) standard-errors in parentheses
** p < 0.05, ** p < 0.01, *** p < 0.001*

Model 1 examines the relationship between clusters and the total amount of *Interactions*. Clusters 2 and 3 have a statistically significant positive impact on total engagement. That is,

a post falling into Cluster 2 receives 2.02% more interactions ($(e^{\beta} - 1) \times 100$) than Cluster 1. Similarly, Cluster 3 receives a slightly higher increase in total interactions. Both *Followers at Posting* and the use of a *Personal Account* also significantly increase the total amount of interactions, with posts from personal accounts having the largest effect on *Interactions*. This pattern underscores the importance of not only the type of account and the reach of the audience, but also the type of communication in driving overall engagement. In other words, it indicates a lack of engagement with official and more technocratic government accounts, replicating findings on institutional accounts compared to personal ones for the European Union and the United Kingdom (Özdemir & Rauh, 2022).

When disaggregating the interactions, Model 2 shows that the clusters' significance on interaction is driven by positive interactions. It reveals that both Cluster 2 (*Strategic Policy Advocacy*) and Cluster 3 (*Symbolic Leadership*) significantly increase positive engagement compared to Cluster 1 (*Formal Institutional Communication*). This suggests that more symbolic and action-oriented communication styles resonate positively with audiences compared to informational ones. This finding is aligned with DePaula and Dincelli's (2018) results on US local governments, arguing that the affective nature of social media behaviour underlies citizens' tendency towards symbolic instead of informational content. Alternatively, it could also be a result of citizens being more likely to appreciate pro-environmental and leftist actors when they are addressing environmental issues.

Models 3 (*Negative Interactions*) and 4 (*Comments and Shares*) show no significant effect of any cluster on user engagement, suggesting that the communication patterns do not directly influence written responses, content sharing, or negative interactions. One explanation could be that these forms of engagement require more effort and reflection, making them less likely. In contrast, simply clicking 'like' remains the easiest option for users. The statistical significance of *Followers at Posting* aligns with previous research, which found that past interactions strongly predict future engagement (Koc-Michalska et al., 2021).

Considering that most government accounts can be placed in Cluster 1, which resembles customer service language and descriptive and technocratic communication, these findings raise important implications. It appears that normative democratic ideals of transparent govern-

ment communication do not resonate strongly with citizens; or at least, the way such communication is presented does not result in much engagement. However, low engagement metrics may also represent a deliberate communication strategy, particularly for governments that are obliged to disclose information on policies but might prefer to obfuscate or blur contentious issues. In general, the results highlight the importance of tailored communication strategies on social media, where the choice of communication style can significantly shape public engagement.

2.7 Conclusion

In this study, I develop indicators to measure governments' social media communication patterns based on three logics of social media communication and their interaction: platform, issue, and actor. Using clustering techniques, I demonstrate that governments over the last 10 years have employed three distinct communication styles – Formal Institutional Communication, Strategic Policy Advocacy, and Symbolic Leadership – each influenced by factors related to the different logics of social media communication. I find that these distinct communication styles have a significant impact on Facebook interactions, particularly on the probability of positive user engagement.

The findings reveal a nuanced relationship between the three logics in influencing social media communication styles and engagement outcomes, as well as insights into how governments communicate environmental topics. Interestingly, the communication styles uncovered were less specific to environmental issues and ideology and more indicative of general communication patterns. In other words, the identified clusters differ stylistically from each other rather than substantively. The left-right positioning also played a relatively minor role in shaping these patterns. This further underscores previous research that it is not the left-right positions explaining variations in environmental issues or, more specifically, climate change (Huber, 2020; Lockwood, 2018). It also suggests that environmental topics might still function as a valence issue for governments, which can differ for other central political actors, such as parties or politicians. Regardless of party positions, governments must address environmental policies

or natural disasters, making substantive divergence less likely.

Lastly, I demonstrated that communication styles influence user engagement on social media, although their effects vary between engagement metrics. Addressing key questions raised by DePaula et al. (2018), my findings suggest that social media users prefer symbolic acts over mere information provision. In particular, positive interactions are significantly shaped by the type of communication. Posts categorised as *Formal Institutional Communication*, typically from government accounts, generate fewer positive interactions. This indicates that citizens are less engaged with service statements and descriptive or technocratic updates about government activities. Instead, they respond more to the action-oriented, self-referential, and simplified language used in other clusters. This has important implications, as social media engagement expands the communication reach through the platform's social graph structure (Newman et al., 2024). If governments seek to maximise audience exposure for informational and service-related posts, they may need a different communication strategy. In accordance with similar previous suggestions by DePaula and Dincelli (2018), Mergel (2013b), and Zavattaro et al. (2015), I argue that understanding these dynamics is crucial for government professionals, particularly to ensure the effective dissemination of critical information during natural disasters and fostering an informed citizenry.

Considering that this study focused specifically on environmental issues and the climate crisis, further research should address whether other policy issues show similar communication and engagement patterns. While environmental communication has very distinct aspects considering the role of the climate crisis as a long-term creeping crisis, the finding that the communication patterns seem to be driven by institutional and platform factors rather than by the specific content or ideology of environmental issues suggests potential external validity. The patterns found in this study might apply particularly to policy areas with similar characteristics such as public health communication. In contrast, I would expect less generalisability to more polarised policy domains such as immigration.

Finally, there are also limitations to these findings. Although the regression results demonstrate a significant association between the clusters and user engagement metrics, these findings warrant caution in their interpretation regarding causality. While some clusters may generate

more engagement as hypothesised and supported by previous literature (DePaula & Dincelli, 2018), another possibility could be reverse causality, with governments adjusting their communication output according to observed engagement patterns and essentially creating a feedback loop. Furthermore, unmeasured confounding variables could affect both the clusters and the engagement metrics. These could be additional indicators for my conceptual framework of interconnected logics or specific environmental topics that might prompt a specific kind of government communication as well as higher levels of user reactions. A combination of qualitative (e.g., interviews with communication strategists) and quantitative (e.g., quasi-experimental designs) methods would help to further shed light on the specific causal direction of communication outputs and engagement patterns.

Another limitation refers to selection bias and the specific architecture of Facebook. Facebook's algorithm has undergone frequent and often opaque changes over the years, complicating the interpretation of engagement results. Furthermore, these findings may not be generalisable to other platforms. For example, while X shares structural similarities with Facebook, its distinct digital architecture could yield significant differences in both communication styles and user engagement. Further research should address these limitations and explore additional contextual factors that may influence communication patterns. Specifically, the role of media coverage and political dynamics requires greater attention, as public issue priorities often drive agenda setting (Barberá et al., 2019), which I will further address in Chapter 4. Additionally, future studies should examine how government communication styles evolve over time, particularly whether there is evidence of 'learning' in adapting to the affordances of social media platforms.

Chapter 3

Shifting Agendas in Crisis: How German Parties Communicate Across Communication Channels After Russia's Invasion

3.1 Crisis Events and Political Agenda Transformation

After examining the patterns of communication on social media, this chapter addresses how the communication on such platforms can be disrupted. Crises and unexpected events have long been recognised as critical moments that disrupt political landscapes, challenge the status quo, and open windows for opportunistic and defensive manoeuvres by political actors (Alink et al., 2001; Boin et al., 2009; Kingdon & Stano, 1984). While traditional research has examined how such events influence policy shifts and public opinion in mass media or plenary arenas, less attention has been paid to what Praet et al. (2021, p. 196) calls the "raw matter of politics": issues themselves. The issues that parties emphasise are central to political conflict and represent one of the most important sources of political power (Green-Pedersen & Walgrave, 2014; Schattschneider, 1960). Crisis events significantly affect such issue agendas, as parties engage in framing contests to dominate the narrative (Alink et al., 2001; Boin et al., 2009; Keeler, 1993). This competition in meaning-making directly influences both voting decisions (Alvarez & Nagler, 1995) and broader public discourse (Green-Pedersen, 2007). Furthermore, today's hybrid political media environment has created multiple communication arenas with parallel

issue agendas (Ivanusch, 2025), thereby increasing opportunities for framing contests and the shaping of public discourse.

Despite the recognition of the growing importance of social media in political competition and agenda-setting (Ivanusch, 2025; Langer & Gruber, 2021), little attention has been paid to how crisis events influence the agenda competition of parties on offline and online communication channels. Unlike traditional arenas, where institutional norms structure political discourse, social media platforms provide parties with more flexible and immediate means of shaping public narratives (Peeters et al., 2019; Popa et al., 2020). At the same time, parties' issue attention on social media can shape the attitudes of voters and influence media reporting. The mere frequency of a policy issue can have lasting effects through incidental exposure or users' direct engagement (Bode, 2016; Popa et al., 2020). By reinforcing specific framings of policy issues through frequent repetition or avoidance of such issues, parties shape how the public perceives them and potentially related crisis events.

This chapter delves deeper into the question of how crisis events affect parties' issue attention across different communication channels. More precisely, if and how they disrupt parties' agendas. Previous (comparative) research has often focused only on one communication arena or an electoral context (Elmelund-Præstekær, 2011; Meyer & Wagner, 2014; Norris et al., 1999; Van Assche, 2012). However, with today's hybrid communication environment, which has further fostered an environment of permanent campaign (Blumenthal, 1980; Larsson, 2016), such isolated perspectives can divert from the variation of parties' agendas and their distinct impacts, particularly during critical events. Understanding how parties adjust their communication to unforeseen events in different channels is essential to understanding shifts in party competition and the handling of crises in contemporary democracies. It also has implications for how the public reacts to these events, addressing questions of accountability and transparency. The latter will be addressed in Chapter 4.

This chapter seeks to contribute to the literature on agenda-setting and party competition

by analysing how a critical event affects agenda diversity of German parties' communication in online and offline channels: in Facebook posts and in parliamentary speeches, respectively. I use Russia's full-scale invasion of Ukraine as a focusing event (Alexandrova, 2015; Birkland, 1998). As this study emphasises immediate and short-term effects, the time period covers a window of three months before and after the invasion. A BERT classifier trained on the Manifesto Project code (Burst et al., 2024; Lehmann et al., 2024) provides the basis for measuring agenda diversity, operationalised as the exponential Shannon's extropy measure for a given week, for each communication channel and party, covering more than 5,000 text documents.

The findings reveal nuanced patterns of crisis communication: while the invasion generally increased agenda diversity, this effect varied significantly by communication platform and party status. In parliamentary settings, both governing and opposition parties expanded their issue agendas equally following the invasion, possibly reflecting the consensual style of the German Bundestag, which limits governing parties' agenda control, as well as the constraints of the legislative agendas (Proksch & Slapin, 2014; Sieberer, 2006). However, on Facebook, a more asymmetric pattern emerged, where opposition parties significantly broadened their agenda diversity after the invasion, trying to navigate the new issue landscape and potentially exploiting the crisis as an 'opportunity window' (Kingdon & Stano, 1984), while government parties maintained stable agenda diversity without significant change. This disparity suggests that opposition parties are able to strategically leverage social media platforms during crises to address a wider range of issues, while government parties maintain more consistent messaging across channels, likely focusing on demonstrating competence and building public trust through careful issue management.

The chapter begins by examining the literature on agenda-setting during crises and across various media channels. Based on this theoretical foundation, I present three hypotheses. I continue by outlining the research design, detailing the selected case study and the methodological approach used. The analysis is presented in two parts: first, a descriptive examination of how political parties construct their agendas across different communication channels; second, an investigation into how these channels and the parties' political status influence agenda diversity. The chapter concludes with a summary of key findings and their implications.

3.2 Perspectives on Agenda-Setting

The study of political communication has long examined how parties strategically emphasise and de-emphasise issues across different platforms. While early research suggested a stable agenda with incremental adjustments, such periods of stability and inertia can also be punctuated by episodes of rapid and dramatic change before returning to a stable trajectory (Baumgartner & Jones, 1993; Richardson & Jordan, 1979). Scholars have found a multitude of agenda expansion causes, such as a redefinition of policy issues, changes in voters' issue priorities, or niche parties that force certain issues onto the agenda or break down policy monopolies (Abou-Chadi, 2016; Baumgartner et al., 2023; John & Jennings, 2010; Meguid, 2005; Spoon & Klüver, 2014).

Agenda-setting theory (McCombs & Shaw, 1972) has been central to this discussion, initially focusing on how the media influences public perceptions of the importance of issues. Translating this into party competition, political agenda-setting raises the question of how parties allocate their limited attention to policy issues to signal preferences to their voters and how these policy agendas are formed (Froio et al., 2017; Green-Pedersen, 2019b; Jones & Baumgartner, 2005). Parties need to find a balance between their preferred issues and those that are important to the public or media (Druckman et al., 2010; Petrocik, 1996). Overall, agenda-setting processes do not just reflect party agendas, but actively structure party competition, influencing which topics dominate political debates and which remain marginalised.

While legacy media has played a key role in shaping political discourse and studies of agenda-setting, the rise of digital platforms has introduced new dynamics by further diversifying the opportunities for parties to directly address voters and by providing greater flexibility in communication, such as in the case of issue attention (Peeters et al., 2019; Popa et al., 2020). Political actors now must navigate a hybrid media environment in which agenda-setting occurs in both structured and unstructured arenas. This also affects parties' ability to address different topics as they are more likely to be subject to issue trespassing or exogenous shocks in the highly flexible digital environment (Ceron et al., 2022; Chadwick, 2017; Ivanusch, 2024; Mergel, 2013b; Tresch et al., 2015). In other words, digital platforms have introduced new

opportunities to engage with or avoid policy issues.

Despite substantial research on agenda-setting, gaps remain in understanding how unexpected crises affect party communication across these different channels. Crises serve as critical junctures in political competition with strong agenda-setting effects, disrupting political communication by forcing parties to shift their focus and potentially exploit new openings (Alink et al., 2001; Boin et al., 2009). Although this provides political opportunities for parties to challenge established policies and dominate narratives (Keeler, 1993), its extent is also restricted by the respective institutional setting. Traditional communication, such as in parliaments, tends to reflect structured priorities (Proksch & Slapin, 2014), whereas social media platforms provide a more dynamic and reactive space for political messages (Ivanusch, 2025; Peeters et al., 2019; Popa et al., 2020). These differences can affect parties' strategic communication. However, the ways in which crises disrupt issue attention and how parties exploit them and adjust their communication strategies across different media remain an open question.

This question is particularly relevant given the increasing role of social media in shaping public opinion. Social media has become a crucial tool for parties in shaping political discourse, allowing direct and unfiltered communication with the public (Peeters et al., 2019; Popa et al., 2020), and enabling parties to rapidly change narratives in response to public opinion or news (Bode et al., 2011). This matters particularly during crises when parties engage in the construction of contests, strategically shaping how crises are interpreted (Cmeciu & Coman, 2018; Procopio & Procopio, 2007). In other words, the way parties change their agenda can influence how citizens perceive crises. Furthermore, the increased speed of information flow during crises intensifies the role of social media in defining the political agenda. Overall, in order to understand agenda-setting, it has become essential to include not only traditional channels of communication but also online dynamics (Langer & Gruber, 2021). Considering that issue attention represents a key aspect for political change and therefore is essential for the strategic considerations of parties (Boydstun et al., 2014), this study is an attempt to bridge the literature on issue attention and agenda-setting with social media behaviour of political parties.

In conclusion, addressing these gaps and better understanding parties' issue priorities in social media environments is crucial for understanding the evolving nature of political com-

munication. Disruptive events provide ample opportunities for parties to shape the public's perception of a crisis or a policy issue and to highlight their own competence or blur their responsibility. As crises continue to disrupt the political landscape, examining how parties navigate these challenges and opportunities across different communication platforms will shed light on broader patterns of agenda-setting, responsiveness, and political strategy. The interaction between traditional and digital political communication channels underscores the need for a more nuanced approach to studying how parties navigate crises and adapt their communication strategies over time. This chapter addresses the question of *how do crises affect political parties' issue diversity and communication strategies across online and offline media platforms*.

3.3 Agenda-Setting across Media Arenas

Political communication focuses on different goals such as legitimising actions, promoting core values, or generating broader support for political measures (Callaghan & Schnell, 2005; Schmid-Petri, 2012). In this context, the political agenda of parties plays an important role as it represents "the list of issues to which the political actors pay attention" (Walgrave et al., 2008, p. 815). In general, parties' agendas and issue emphases are relatively consistent despite pressure from other parties (Baumgartner & Jones, 1993; Green-Pedersen & Mortensen, 2010). However, parties also face strong incentives to respond to the public in their communication (Stimson et al., 1995) and act accordingly. For example, this behaviour can be observed in campaign manifestos in which parties adjust their issue attention to the severity of societal problems, reflecting occurrences of the real world such as economic struggles (Spoon et al., 2014) or the increase in immigration (Green-Pedersen & Otjes, 2019). Particularly in the case of a negative problem development, parties diverge from favoured issues and address the problem itself (Kristensen et al., 2022). Hence, crisis events represent a key aspect of agenda adjustment, as they represent turning points in the political process (Stevens & Vaughan-Williams, 2016) and have the potential to disrupt agendas in the long run.

A reason for extraordinary and critical events' disruptive potential for parties' agendas is

that they create moments of heightened uncertainty and public scrutiny, requiring political actors to engage with relevant policy issues to maintain legitimacy and control narratives (Boin et al., 2009). Crisis communication theory suggests that political actors engage in sense-making, decision-making, and meaning-making when responding to crises, which shapes communication across different arenas (Coombs, 2007). Such 'focusing events' are characterised by their "suddenness, rarity, overall unexpectedness and some sort of effective or implied harm" (Alexandrova, 2015, p. 507). They are particularly important to the political landscape, as they can challenge the status quo and force parties to react (Jones & Baumgartner, 2005). Creating both possibilities for political actors to prove themselves and opportunities for political change in case of government failure (Boin et al., 2009), such events require either strategic redesign or materialise in new priorities (Sides, 2006). Parties can exploit these events as a 'window of opportunity' (Kingdon & Stano, 1984), which can result in significant changes to their agendas.

Research in this area has shown that extraordinary events can act as a reinforcement mechanism of issue engagement but also increase issue avoidance depending on how parties relate to the respective event and connected policy issues (Baumgartner & Jones, 1993). An example is how after the terrorist attacks of September 11 in the United States, politicians reshuffled their issue attention, paying more attention to defence and terrorism (Sides, 2006). Even when parties have strong issue ownerships, events with greater problem severity, such as crises, increase the issue overlap of parties and compel them to consistently address issues beyond those they own and thus change their issue attention (Kristensen et al., 2022; Seeberg, 2023). Moreover, parties may need to redesign their communication strategy, which is not an immediate process.

In the meantime, parties continue with their previous issues such as specific policies or bill proposals in the parliament that need to be addressed and incorporate new pressing issues into the existing agenda.

> H1: Crises lead to an increase in agenda diversity in political communication as parties incorporate crisis-related topics while maintaining attention to their pre-existing agenda items.

Another important factor for shifts in communication strategy and political agendas are institutions that shape the communication ecosystem within which parties act (Green-Pedersen &

Walgrave, 2014). Political actors operate in different communication environments, each with varying levels of control and audience (Benoit et al., 2011; Elmelund-Præstekær, 2011; Norris et al., 1999). Despite parallel hybrid media environments (Ivanusch, 2025), different channels of communication have distinct characteristics that can lead to variation in parties' communication. Furthermore, the agendas of parties have become more dissimilar across different channels of communication (Elmelund-Præstekær, 2011) as the logic of the media redefines how parties communicate politics, potentially depending on the demands of the media and the public (Chadwick, 2017; Mazzoleni & Schulz, 1999). Therefore, in the following section, I argue that despite a general increase in diversity, the effect of a crisis on parties' agendas also differs depending on the media channel and manifests in different ways.

Parties' communication within traditional communication arenas follows specific rules that define the scope of their issue attention (Green-Pedersen & Walgrave, 2014). For example, parliamentary speeches are structured and often influenced by formal legislative procedures (Proksch & Slapin, 2014), whereas party manifestos resemble more the ideal agenda of parties, namely the general importance of individual issues for the respective party (Norris et al., 1999). Furthermore, even though citizens have access to party communication in these institutions, parliamentary speeches or party manifestos are mostly aimed towards internal audiences, the media, or other parliamentarians (Elmelund-Præstekær, 2011). The institutionalised nature of these communication arenas introduces a degree of inertia, meaning that changes in party agendas often occur incrementally rather than rapidly. Procedural constraints, established traditions, and strategic considerations make it difficult for parties to adjust their communication and issue emphasis quickly (Cox & McCubbins, 2005).

Social media, on the other hand, has triggered several changes to the communication strategies of political parties. Communication has become more dynamic, introducing the 'fourth phase of political campaigning' (Blumler, 2016; Roemmele & Gibson, 2020). Such online platforms allow for more spontaneous and reactive messages and enable political actors to directly address voters without gatekeepers (Peeters et al., 2019; Popa et al., 2020; Roemmele & Gibson, 2020). According to Chadwick's (2017) hybrid media systems framework, this creates distinct logics of communication where parties can pivot more rapidly to crisis response on

social media while institutional constraints slow adaptation in formal and traditional communication settings. Parties can therefore be more flexible in deciding which issues to address (Sides, 2006). Social media also allows for more strategic audience targeting, meaning that parties can communicate specific messages to distinct voter segments and address more diverse political interests while monitoring offline and online political debates (Elmelund-Præstekær, 2011; Roemmele & Gibson, 2020).

These developments have several implications for political agenda-setting on social media. Although politicians generally have strong incentives to respond to public opinion (Stimson et al., 1995), this is easier on social media than within the constraints of legislative speech. At the same time, this can also mean that policy issues are generally less relevant on social media compared to other channels. Van Dalen et al. (2015) found that Facebook communication, for instance, is more focused on mobilisation or relationship management than on policy issues. Social media provides a better opportunity for parties to engage with or attack political opponents than press releases or manifestos (Ivanusch, 2025). However, other research shows that parties focus their social media communication instead on a specific policy issue, often one they own (Blassnig et al., 2021). While it is not clear which issues dominate the social media agenda, parties appear to have more control over them and customise their agenda according to their preferences. Social media potentially also enables them to adjust more quickly to specific situations such as crises. Therefore, crises should show less of a disruption on agenda diversity on social media compared to parliamentary speeches, as they are immediately able to adjust and reshuffle their communication according to their preferences.

> H2: Crises trigger greater shifts in parties' agenda diversity in parliamentary settings than in social media communication channels.

Lastly, the status of a party plays an important role in how parties address policy issues and whether they avoid or reinforce them. More precisely, this decision is shaped by the institutional party status, whether the party is part of the government or the opposition (Cavalieri & Froio, 2022; Vliegenthart et al., 2013). For instance, not all parties have equal control over the legislative agenda, with governing parties often having greater agenda-setting power (Cox

& McCubbins, 2005; Döring, 1995). However, opposition parties have other means of 'forcing' governing parties to address certain issues (Green-Pedersen & Mortensen, 2010). Hence, differences in party status should also be reflected in agenda diversities.

Although governing parties have an interest in emphasising those issues for which they have an advantage, they also tend to be more constrained by institutional rules as they are often forced to respond to issues that arise on the agenda and that are linked to government responsibilities (Green-Pedersen & Mortensen, 2010; Klüver & Spoon, 2014). These parties need to balance the limited space of issue attention between their core institutional issues, such as government operations, and their preferred issues, related to their preferences such as issue ownership. They have to prioritise which issue to bring to the agenda when attention resources are finite (Jennings et al., 2011; Jones & Baumgartner, 2005). During a crisis, the demand for leadership increases as governing parties strive to signal competence and build public trust. Consequently, the attention they give to non-crisis issues diminishes, while issues addressing government responsibilities increase. Specifically, references to their own competence and major issues related to the crisis should increase. This leads to a more focused and less diverse set of issues on the agenda.

For opposition parties, I expect the opposite effect. Opposition parties often use crises to challenge the status quo, criticise the government, and present credible alternative proposals (Helms, 2008; Norton, 2008). While some crises result in strong 'rally the flag' effects (Ansolabehere & Iyengar, 1994) with opposition parties joining the government, this is rather exceptional and mostly occurs in cases of long-term national emergencies such as the COVID-19 crisis or direct threats to the country (Chowanietz, 2011; Louwerse et al., 2021). Other crises that, while disrupting the political landscape, do not threaten a country's interests (yet) should show a different behaviour of opposition parties. More precisely, I expect them to increase their issue diversity, as they challenge the government (Norton, 2008). They are also less constrained in what issues to address compared to governing parties. Therefore, they have the freedom to experiment with a variety of policy issues while adjusting rapidly to changes in public opinion if needed.

Social media I expect to further amplify these dynamics by facilitating the diversity of

communication issues, as parties seek to maximise their reach and resonance with different audiences (Blassnig et al., 2021). Furthermore, parties have more flexibility on social media in what to address and how to address it compared to parliamentary settings. Therefore, I would expect to see on Facebook opposition parties strongly increasing their agenda setting, whereas governing parties either remain consistent or decrease their issue attention. Finally, opposition parties should show an expansion of their agenda also in parliamentary settings as they also provide parties with the opportunity to directly address their opponents, potentially highlighting additional issue areas. This suggests that opposition parties are able to exploit crises to broaden their policy critiques, while incumbents will attempt to minimise deviations from their established agenda. However, while I expect the same pattern as for parliamentary settings, social media should show a stronger effect due to its greater flexibility.

> H3: Opposition parties expand their agenda diversity more than incumbents after crises, but this effect is stronger on social media than in parliamentary settings.

3.4 Research Design

3.4.1 Case Selection

The 2022 full-scale invasion of Ukraine by Russia represents an extraordinary event not only due to its geopolitical complexities and consistent uncertainty, but also due to its significant effect on German policymakers (Bunde, 2022). Moreover, Germany has been a central player in policy-making at the EU level since the start of the Russo-Ukrainian war in 2014. Furthermore, it has increasingly taken up a leadership position at this level, which also makes this a critical case for understanding how the conflict might have affected other European countries (Aggestam & Hyde-Price, 2020; Fix, 2018).

With the full-scale invasion by Russia, Germany witnessed three major shifts, dubbed 'Zeitenwende', a pivotal moment for its political landscape. First, German government and parties (for an overview see Figure 3.1) introduced a departure from longstanding foreign policy principles, including objections to weapon deliveries to conflict zones. Second, the German

Table 3.1: Overview of German parties in parliament at the time of Russia's full-scale invasion in 2022.

Party Name	Orientation	Party Status
The Left	Left	Opposition
B90/Greens	Ecological	Government
SPD	Social Democratic	Government
FDP	Liberal	Government
Union (CDU/CSU)	Conservative	Opposition
AfD	Right/Populist	Opposition

Bundestag allocated €100 billion to strengthen its military, a move supported by most factions. This decision marked a significant departure from earlier positions, especially for the Greens and the SPD (Deutscher Bundestag, 2022; Hofmann, 2021; Lindner & Özdemir, 2015; Parteivorstand SPD, 2021). Lastly, Germany made significant progress in reducing reliance on Russian energy sources, achieving near-zero dependence through diversification and expansion of renewable energy out of necessity. A transition that had previously faced resistance from both interest groups and the political establishment (Dempsey, 2023).

Furthermore, decades of close ties between Germany's and Russia's political and economic elite underwent a drastic transformation due to the invasion, leading to a re-evaluation of Germany's *Ostpolitik*. Although Germany previously promoted strategic ambiguity and plausible deniability, it had to change fundamental aspects of its foreign policy and its connections to other EU countries, especially in the East (Dempsey, 2023; Wood, 2021). The invasion also led to a re-examination of parties' stances concerning Russia, with the Alternative for Germany (AfD) and The Left standing out for their continuous pro-Russia positions. Although the continuation of close ties with Russia does not represent an exception among European far-left and far-right parties, this position nonetheless diverged from the broader German political landscape despite generally strong connections to Russia among the political landscape (Fagerholm, 2024; Onderco, 2019; Snegovaya, 2022). This shift sparked internal debates within parties and challenged traditional alliances, resulting in a crisis that impacted not only fundamental (foreign) policy elements but also internal party politics. Overall, although the full-scale invasion by Russia started out as a situational crisis with geopolitical shifts, it has turned into an institutional crisis, which is inherently political. This situation resulted in politicians becoming the

target of scrutiny and in a retrospective meaning-making contest with the potential to escalate the political stakes (Boin & 't Hart, 2000; Frandsen & Johansen, 2020).

3.4.2 Data

To address German parties' communication on social media, I focus on the full-scale Russian invasion of Ukraine on February 24, 2022, as a case study of German party communication. Since the invasion, this topic has been salient to the public, and it has also framed the perception of various other policy issues such as energy politics, immigration, or the economy (Graf, 2022). Therefore, one can assume that parties have started to compete on this issue and have a significant interest in communicating their position on this topic, also in the context of different policy issues.

I have selected two channels that represent the different communication arenas mentioned above. First, I am using Facebook data as a proxy for the social media channel. Compared to other social media platforms such as Twitter, Facebook remains a relatively understudied one, despite its preference by German parties (Fuchs & Motzkau, 2023). Moreover, Facebook users represent a broader population than Twitter, which is mainly used by academics, journalists, and the political elite in Germany (Hofmann et al., 2019). Second, the more traditional and offline communication arena is represented by parliamentary speeches. These speeches represent an important avenue for political actors to signal policy preferences and positions while communicating strategic considerations of party leaders (Martin & Vanberg, 2008; Proksch & Slapin, 2014). They therefore contain crisis-related issues and provide an important source to understand parties' issue competition and agenda diversity. In addition, they occur more frequently than manifestos, which allows for a better comparison with Facebook's longitudinal data.

Since I am interested in the immediate effects of the event on parties' agenda diversity, the corpus for the analysis covers all German parties within the window of three months before and after Russia's full-scale invasion of Ukraine. I use *CrowdTangle* prior to its closure to collect social media data from the official Facebook pages of parties and their parliamentary factions, as these also reflect national party agendas. The parliamentary data is based on the SpeakGer

dataset (Lange & Jentsch, 2024) after removing interpellations and non-policy-relevant content such as greetings.

3.4.3 Method

To determine the agenda of parties, I code each document – Facebook post or parliamentary speech – according to the classification provided by the Manifesto Project using the fine-tuned BERT model *manifestobert* (Burst et al., 2024), which has shown great performance in similar studies on party agendas (Ivanusch, 2025). This enables a better systematic classification of policy issues compared to other methods such as topic models. Overall, the data consists of 3,073 Facebook posts and 2,065 parliamentary speeches from German parties. I then group the Manifesto Project classification into broader categories, combining, for example, 'Foreign Special Relationships: Positive' and 'Foreign Special Relationships: Negative' into 'Foreign Affairs'. This ensures that I am not measuring parties' ideological policy positions but instead their attention to a policy issue (Green-Pedersen, 2019a). This leaves me with 18 different categories displayed in Table B.1 in the Appendix.

To measure my dependent variable – the agenda diversity of each party and communication channel – I use the exponentiated Shannon's Information Entropy Index (Shannon's H) as shown in Equation 3.1. This metric essentially captures the effective number of issues (ENI) and ranges from 1 to n, where n represents the total number of possible issues on an agenda. The exponentiated Shannon's entropy measure quantifies how parties distribute their attention across multiple parallel issues, effectively measuring agenda fractionalisation (Camargo et al., 2021). This approach is conceptually similar to Laakso and Taagepera's (1979) measure of the effective number of political parties, as both stem from ecological diversity indices. Alternative entropy measures that have been used in previous studies include the normalised entropy (Jennings et al., 2011; John & Jennings, 2010), which does not permit comparisons between agendas of different sizes (Boydstun et al., 2014), and the non-normalised entropy, which allows such comparisons but yields results without clear interpretation. My choice of using the exponentiated Shannon's entropy measure offers distinct advantages: it enables direct comparison of different agendas to actual numbers of issues and provides meaningful scores.

Specifically, a score of n indicates that attention is distributed nearly equally among n issues (Camargo et al., 2021).

$$ENI_t = \exp\left(-\sum_{i=1}^{n} p_t(x_i) \ln p_t(x_i)\right) \tag{3.1}$$

I calculate the exponentiated Shannon's entropy measure for each week t to ensure comparability of Facebook posts and parliamentary speeches, considering that the latter do not occur daily. In this context, x_i represents an individual issue, and $p_t(x_i)$ denotes the proportion of total attention that this issue receives within a specific week, party, and type of communication channel (Facebook or Parliament). The logarithmic function $\ln(p_t(x_i))$ represents the natural logarithm of this proportion, capturing the informational contribution of each issue. The variable n corresponds to the total number of unique issues present in that week.

My main independent variable is a binary variable that accounts for the impact of the invasion, *After Invasion*, which is coded as 1 for posts or speeches made after the invasion date, 24 February 2022, and 0 otherwise. The type of communication channel is captured by the variable *Parliament*, which takes the value of 1 for parliamentary speeches and 0 for Facebook posts. Additionally, to assess the effect of party status, I introduce the variable *Opposition*, which is coded as 1 if the party was in opposition at the time of the invasion (Union, AfD, Left) and 0 if it was a governing party (Greens, FDP, SPD).

To test the hypotheses, I employ an OLS regression with fixed effects for parties in the case of Models 1 and 2, whereas Model 3 contains no fixed effects. The inclusion of fixed effects in the first models serves to control for systematic variations across parties that may be influenced by external factors beyond the invasion itself, such as party size or ideology. This approach allows me to isolate the specific effects of the invasion on agenda-setting behaviour while accounting for party-specific heterogeneity.

While Model 1 presents the base model with only the variable *After Invasion*, Model 2 corresponds to the second hypothesis and, thus, introduces an interaction term between the invasion and the binary variable that indicates whether the communication channel in question is the Parliament or Facebook. Formally, the model is specified in Equation 3.2 where γ_i represents party fixed effects, and ε_{it} is the error term clustered by party.

$$\text{Agenda Diversity}_{it} = \beta_0 + \beta_1 \text{AfterInvasion}_t + \beta_2 \text{Parliament}_i + \beta_3(\text{AfterInvasion}_t \times \text{Parliament}_i) + \gamma_i + \varepsilon_{it} \tag{3.2}$$

The third model, formalised in Equation 3.3, further extends the analysis and addresses the third hypothesis by incorporating party status and additional interaction terms. In this specification, β_4 captures the baseline difference in agenda diversity for opposition and government parties, while β_5 and β_6 account for the conditional effects of party status and communication channel. The three-way interaction term (β_7) examines whether the effect of the invasion differs for opposition and government parties across communication channels, testing the final hypothesis. As mentioned before, this model does not include any fixed effects as I am interested in variations across parties, namely party status.

$$\begin{aligned}\text{Agenda Diversity}_{it} = {} & \beta_0 + \beta_1 \text{AfterInvasion}_t + \beta_2 \text{Parliament}_i + \\ & \beta_3(\text{AfterInvasion}_t \times \text{Parliament}_i) + \beta_4 \text{Opposition}_i + \\ & \beta_5(\text{AfterInvasion}_t \times \text{Opposition}_i) + \\ & \beta_6(\text{Parliament}_i \times \text{Opposition}_i) + \\ & \beta_7(\text{After Invasion}_t \times \text{Parliament}_i \times \text{Opposition}_i) + \varepsilon_{it}\end{aligned} \tag{3.3}$$

Given that all hypotheses involve interaction terms, I present relevant marginal effect estimates visually to facilitate interpretation, as the regression coefficients alone are not directly interpretable (Brambor et al., 2006). Hypothesis testing is conducted using the marginaleffects library (Arel-Bundock et al., 2024), which is displayed in Table 3.3.

3.5 Empirical Findings: Crisis-Induced Agenda Shifts

3.5.1 Descriptives

Figure 3.1 presents the distribution of agenda diversity across each party and communication channel type. While the graph does not provide any conclusive information on patterns of agenda diversity across communication channels, it confirms that there exists high variation

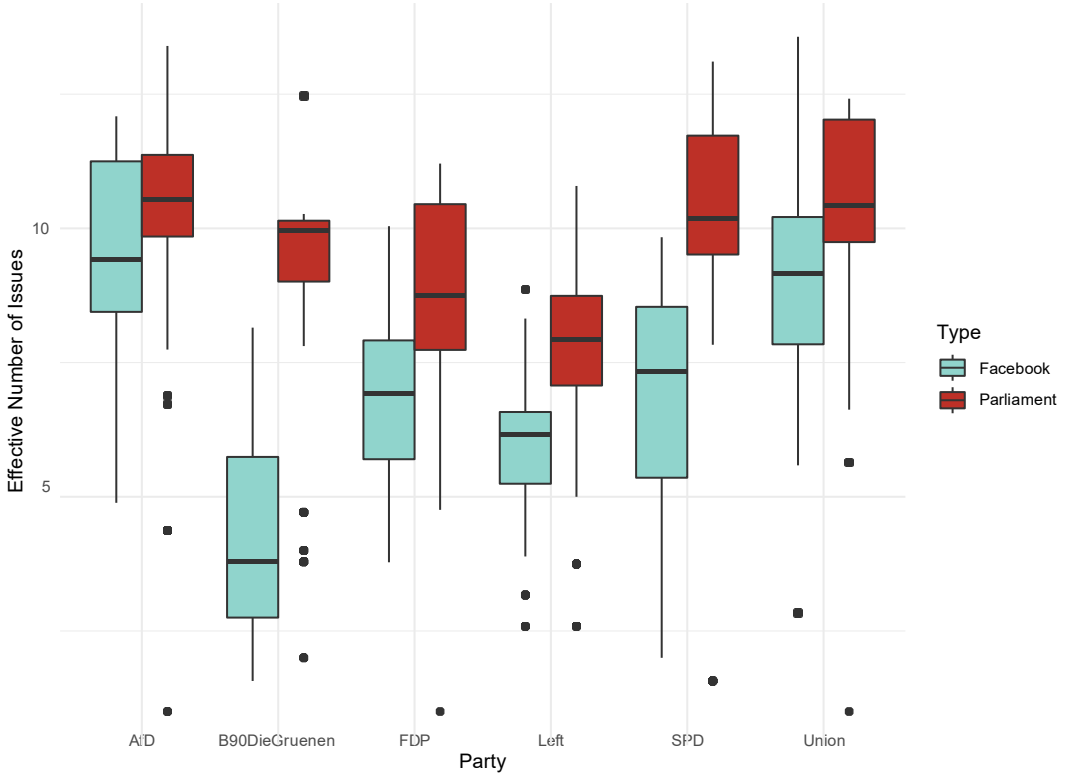


Figure 3.1: Diversity in issue attention indicated by effective number of issues across parties and communication channels

across channels as well as parties. Agenda diversity, as indicated by the Effective Number of Issues, is generally higher for parliamentary speeches. This could be due to the structural constraints of parliamentary setting, which forces parties to address a broader spectrum of issues (Proksch & Slapin, 2014). The diversity of Facebook communication is lower for every party; however, to a different extent. It also shows a larger distribution of diversity for most parties considering the extent of its 25th and 75th percentiles. The AfD and the Union have the most similar median value for both Facebook and parliamentary communication, suggesting similar levels of agenda diversity. The Green Party represents the opposite extreme, showing the largest difference in agenda diversity between the communication channels. This may be due to its status as a governing party, which requires addressing a broad range of issues in parliament while allowing the party to focus more on its core issues (e.g., environmental) in social media communication.

The high levels of agenda diversity observed in the less structured communication environment of Facebook are surprising for the AfD, but also to a lesser extent for the Left, both

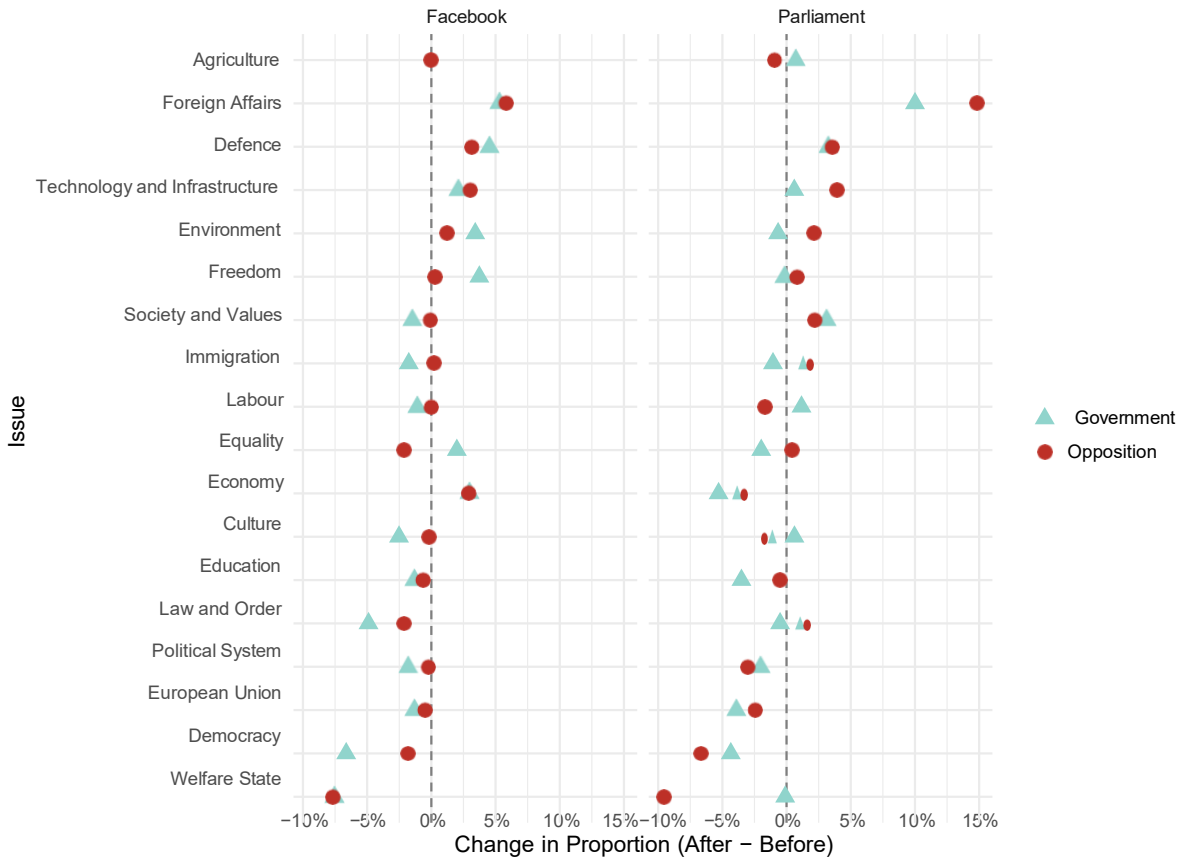


Figure 3.2: Change in issue proportion before and after the invasion

of which are single-issue parties. One potential explanation for the AfD could be the party's increasing integration into the political mainstream, as niche parties often need to expand their issue focus over time to maintain electoral credibility (Bergman & Flatt, 2020; Meguid, 2023; Meyer & Wagner, 2013; Zons, 2016). Furthermore, while parties maintain a strategic focus on their core issues, they also devote significant attention to topics owned by their political competitors (Sigelman & Buell, 2004). The outlier of the Green party as a niche party with little agenda diversity on Facebook, despite its government participation, might be due to the party's focus on X instead of Facebook (Fuchs & Motzkau, 2023). Additionally, the heightened relevance of environmental issues in the context of the current crisis (Dempsey, 2023) may have further contributed to the Greens' focus on a smaller scope of issues.

For the next step, I examine changes in agenda diversity following Russia's invasion of Ukraine to see if there are any shifts in issue proportion before and after the invasion. Figure 3.2 illustrates the change in average issue proportions with the onset of Russia's invasion

across the two communication channels (Facebook and Parliament), differentiated by party status (Government vs. Opposition). This visualisation also confirms the validity of the measurement approach, as expected increases can be observed for *Foreign Affairs* and *Defence*, but also for *Freedom*, *Technology and Infrastructure*, and *Environment*. These are all policy areas that represent either core issues related to the crisis or have become more salient for the public and align with documented post-invasion debates such as questions of security addressing military aid or defence budget adjustments (Dempsey, 2023; Graf, 2022).

Moreover, the graph reveals distinct patterns between government and opposition parties. Government parties, indicated by the blue triangles, increased attention to *Foreign Affairs* by approximately 5%, while decreasing their emphasis on *Democracy* and *Law and Order* issues on Facebook. In their parliamentary speeches, they paid even more attention to *Foreign Affairs* (around a 10% increase) while mentioning other issues to varying degrees. Opposition parties particularly reduced their mentions of *Welfare State* in both communication channels, suggesting that social welfare issues are set aside during agenda disruptions. On Facebook, opposition parties increased posts addressing *Foreign Affairs*, *Defence*, and *Economy*, while their parliamentary speeches remained relatively stable with only small increases in *Foreign Affairs*.

This strategic re-prioritisation, especially by government parties but also to some degree by opposition parties, suggests a concentrated effort to address the immediate crisis. Crisis-related issues – especially *Foreign Affairs*, *Defence*, *Freedom*, *Environment*, *Immigration*, and *Economy* – show divergent patterns across party status and communication channels. While *Foreign Affairs* predictably increased for both groups – with opposition parties showing stronger effects in Parliament – other crisis-related issues display more complex patterns. Generally, parliamentary speeches show higher proportions of these issues in opposition communications, while Facebook posts exhibit more issue-dependent variation, suggesting strategic differences in how parties frame issues across different communication platforms during crisis periods. One example is Equality, which received more emphasis from governing parties on Facebook, while opposition parties decreased their attention to it, whereas the opposite pattern emerged in parliamentary speeches. Similarly, both opposition and governing parties have increased their Facebook posts addressing economic issues, while parliamentary speeches show a decrease in

proportion for both. This further supports the existence of varying simultaneous agendas on different communication channels (Ivanusch, 2025), even during disruptions.

3.5.2 Impact on Agenda Diversity

Table 3.2: Regression results examining the interaction effects of invasion, communication channel, and party status on agenda diversity, controlling for party fixed effects

	Model 1	Model 2	Model 3
After Invasion	0.7*	0.4	0.03
	(0.2)	(0.39)	(0.13)
Parliament		2.07*	2.87***
		(0.69)	(0.14)
Opposition			1.73***
			(0.11)
After Invasion × Parliament		−0.06	0.45*
		(0.7)	(0.19)
After Invasion × Opposition			0.67***
			(0.16)
Parliament × Opposition			−1.43***
			(0.19)
After Invasion × Parliament × Opposition			−0.85***
			(0.25)
Num.Obs.	5138	5138	5138
R2	0.24	0.39	0.25
R2 Adj.	0.24	0.39	0.25
AIC	22356.5	21205	22290
RMSE	2.13	1.9	2.11
FE: Party	X	X	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Turning towards the regression analysis to test the previously stated hypotheses, Table 3.2 illustrates the impact of the invasion on agenda diversity (Effective Number of Issues). The first hypothesis posits that agenda diversity increases in response to crises. Following this hypothesis, Model 1 only measures the impact of the invasion on agenda diversity without any control variables but with party fixed effects. It confirms the hypothesis that the crisis has

resulted in a statistically significant increase in agenda diversity. More precisely, it has led to a slight increase of 0.7 issues, holding party-specific factors constant.

However, when turning to the second hypothesis that also takes into account the variation between communication channels, the effect of the invasion on agenda diversity stops being significant. This means that the previous significant impact of *After Invasion* is mediated by the type of communication channel, which now has a significant positive impact on agenda diversity. Parliamentary speeches significantly increase the number of issues that parties address and result in approximately two more issues in a weekly agenda compared to the Facebook agenda. The interaction term of *After Invasion* and *Parliament* also shows no significant effect, even after hypothesis testing. This suggests that although parties have a higher agenda diversity in parliamentary settings, the invasion has no significant impact on agenda diversity across communication channels, while holding constant any party variation. These findings, therefore, do not support my second hypothesis but give an indication that party variation might play an important role in agenda diversity. However, they provide first evidence that more flexible communication environments like Facebook result in lower diversity, suggesting this to be a strategic choice by parties.

Model 3 in Table 3.2 provides a more nuanced picture of crisis communication patterns, taking into account party variation. The final hypothesis posits that opposition parties expand their issue agendas more than incumbents during crises, particularly on social media. Model 3 in Table 3.2 examines agenda diversity across party status and communication channels, revealing significant variation in behaviour for parties across both Facebook and parliamentary communication, with important variations by party status. Similar to the previous model, *After Invasion* remains insignificant, while *Parliament* and *Opposition* show a statistically significant increase in agenda diversity, with opposition parties generally addressing 1.73 issues more in a week than governing parties. All interaction terms have a statistically significant effect on agenda diversity. In order to interpret the impact of the interaction terms, I continue with hypothesis testing and visualise the results in Figure 3.3.

To better illustrate how party status interacts with communication channels, Table 3.3 presents the marginal effects of the invasion on agenda diversity. The main effects of *After*

Table 3.3: Model 3 hypothesis testing - marginal effects of invasion on agenda diversity

Main Effects of *After Invasion*					
Party	Channel	Estimate	SE	*p*	95% CI
Government	Facebook	0.031	0.132	0.81	[−0.23, 0.29]
Government	Parliament	0.478***	0.134	< 0.001	[0.22, 0.74]
Opposition	Facebook	0.7***	0.094	< 0.001	[0.52, 0.887]
Opposition	Parliament	0.298*	0.143	0.0366	[0.019, 0.578]
Between-Group Comparisons					
Comparison		Estimate	SE	*p*	95% CI
Opposition Facebook vs. Parliament		0.4*	0.171	0.018	[0.07, 0.74]
Government Facebook vs. Parliament		−0.45*	0.188	0.018	[−0.849, −0.108]
Government vs. Opposition (Facebook)		−0.69***	0.163	< 0.001	[−1.01, −0.371]
Government vs. Opposition (Parliament)		0.18	0.2	0.36	[−0.2, 0.56]

Note: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Invasion reveal a consistent pattern for parliamentary speeches, with statistically significant increases in agenda diversity for both government and opposition parties following the invasion. Governing and opposition parties address approximately 0.5 and 0.3 more policy issues respectively after the invasion. Turning towards Facebook, opposition parties show a similar but larger increase in agenda diversity on Facebook compared to before the invasion, with 0.7 more issues on their agenda. Government parties' Facebook communications, however, show no significant change in agenda diversity following the invasion. In other words, any shifts in their communication replaced previously discussed topics rather than expanding the overall range of issues. This pattern of effects is also clearly visualised in Figure 3.3.

Comparisons between the groups (party status and communication channel) yield further insights. The contrast between opposition parties demonstrates a significant effect when comparing their Facebook and parliamentary communication, with Facebook showing a substantially larger increase in diversity after the invasion than the parliamentary speeches. Government parties, on the other hand, show a significant decrease, with Facebook having a smaller agenda diversity than the parliament after the invasion. This further confirms the previous findings.

The analysis reveals a significant difference of 0.69 issues between government and opposition parties' Facebook communication following the invasion, with governing parties exhibiting less diverse agendas than opposition parties, as shown in Figure 3.3. Interestingly, parliamentary communication showed no such difference between government and opposition parties.

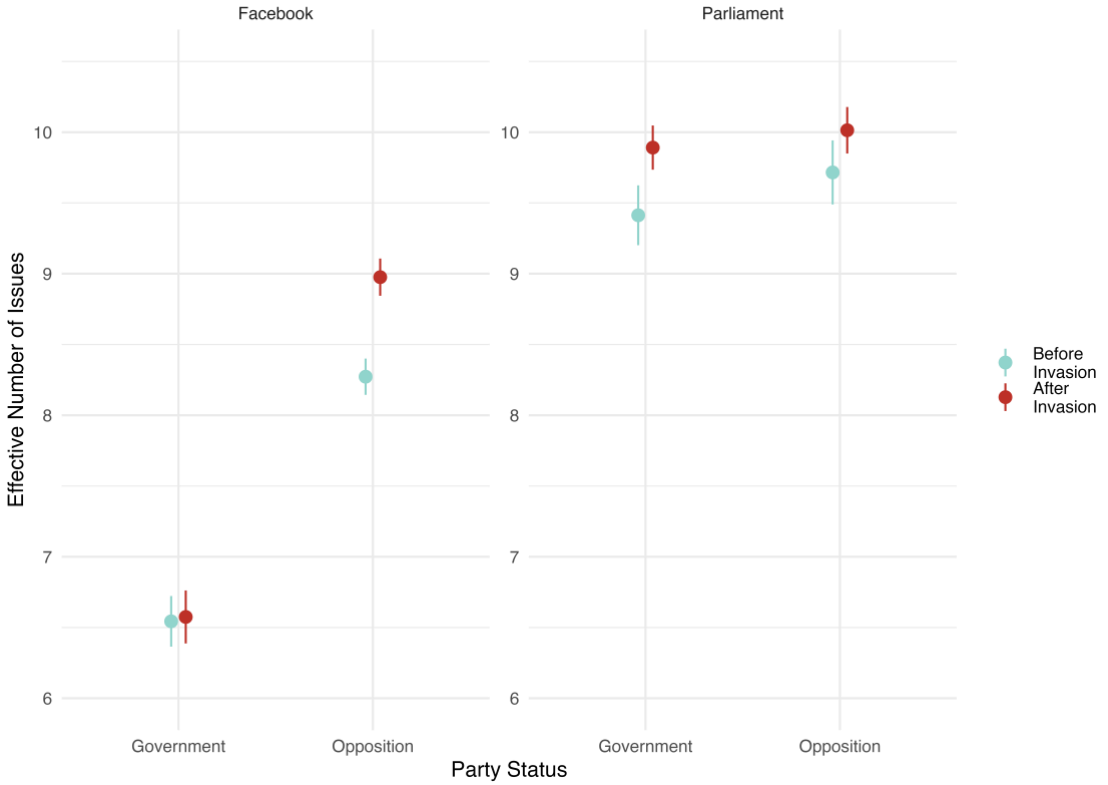


Figure 3.3: Marginal effects of invasion for Government and opposition parties by communication channel.

This suggests that parliamentary contexts may impose more uniform constraints during crises, which results in similar effects for both groups of parties. These findings partially confirm the third hypothesis, with the lack of expected difference in parliamentary agenda diversity being the notable exception. These results challenge the simplistic view that crises uniformly narrow political agendas, suggesting instead a more complex relationship mediated by institutional contexts and party status.

This channel-specific asymmetry highlights important strategic communication differences, providing empirical support for theories of 'venue shopping' (Baumgartner & Jones, 1993) beyond offline ecosystems in political communication. Parties strategically select channels that allow them to pursue their preferred framing strategies during crises. In the *Bundestag*, both government and opposition parties significantly increased their agenda diversity without statistically significant differences between them. This may be attributed to the German *Bundestag*'s consensual style, which limits government control over the agenda while granting the opposition substantial institutional influence (Sieberer, 2006). The parliamentary setting promotes

a general expansion of issues across all parties as crisis-related matters are incorporated into the existing agenda, rather than causing a complete reshuffling of priorities. This pattern might contrast with studies of presidential systems where executive communication is less bound by parliamentary norms and translates only partially to other parliamentary systems such as the UK or Portugal (Döring & Hallerberg, 2004). Those cases might show different adaptations to crises. Additionally, the observed patterns could be influenced by coalition dynamics specific to the German context, where multiple government parties may need to address different issue areas, also beyond their preferred policy domains, to maintain coalition stability.

On Facebook, however, patterns are more closely aligned with theoretical expectations. Government parties maintained consistent agenda diversity levels after the invasion, demonstrating significantly narrower issue focus compared to opposition parties. This supports the hypothesis that during crises, government parties concentrate their communication on relevant policy issues to signal competence, while opposition parties broaden their issue attention. The stability in government Facebook communication might reflect risk aversion rather than strategic focusing. Governing parties may avoid addressing new issues where their positions are not yet fully developed. Alternatively, they may have maintained issue diversity while changing the tone or framing of their communication, a qualitative shift not captured in the diversity measurement.

Overall, the findings support Ivanusch's (2025) assertion that different communication channels foster distinct agenda patterns. This divergence in communication strategies between channels indicates that citizens following only one communication channel could potentially receive fundamentally different understandings of crisis responses, creating 'parallel issue universes' in hybrid media environments. The expansion of issue diversity by opposition parties during crises might also contribute to information overload among citizens (Park, 2019), potentially undermining effective public understanding of critical policy responses.

3.6 Conclusion

This study contributes to the understanding of political communication dynamics by examining how crisis events affect parties' issue attention and diversity across different communication channels in today's hybrid media environment. The study focuses on an entropy-based measurement of agenda diversity for over 5,000 Facebook posts and parliamentary speeches of German parties in the context of Russia's full-scale invasion of Ukraine. Using the BERT model *manifestobert*, the analysis reveals several important patterns in parties' agendas after crisis events.

First, in line with initial expectations, crises appear to generally increase the scope of political communication. This suggests that parties were not able to just reshuffle the agenda and seamlessly incorporate the new developments, especially in the case of parliamentary speeches. Instead, the invasion disrupted parties' agendas, resulting in a significant shift in issue attention. Even though the disruption does not appear to be as explosive and fixating as in the case of news coverage (Boydstun & Russell, 2016), it also suggests that the parliamentary agenda, at least, is not as consistent as executive agendas (Jennings et al., 2011), further lending support to the argument of multiple simultaneous party agendas (Ivanusch, 2025).

Echoing Vliegenthart et al. (2013), the study also underlines the importance of taking into account institutional aspects of agenda-setting, namely the varying strategic considerations between governing and opposition parties when examining communication output. This further underlines the role of communication strategy in agenda-setting. The durability of this rupture is, however, not indicated by these findings and the period of recovery for party communication is uncertain. Considering that the invasion's impact on voter preferences was limited (Mader & Schoen, 2023) and parties' strong interest in being responsive to voters' preferences, I would not expect that this rupture lasts long.

Second, the impact of the invasion on agenda diversity varies by communication channel. While the structured nature of parliamentary debate appears to strongly limit strategic expansion or restructuring of agendas, resulting in similar significant increases in agenda diversity for both government and opposition parties, social media presents a divergent dynamic. This

suggests that the informal and strategic nature of social media communication allows parties greater flexibility to increase or decrease their issue attention. This finding further supports previous findings emphasising the existence of multiple communication arenas with parallel issue agendas (Elmelund-Præstekær, 2011; Ivanusch, 2025). It highlights the importance of studying agenda competition across different empirical sources, across both online and offline ecosystems.

These findings have important implications for our understanding of political communication in hybrid media environments. They highlight the need to consider both institutional constraints and party status when analysing agenda-setting strategies and reinforce the importance of analysing both online and offline communication channels (Langer & Gruber, 2021). Further contributing to the logics of a hybrid media system (Chadwick, 2017), the nuanced interactions between communication channel, party status, and crisis contexts reveal that, in such environments, parties do not uniformly expand issue diversity, but rather shape it in ways contingent on political roles and strategic considerations. Focusing on a single communication channel might not provide a holistic picture of parties' issue attention.

There are also several limitations of this study. As mentioned previously, the single case study of Germany during a specific crisis might not be generalisable to other party systems or crises. German parties' communication strategies and their political reality might not translate as easily to other countries considering their mixed-member electoral system, consensus style, and multi-party system (Sieberer, 2006; Tomuschat, 2013). Comparative analyses across different types of crisis events and national contexts would improve our understanding of how institutional settings and crisis characteristics interact to shape political communication strategies. Furthermore, the specific architectures and constraints of other social media platforms such as X or TikTok might provide parties with different opportunities or limits to address crises as their communication practices seem to differ across platforms (Stier et al., 2018). Therefore, extending this analysis to other online (and offline) communication channels might provide a more comprehensive understanding of how crises affect parties' agendas.

Furthermore, while this chapter mainly focuses on agenda diversity of parties, it does not address how specific policy issues might have been framed in different ways. This second-level

agenda-setting effect essentially suggests how an issue is defined by actors (Coleman & Banning, 2006). For instance, policy issues can have an economic frame by parties emphasising the costs and financial implications of the issue or of a proposed action. Similarly, immigration can be framed as a law and order issue or a question of equality (Boydstun et al., 2013; Mendelsohn et al., 2021). In a subsequent step, research should investigate whether the invasion has significantly affected the framing of certain policy issues and how this differs across online and offline communication channels.

Chapter 4

How do voters blame governments for failure on social media? Blame attribution after the 2021 Ahrtal floods in Germany

4.1 Blame Attribution in Multilevel Governance Systems

The final empirical chapter takes a different perspective and moves from the communication of political elites to how citizens act on social media. In recent decades, democracies have undergone three significant transformations: the adoption of multilevel governance through federalisation or decentralisation (Rodríguez-Pose & Gill, 2003), the erosion of trust in media and political elites (Dalton, 2018; Newman et al., 2024), and the emergence of social media (Thorson et al., 2021; Tucker et al., 2017). The combination of these shifts has profound implications for political accountability, particularly during crises, when citizens rely on immediate, accurate and accessible information to assign blame for policy failures and governance shortcomings. Blame attribution and accountability, a cornerstone of democratic governance, not only shape public opinion but also influence electoral outcomes as citizens evaluate the performance of governments and political actors (Arceneaux & Stein, 2006; Iyengar, 1989).

The effectiveness of blame attribution depends on the availability of reliable information, which highlights the crucial role of news media in enabling citizens to (correctly) identify who is responsible (Holbert, 2005). However, in federal systems, the diffusion of responsibilities across multiple levels of government complicates this process. Citizens often face difficulties in discerning whether accountability lies with local, regional, or federal authorities, which further

challenges the mechanisms of blame attribution (Cutler, 2004). The problem is that wrong information or "ignorance about reality can be quite costly in the realm of democratic politics" (Achen & Bartels, 2016, p. 143).

Although the literature has extensively explored the attribution of blame, particularly in relation to retrospective voting and public accountability (Achen & Bartels, 2016; Arceneaux & Stein, 2006; Iyengar, 1989; Malhotra et al., 2008), significant gaps remain. In particular, accountability in fragmented systems such as federalism and the role of social media in the process of blame attribution and accountability are two topics that have been under-researched. While prior research suggests that federal governments often bear the initial brunt of blame in crises (Achen & Bartels, 2016; Bucher, 1957; Canales et al., 2019; Malhotra et al., 2008), such situations are not static but develop over time, as does information regarding responsibility attributions. Therefore, a key question in this context is whether citizens' blame attribution follows a similar process and evolves over time. The role of heuristics such as media reporting is particularly important in this circumstance, especially considering today's rapidly evolving media environment. The following chapter addresses this critical gap in understanding if and how citizens adapt their blame attributions in response to ongoing events and emerging information reported by media organisations on social media in multi-level governance contexts.

In order to address this gap, I examine the social media blame attribution ecosystem surrounding the 2021 Ahrtal floods in Germany. A natural disaster that not only caused unprecedented human and material losses in Germany but also unfolded shortly before the German federal elections of 2021, intensifying its political salience. The article focuses on the role of media reporting on social media as a mechanism for political learning for citizens' blame attributions. More precisely, I investigate more than 50,000 Facebook posts directly addressing the 2021 floods, using a localised and open Large Language Model (LLM) to classify blame attribution. I analyse not only whether users' blame attribution is in concurrence with media reporting but also if users update their blame targets in the face of new information. Overall, this

study investigates how citizens adjust their blame attribution based on prior media reports and how this attribution evolves in response to new information, such as disaster reports reported on by media organisations on social media.

The findings are cautiously optimistic and reveal that citizens' blame attribution is far from static on social media. Prior blame attributions by media reporting not only have a significant effect on citizens' blame attribution but also influence citizens to shift their blame targets in line with prior media reporting, likely when new information emerges. These results provide evidence that the media remains critical for political knowledge building, even in online environments, and underscore theories of motivated reasoning and evolving public perceptions (Iyengar, 1991; Lupia, 1994). It also further confirms that previous studies' findings on citizens' capacity to make unbiased blame attributions (Malhotra et al., 2008) can be extrapolated to the social media ecosystem.

Lastly, these findings highlight a broader challenge in crisis accountability. If blame attribution is systematically skewed towards an actor, such as the federal government, public perceptions of governance effectiveness may become distorted, potentially obscuring the role of state and local authorities in crisis management. Furthermore, considering the crucial role of media reporting for political knowledge building and accountability, quality journalism becomes indispensable, especially in online ecosystems where incidental exposure can have lasting effects (Bakshy et al., 2015).

This chapter starts by providing an overview of blame attribution and its manifestation in federal systems. I then continue by presenting factors that influence blame attribution. The following sections contain the case study and the methods employed to test the previously stated hypotheses. I finally present both descriptive findings and the results of a regression analysis. I end with a discussion on media blame attribution and its role in political learning, along with further conclusions.

4.2 Theoretical Foundations of Political Accountability

(Blame) Attribution is a central element in politics and public opinion, allowing individuals to identify causes and explain events. Studies in political science have long examined retrospective voting (Key, 1966), while psychological research has explored attribution processes (Shaver, 2012). By framing political issues as questions of responsibility, (causal) attributions can influence political agendas and impact electoral outcomes, as extensively discussed in the literature on retrospective voting (Achen & Bartels, 2016; Arceneaux & Stein, 2006; Baumgartner & Jones, 1993; Iyengar, 1989). While the classic electoral accountability reward-punishment model posits a clear link between policy performance and voter choice (Fiorina, 1978; Key, 1966), this perspective has been challenged by scholars who examine how voters assign political responsibility. This chain of accountability is notably more complex in multiparty and federal systems, which complicate the process of blame attribution (Arceneaux & Stein, 2006; Cutler, 2004; Powell & Whitten, 1993). Such multilevel governance structures exacerbate these challenges by introducing additional layers of decision-making and various actors for potential blame attributions.

This is particularly relevant when taking into account that there has been a global trend towards devolution in recent decades, and countries have increasingly adopted more multilevel structures (Rodríguez-Pose & Gill, 2003). They have moved towards a more decentralised approach to governance, even in the case of traditionally centralised states like the United Kingdom or France. With respect to questions of accountability, these dynamics create fertile grounds for political actors to strategically shift blame to other governance levels, as seen in crisis responses of various kinds (Hinterleitner et al., 2023; Souris et al., 2023). It affects what Hobolt et al. (2013) call 'institutional clarity' – that is, the concentration of political authority within institutions. Vertical divisions of power, such as those found in federal systems, undermine this clarity by dispersing authority across multiple levels of government. Hence, citizens need to rely heavily on external information sources, particularly media and institutional reports, to navigate this complexity. Understanding whether media reporting has an impact on citizens' blame attribution processes is, therefore, critical in assessing how they form political

judgements and hold actors accountable for their failures.

Blame attributions are especially significant in the context of crises, which tend to heighten public attention and may also give rise to increased threats, often with severe political and social consequences (Moynihan, 2012). Crises such as natural disasters, public health emergencies, or economic downturns challenge the capacity of governments to respond effectively, exposing failures in compliance, preparedness, or crisis management. The literature emphasises that these failures not only shape citizens' evaluations of government performance but also influence their trust in institutions and voting behaviour (Atkeson & Maestas, 2012; Reinhardt, 2015). Moreover, they can foster motivated reasoning based on accurate facts, with citizens consciously searching a broad range of information during and after crises, even if it runs counter to prior-held beliefs (Kunda, 1987, 1990).

Despite these insights, much of the existing literature on blame attribution is based on experimental settings or revolves around a specific case study, with a large number of studies focusing on Hurricane Katrina in the United States (Busby et al., 2019; Gomez & Wilson, 2001; Maestas et al., 2008; Malhotra et al., 2008). Fewer studies investigate real-time blame dynamics in parliamentary or other multilevel systems, such as Germany, where crises often unfold across overlapping jurisdictions and multiple political actors. Furthermore, while research has extensively examined the role of partisanship in the formation of blame (Gomez & Wilson, 2008; Maestas et al., 2008; Tilley & Hobolt, 2011), less attention has been paid to external factors that influence how blame attributions evolve over time. For example, investigative reports, parliamentary inquiries, and findings of working groups are taken up by media reporting, which then provides citizens with new information about the respective crisis and its aftermath, potentially altering their initial perceptions.

Furthermore, social media has become a crucial avenue for citizens to access information, especially during crises, when people tend to require more orientation and rely more heavily on social media for news (Newman et al., 2024; Van Aelst et al., 2021). Social media platforms provide a dynamic overview of how public perceptions evolve during and after a crisis. Local government officials, as well as affected citizens, become more visible outside their regional context as their social media communication reaches a broader audience and can potentially

draw the interest of media organisations (Canales et al., 2019). Understanding the interaction between the media, political actors, and information on disaster management in online ecosystems such as social media is critical, as it not only shapes citizens' evaluations of government performance but also affects public trust in governance. By disseminating detailed findings and assigning responsibilities through social media channels, media outlets create opportunities for citizens to review their blame attributions and potentially adjust their interpretations of the disaster.

This study contributes to the literature on crisis communication and blame attribution by investigating the role of media reporting in shaping political knowledge and public perceptions after crises on social media. It addresses the central question: *(How) does media reporting affect people's blame attributions on social media, particularly in multilevel governance systems?*

4.3 Determinants of Public Blame Assignment

One way for citizens to bridge the gap between government performance failure and blame attribution in multilevel structures is through media-provided shortcuts. Mass media are key actors in the context of crisis and blame attribution, as they represent a central way through which people can obtain information about politics (Dunaway & Graber, 2022). The media can set the agenda and impact the salience of a given issue, which is taken up by citizens. Citizens can also take note of media blame frames such as problem definitions, causal interpretations, and moral evaluations, and update their own knowledge accordingly (Entman, 1993; Iyengar, 1991; McCombs & Shaw, 1972; van Dijk, 1985). For example, media narratives often define the scope of responsibility by focusing on specific actors or institutions, while investigative reporting can uncover new dimensions of crises that alter public perceptions.

However, the media's role in shaping blame attribution is not unilateral; it interacts with political actors' strategies, including their use of rhetoric, deflection, and symbolic acts or consequences, such as resignations. For example, politicians use different strategies, such as scapegoating others or deflecting responsibility to different levels of governance, to manage

their image during crises (Souris et al., 2023). These events and narrative frames are taken up by media reports to inform the public and to draw attention to new developments. Since public opinion, particularly regarding blame attribution, is highly susceptible to the flow of new information, the way the media assigns responsibility has a strong influence. Scholars such as Lupia (1994) and Popkin (1991) have demonstrated how citizens, often without detailed knowledge, rely on information cues from the media to make sense of complex issues and use the information provided to gain knowledge about policy issues (Barabas & Jerit, 2009). Citizens learn new political information, especially when it is easily accessible and necessary, such as in the context of crises (Prior, 2002).

This agenda-setting effect is intensified on social media, which enables direct expressions of blame attribution without traditional gatekeepers, allowing users to interact with media content and publicly assign blame to political actors. While traditional media used to be the main source of reliable information and news for citizens during crises, it has been replaced by social media platforms due to their faster and more immediate coverage (Newman et al., 2024; Van Aelst et al., 2021). In addition, social media platforms such as Facebook allow people and media to share more personal stories, videos, and pictures related to the media coverage or the disaster itself, which often carry a high level of credibility and emotional weight (Vettehen et al., 2008). Furthermore, the substantial amount of salient news shared on social media platforms results in a high likelihood that users are incidentally exposed to political information (Bakshy et al., 2015). People engage with this information and share these posts, especially if they relate to their own personal experiences, contain references to politics or government, or evoke a negative emotion such as blame attribution (Tenenboim, 2022). Similarly, users might post updates and news related to their exposure to the disaster. Therefore, I argue that the way in which media assigns responsibility influences citizens' blame attributions.

> H1: Greater prior media attribution of blame towards a political actor is associated with a higher likelihood that citizens attribute responsibility to that same actor.

Building on this, a critical question emerges regarding media's capacity to influence belief revisions in response to emerging information. Initial reporting on crisis events typically occurs

simultaneously with the unfolding situation itself. As Dunaway and Graber (2022, p. 110) observe, "pressures to report news rapidly while it is happening often lead to disjointed fragments and disparate commentary". This creates an information environment characterised by an urgent demand for factual understanding amidst a scarcity of verified knowledge, especially on social media. It is predominantly during subsequent phases of media coverage that factual inaccuracies undergo correction and evidence of governmental shortcomings (or successes) tends to surface (Atkeson & Maestas, 2012; Dunaway & Graber, 2022). For instance, while citizens often initially blame the national government due to a lack of nuanced knowledge (Bucher, 1957; Gomez & Wilson, 2008; Malhotra et al., 2008), blame attribution can change when new information or events unfold. Consequently, media narratives evolve over time as new evidence emerges and responsibility for mismanagement potentially shifts to different actors.

The literature on misinformation presents mixed findings that highlight significant challenges in correcting false information (Li, 2020). However, exposure to legacy media remains a key mechanism through which individuals update their knowledge following information gains. Research has shown that exposure to media not only enhances policy-specific knowledge but can also lead to changes in opinion through an updated understanding of political events (Barabas & Jerit, 2009; Chaffee & Kanihan, 1997) and affects how citizens perceive the competence of parties (Walgrave et al., 2009). This is further supported by various studies, such as the one by Malhotra et al. (2008), which finds that after receiving new information about government actors' job responsibilities, respondents adjusted their initial uninformed assessments to align with the respective areas of accountability. Similarly, blame attribution is not limited to individual political actors but extends to broader contextual connections, such as policy frameworks, an effect that is also shaped by media reporting (Brutger & Guisinger, 2024).

Social media platforms offer comparable opportunities for political learning and play an increasingly central role in today's media environment (Bode, 2016; Newman et al., 2024). Unlike traditional media outlets, social media exposure is driven by a complex interplay of individual preferences, algorithmic curation, and social networks (Thorson & Wells, 2016). This dynamic fosters both selective exposure and incidental encounters with political news

(Thorson et al., 2021), particularly in the context of high-salience events such as crises. In these rapidly evolving information environments, media cues play a crucial role in shaping public perceptions of responsibility and provide citizens with opportunities to reassess and update their political knowledge. This leads to the second hypothesis, addressing the change in blame attributions.

> H2: Increases in prior media blame attribution towards a political actor lead to changes in citizens' blame attributions, such that citizens become more likely to shift their blame towards that actor over time.

Lastly, in the context of blame attribution on social media, it is crucial to distinguish between ordinary citizens as users of social media and political actors, such as politicians, political organisations, or parties. Political actors are also subject to motivated reasoning, which makes them cognitively less responsive to external cues, such as crisis developments presented by the media. According to political psychology literature, individuals with strong prior beliefs are more likely to interpret new information in a way that confirms their existing attitudes (Kunda, 1990; Zaller, 1992). However, at the same time, these actors and their communication operate under different incentive structures and communicative logics, which shape how they engage with media narratives and assign responsibility during crises or critical political events.

Political actors often tend to engage in performative or signalling communication to influence media coverage and to promote themselves and their party (Jackson & Lilleker, 2011; Jungherr, 2016; Metz et al., 2020). In cases of unpopular decisions or mismanagement, they often strategically shift blame to retain credibility. They have an interest in employing presentational strategies in order to shape public perception, such as through diffusing responsibility to different actors (Mortensen, 2012). For instance, elected regional officials tend to shift blame towards the national government, especially if they belong to a different party. Especially federalist structures make it easier for political actors to dilute accountability and to shift blame towards different levels to protect their public image and maintain political credibility (Hood, 2010; Maestas et al., 2008). This effect should also be particularly pronounced in crisis situations, where disaster management and its communication have lasting political consequences.

Hence, political actors employ blame attributions with different goals in mind than citizens and are more likely to shift blame.

H3: Political actors are more likely than non-political users to shift their blame attributions towards a different political actor.

4.4 Case Selection: The 2021 Ahrtal Floods

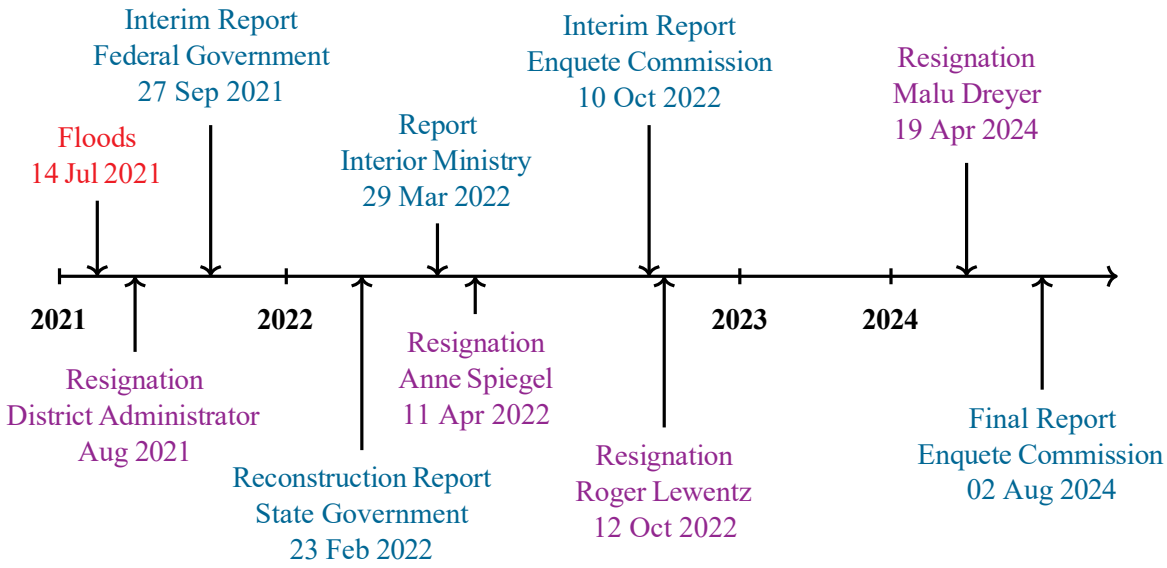


Figure 4.1: Timeline of significant events related to flood investigation.

In order to analyse the role and effect of media blame attribution on social media, as stated in the previous hypotheses, I focus on a case study in Germany, namely the 2021 floods in the Ahrtal (Ahr Valley). Heavy rain in mid-July 2021 resulted in severe and heavy floods in Germany, especially in the states of North Rhine-Westphalia and Rhineland-Palatinate, which were particularly affected with 180 deaths and damages amounting to 33 billion euros. Most of the damage and deaths occurred in the Ahr Valley, a narrow valley where the Ahr River flows between steep hillsides. Due to the floods, the river transformed into a torrential flood that swept away entire villages from the mountainsides (Bundesministerium des Innern und für Heimat & Bundesministerium der Finanzen, 2022).

Shortly after the disaster, experts spoke of massive system failure and criticised the lack of a national warning system. Because the floods occurred shortly before the federal elections

in September 2021, many politicians appeared frequently on the disaster site, and the media presence was strong. In addition, the disaster also involved an unprecedented social media presence with calls for donations and helpers, but also demands for accountability. The disaster also had significant political implications, with three politicians across different governance levels resigning and the establishment of an Enquete Commission to develop prevention concepts for future effective disaster protection as well as to analyse the flood and its consequences (Bundeszentrale für politische Bildung, 2023).

Figure 4.1 shows an overview of the timeline after the floods. It also shows various political actors who have resigned as a consequence of the flood's disaster management at different points in time and provide different targets for blame attribution. While the district administrator of one of the main affected districts stopped performing his duties in August 2021 and retired soon after, others, such as the then Federal Minister for Family Affairs Anne Spiegel or the Rhineland-Palatinate Interior Minister Roger Lewentz, resigned only the year after (Bundeszentrale für politische Bildung, 2023). This case therefore provides a unique opportunity to study blame attribution on social media, how citizens assign blame, and how blame attribution can develop over time due to the various political and news developments over the years.

4.5 Methods

To analyse the effect of previous blame attribution by media reporting of the disaster on social media, I derive the Facebook data from *CrowdTangle* before its closure in August 2024, using keywords related to *"Ahrtal"* to access all posts in German related to the disaster since July 2021. This resulted in a total of 47,019 observations. In order to only keep those posts with blame attribution, I employ a Large Language Model (LLM) to classify each post based on several criteria, which enhance the accuracy of blame identification. LLMs utilise in-context learning and also consider the semantic context. They are thus able to analyse more complex and implicit linguistic structures such as those in blame attributions (Atkeson & Maestas, 2012). Additionally, LLMs have been shown to outperform crowd workers and expert coders for text annotation tasks such as social media messages (Gilardi et al., 2023; Törnberg, 2024) and have

been effectively used in several studies in political science (Le Mens & Gallego, 2025; Müller & Proksch, 2024). However, it is important to keep in mind that they also come with epistemic challenges as especially proprietary LLMs can be inherently black-boxed (Ollion et al., 2024).

Due to the flaws and limitations of proprietary LLMs, I apply *Ollama*, a locally deployed framework that has advantages in terms of reproducibility, privacy, and reduced dependence on commercial entities (Spirling, 2023). Due to the highly imbalanced data in which my target class is under-represented, achieving high precision is crucial for correctly identifying this class of interest. I evaluated multiple model outputs using various prompting strategies, as shown in Figure C.1 in the Appendix. Based on performance metrics, I selected Meta's open-source Llama 3.1 8B LLM with a few-shot prompting approach (incorporating example cases directly in the prompt) and a low temperature setting of 0.1 to minimise random variation in the outputs. Although Meta's Llama models are not the most transparent, as they provide little information about the data or the labour involved in creating the foundation model, they are still an improvement compared to other, more commonly used models such as the GPT models from OpenAI or Google's Gemini models (Bommasani et al., 2025).

To examine the nuances of blame attribution in the context of the Ahrtal floods, I focus on several key aspects. First, I assess whether a post contains blame, defining blame attribution as the (pre)conception of blame and responsibility assigned to an actor in response to a negative event (Shaver, 2012). Specifically, I identify the presence of causal statements and terms related to responsibility. Second, I classify the target of blame attribution, distinguishing between different actors such as politicians, state governments, and the federal government to account for the vertical structure of federalist systems such as Germany. To improve reliability and minimise the risk of hallucinations produced by the LLM, I implement clear classification guidelines. The specific prompt used for this classification is detailed in Section C.1 in the Appendix. This process results in a total of 7,108 posts that contain blame attribution, as shown in Table 4.2.

4.5.1 Dependent Variables

To test my hypotheses, I use two sets of dependent variables. The first set addresses the first hypothesis and measures the probability that a Facebook user attributes blame to a particular level of government – federal, state, or local – coded as 1 if blame is assigned and 0 if not. It should be noted that posts can contain multiple blame objects and, thus, can have a score of 1 for multiple levels of government.

The second set captures shifts in blame attribution over time, identifying whether users who previously blamed one actor have redirected their blame towards a different government level. I estimate a base model examining overall blame shifts. Specifically, I track whether users who post multiple times generally change their blame attributions across posts. The dependent variable *Blame Change* equals 1 if a user has at least two posts with different blame targets, and 0 if the user maintains consistent blame attribution across posts. I then conduct separate analyses for shifts towards specific levels of government, examining blame redirection to federal, state, and local authorities individually. In particular, some users attribute blame to multiple actors within a single post, which is also considered in this set of variables. Each dependent variable in this set is a binary indicator, with 1 signifying a change in blame attribution.

4.5.2 Independent Variables

To assess the influence of media discourse on public blame attribution, I incorporate a lagged measure of media blame attribution for each actor. This variable captures the number of media mentions in which blame was assigned to a specific government level within the previous three days. This time frame is chosen to reflect the rapid nature of social media algorithms, which prioritise recent content in users' timelines, while also taking into account potential delays in how news is distributed on social media and reproduced by media organisations and Facebook users.[1] Media accounts are defined by their official page category, such as 'journalist' or 'media'.[2]

[1]A robustness check to assess the time sensitivity of this analysis can be found in Section C.3 in the Appendix. I have conducted the same analysis with different time windows (t-1 and t-5). Overall, the results remain the same.

[2]The exhaustive list used in the code contains: 'journalist', 'news_site', 'media_news_channel', 'tv_channel', 'radio_station', 'broadcasting_media_production', 'editorial_opinion', 'magazine', 'topic_newspaper',

Additionally, to address the third hypothesis, I include a measure for whether a Facebook user is classified as a politician, political organisation, or party (coded as 1), based on publicly available profile information on their account. This variable accounts for potential biases in political learning processes between ordinary citizens and political actors, as outlined in the previous section. Finally, I account for temporal variations by including a control variable for the number of days since the disaster.

All continuous variables – the lagged measures of media mentions and the days since the disaster – are also scaled and centred to allow for direct comparison of effect size. Since I am not interested in how one more media mention or one more day affects citizens' blame attributions, but rather in the relative importance of predictors, this approach allows for a more meaningful interpretation of coefficients. Specifically, the effects of the continuous variables reflect changes in citizens' blame attributions associated with one standard deviation increase in each predictor. This also addresses the issue that a one-unit change, such as one additional media post with blame attribution, may be substantively trivial given the distribution of the variables and how social media works. Table 4.1 shows an overview of the descriptive statistics for the original variables before scaling and centring. In the case of media predictors, one unit refers to one post mentioning blame towards a given level of government, so a mean of eight indicates an average of eight posts within the three days before the observation.

Table 4.1: Descriptive statistics of predictor variables before standardisation.

Predictor	Mean	Standard Deviation
Media blaming Local Gov. (t-3)	8.11	78.8
Media blaming State Gov. (t-3)	5.87	54.12
Media blaming Federal Gov. (t-3)	43.4	164.38
Days since Disaster	424.76	280.63

'tv_show', and 'media'.

4.6 Patterns of Blame Attribution on Social Media

4.6.1 Descriptive Findings

Table 4.2: Overview of LLM blame attribution classification results.

Blame	Object	Count	Share
No		42 669	85.7%
Yes		7 108	14.3%
	Federal Government	3 605	50.1%
	State Government	1 791	25.2%
	Local Government	1 673	23.5%
	Politicians	545	7.7%

The results of the LLM blame attribution classification are shown in Table 4.2. More than half of the blame attributions refer to the federal government. The state and local governments have roughly the same number of blame attributions, around 25% and 23% respectively. This first descriptive analysis suggests that within a federal system such as Germany, the majority of citizens tend to blame the federal government instead of the more regional state government or local government, despite the crisis being comparatively local.[3] In the following analysis, I primarily focus on blame attributions addressing the different political levels of Germany: federal, state, and local governments. Politicians have not been included, as they sometimes blur the lines between levels, such as Anne Spiegel, who was eventually part of both the state and federal government. Additionally, they are mostly mentioned in their function as minister or representative of a specific government level, such as the minister-president of Rhineland-Palatinate, and thus classified accordingly.

Since Table 4.2 does not provide any information on the dynamics of blame and movement between categories, Figure 4.2 visualises these shifts using an alluvial diagram. The figure highlights the evolution of blame attribution on Facebook, revealing notable patterns in user

[3]It should be noted that, as previously stated, many posts contain multiple objects of blame attribution. At the same time, various posts had no clear object despite containing blame. Lastly, some users also attribute blame to other institutions and groups not named here such as insurance groups, the EU, or specific media organisations. However, these other actors are not considered since this study's focus is the multilevel structure of federalism and the specific dynamics of blame attribution within it.

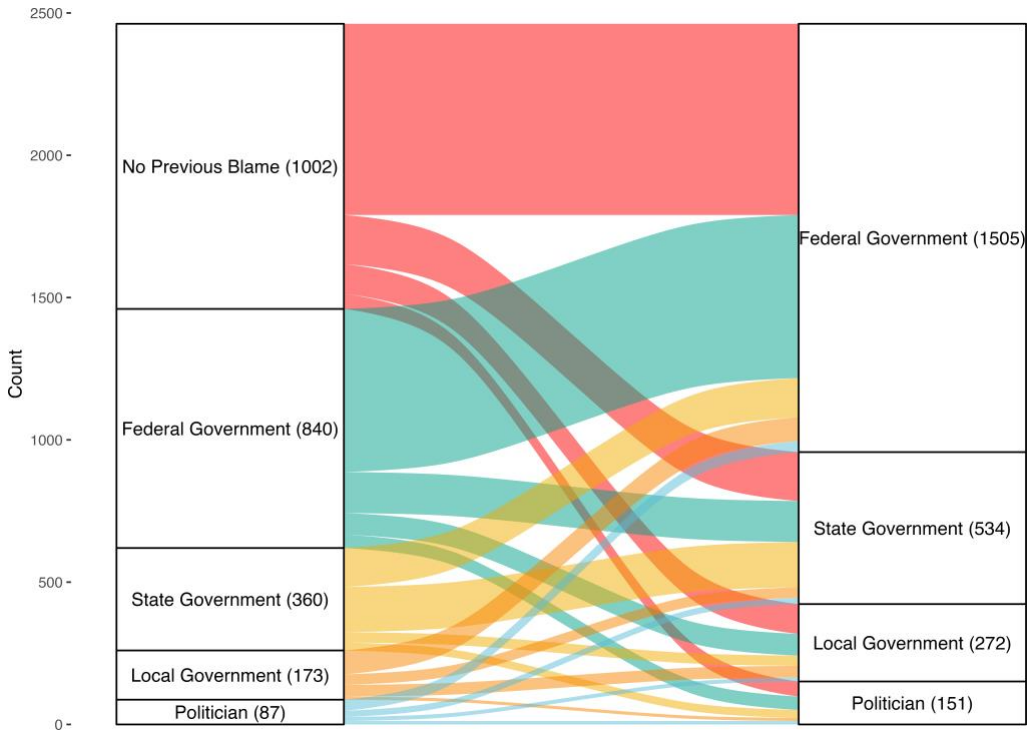


Figure 4.2: Blame change across categories: change between first post containing blame attribution and a following one by the same user.

behaviour. The graph shows if and how users have shifted their blame as long as they posted messages with blame attributions at least twice in relation to the Ahr Valley disaster. The median amount of days between posts of the same user are 113 days (3.7 months) but ranges from 0 days to 1004 days, excluding any account or post of media organisations. This time frame between posts is not surprising considering that the first government report on the disaster was published two months after its occurrence and the subsequent one in February 2022, seven months later. Hence, the time between users' posts of assigning responsibility follows expectations, assuming that users do not randomly post content with blame attributions but instead communicate consciously and are prompted by new information or increased salience of the disaster due to, for example, a newly published report.

A significant portion of initial blame attributions is directed at the federal government, indicating its prominence as a perceived responsible actor related to the disaster. Notably, users who initially assigned responsibility to the federal government and continued to post messages containing blame tend to maintain their focus on the federal government, suggesting a stable

blame attribution pattern at this level. One explanation for this pattern is that initially experts criticised the lack of a national warning system as well as the disaster's proximity to the 2021 federal election. While people tend to blame the national level of governance first, especially considering the lack of information during the early aftermath (Canales et al., 2019; Gomez & Wilson, 2008), the impending election might have significantly affected the later framing of the disaster's management as a question of federal politics, expressing criticism towards the government in the context of the election campaign.

In contrast, blame attributions to state and local governments (or politicians) show an overall smaller count. In the case of initial blame towards the state government, it also seems that people tend to maintain their original blame target or shift responsibility towards the federal government, rather than redirecting blame to the state or local levels. Users blaming the local government mostly shift towards the federal government as a second blame target. Furthermore, the category *No Previous Blame* represents users who only have one recorded instance containing an object of blame in the dataset. In other words, to simulate the direction of blame attribution change, those who only have one post with blame attributions that assign responsibility to a government actor in the dataset have an initial synthetic category. Therefore, the figure also tracks how users transition from no blame (object) to specific blame targets over time.

4.6.2 Logistic Regression

Turning towards the analysis of the previously stated hypotheses, the first one posits that prior media reporting assigning responsibility to a political actor leads to citizens being more likely to blame the same actor. To test this, I model the effect of media blame in the preceding three days on the blame attributions of non-media Facebook users, meaning that any user with a page category related to media organisations has been removed from the analysis. The dependent variables are binary indicators of whether a user attributes blame to the federal government, state government, or local government presented in Models 1 - 3 in Table 4.3. To address the issue of separation in logistic regression, I employ Firth's penalised likelihood logistic regression (Heinze & Schemper, 2002). All continuous independent variables were scaled and

Table 4.3: Log-odds from Firth's penalised logistic regression with scaled and centred predictors, estimating the effect of media blame (t–3) on blame attribution.

	DV: Blame towards		
	Fed. Gov.	State Gov.	Local Gov.
	(1)	(2)	(3)
Media blaming Local Gov. (t-3)	−3.627***	−0.118	3.356
	(0.538)	(0.061)	(0.289)
Media blaming State Gov. (t-3)	−8.242***	1.246	−0.482
	(0.671)	(0.091)	(0.183)
Media blaming Federal Gov. (t-3)	9.314**	−0.46***	−1.431***
	(0.702)	(0.067)	(0.228)
Political Actor	−0.651***	1.172***	−0.780***
	(0.093)	(0.097)	(0.144)
Days since Disaster	0.083	0.108	−0.162*
	(0.046)	(0.048)	(0.068)
Intercept	1.918***	−1.988***	−1.891***
	(0.204)	(0.075)	(0.098)
Num.Obs.	2478	2478	2478
R2	0.376	0.214	0.23
RMSE	0.39	0.36	0.27

*Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$*

centred to have a mean of 0 and a standard deviation of 1, allowing for a direct comparison of their relative impacts on citizens' blame attribution.

Model 1 supports the first hypothesis, demonstrating that one standard deviation increase, which refers to approximately 164 posts of media organisations blaming the federal government, is associated with a 9.3 increase in the log-odds of citizens blaming the federal government. This suggests that if there is a large increase in media posts blaming the federal government, then citizens are very likely to post about the same blame object. Prior media blame towards the local and state governments shows a similarly strong but inverse relationship on citizens assigning responsibility towards the federal government. This suggests a substitution effect, which supports my hypothesis. It means that citizens' blame attribution follows the pattern of media posts assigning responsibility to different levels of government.

A similar pattern emerges in the other two models predicting blame attribution towards the state and local governments. In both cases, prior media blame directed at the federal government significantly reduces the log-odds of citizens attributing blame to more regional levels of government. Specifically, a single standard deviation increase in media blaming the federal government is associated with a 37% ($e^{-0.46} \approx 0.63$) decrease in the odds of users blaming the state government, with an even stronger effect observed for citizens' blame directed at the local government. While media blame targeting the state and local governments shows effects in the expected direction, namely increasing users' blame attribution objects accordingly, these coefficients are not statistically significant.

Interestingly, political actors, including parties and politicians, present a different pattern across the models. They show a similar effect across citizens blaming the federal or the local government, with a decrease of 48% and 54% respectively in the odds if a user is a political actor. At the same time, political actors are generally significantly more likely to attribute blame to the state government. This emphasis on state-level responsibility could be a response to the role of the state parliament as the principal decision-making body, as well as the early resignation of Anne Spiegel, the state minister for Climate Protection, Environment, Energy, and Mobility.

Lastly, the *Days since Disaster* variable only shows a significant effect on citizens blam-

ing the local government, with a 24% decrease in the odds. This could indicate a shift away from holding the local government responsible due to newly emerging information as the crisis unfolded.

Turning to the second hypothesis, I argue that social media users change their previous blame attribution after updates on their political knowledge. In other words, previous blame attributions by media organisations have an impact on users shifting their blame towards the actor that is also blamed by the media, indicating a process of political learning. Following the previous regression, I model the log-odds of a general change in blame attribution (any change of blame object, no matter the direction) in Model 1, as seen in Table 4.4. As in the previous regression table, I use scaled and centred predictors for the continuous independent variables.

Table 4.4: Log-odds from Firth's penalised logistic regression with scaled and centred predictors, estimating the effect of media blame (t–3) on change of blame attribution.

	DV: Blame Change Towards			
	Any Gov.	Fed. Gov.	State Gov.	Local Gov.
	(1)	(2)	(3)	(4)
Media blaming Local Gov. (t-3)	0.244**	−8.820***	−2.463	0.739***
	(0.105)	(3.019)	(1.661)	(0.141)
Media blaming State Gov. (t-3)	0.236*	−26.281***	1.37***	−1.299**
	(0.113)	(5.721)	(0.225)	(0.632)
Media blaming Federal Gov. (t-3)	−0.358***	0.005	−94.327***	−92.513***
	(0.088)	(0.067)	(18.019)	(20.740)
Political Actor	0.309**	0.2	0.688***	−0.824*
	(0.107)	(0.137)	(0.166)	(0.203)
Days since Disaster	0.112*	0.145	0.202*	−0.081
	(0.056)	(0.068)	(0.083)	(0.095)
Intercept	−0.354***	−5.332***	−27.304***	−26.422***
	(0.077)	(0.698)	(4.742)	(5.443)
Num.Obs.	1476	1806	2306	2373
R2	0.039	0.062	0.179	0.155
RMSE	0.49	0.34	0.26	0.21

*Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$*

Model 1 shows that prior media blame towards local or state governments has a positive and significant effect on general blame change. This means that if media organisations post

in the previous three days about the local or state government being responsible for disaster mismanagement, Facebook users are generally more likely to change their blame attribution in the posts. Media assigning responsibility to the federal government within the previous three days, however, leads to a significant decrease in the odds of users changing their object of blame. In other words, they are more likely to remain static with the same object of blame.

Furthermore, political actors are also more likely to generally change blame attribution compared to ordinary citizens. More precisely, they have about 36% ($e^{0.309} \approx 1.36$) higher odds of changing who they blame than other users. This confirms the third hypothesis. It could reflect a strategic effort of political actors to shift blame to other institutions to deflect responsibility or reframe accountability to a different government level when provided with the opportunity (Hinterleitner, 2017; Hood, 2010).

To determine whether the negative effect of prior blame on the federal government is a result of citizens initially attributing blame to the government and subsequently not shifting their attribution, I calculate three additional models that differentiate between the various targets of blame attribution: shifts towards the federal government, the state government, and the local government.

Model 2 in Table 4.4 examines how prior media blame attribution influences a user shifting their blame object towards the federal government. The results show that media organisations previously blaming local or state governments significantly decrease the likelihood of users shifting towards assigning responsibility to the federal government. Interestingly, media blame towards the federal government itself, despite being positive, shows no significant effect. Additionally, the non-significant coefficient for *Political Actor* indicates that ordinary citizens and political actors on Facebook behave similarly regarding blame attribution change towards the federal government.

Model 3, focusing on shifts towards the state government, reveals a different pattern. A standard deviation increase in prior media blame towards the state government (about 54 posts) increases the odds of users shifting blame towards state authorities by almost 4 times ($e^{1.37} \approx 3.94$). Media attributing responsibility to the federal government, however, strongly discourages state-directed blame, suggesting that blame shifts align with prior media coverage. Media

posts about local government, on the other hand, show no statistically significant effect but are aligned with the expected direction. Unlike the previous federal model, political actors are significantly more likely than ordinary users to shift blame towards the state government. Moreover, *Days since Disaster* exhibits a positive and significant impact on state-directed blame shifts, suggesting that over time users increasingly shifted towards assigning responsibility to the state government. This could present an indication of political learning due to new information on the disaster becoming available after some time.

Finally, Model 4 analyses shifts towards blaming local government, providing the strongest support for the second hypothesis among all models in Table 4.4. A standard deviation increase in prior media blame towards local government (approximately 79 posts) significantly increases the odds of users shifting blame towards local authorities. As hypothesised, earlier media blame directed at state or federal governments significantly decreases the odds of users shifting blame towards local government, with federal blame showing a substantially larger effect size. Notably, political actors are significantly less likely to shift blame towards local government, a contrast to their behaviour in Model 3 on state-directed blame.

4.7 Media Blame and Political Learning

The logistic regression results broadly support my hypotheses, with some nuances. Prior media blame influences citizens' blame attribution patterns, primarily by indicating which actors should not be blamed, which is taken up by Facebook users. Furthermore, when media coverage attributes blame to a specific actor, users become more likely to shift their blame toward that same actor and less likely to redirect blame elsewhere. These findings support the argument that social media and media reporting on such platforms foster political learning by reinforcing patterns of blame attribution. The cumulative impact of these effects should also not be underestimated, particularly in social media environments where users actively engage with content and amplify messages, including news items (Trilling et al., 2017). Furthermore, algorithmic structures reinforce these dynamics by curating user timelines based on their interests and social networks, exposing them to more content that aligns with their prior engagement (DeVito,

2017; van der Velden & Loecherbach, 2021). Given that an increasing number of citizens rely on social media rather than traditional news sources for information (Newman et al., 2024), these mechanisms intensify the importance of social media in the attribution of public blame and political learning.

Along the same lines, this chapter also highlights the importance of quality journalism and media reporting, which can be extrapolated to social media. Since crises are often unexpected, their interpretation emerges simultaneously from different directions. Hence, as events unfold sequentially, any knowledge to factually report them is limited, especially at the beginning. Misrepresentation and misunderstandings of crises by news media, while not uncommon, can have drastic consequences on how audiences interpret the same crises (Bennett et al., 2008). The same also applies to citizens, who are likely to come across misinformation and isolated blame attributions during such events, especially in the beginning when emotions are high and episodic frames dominate (De Vreese, 2005; Iyengar, 1991). Knowing that changes in such misrepresentations and potential corrections of previous inaccuracies can have an effect on users' opinions underlines the critical role of reporting.

A key finding is that not all levels of government are equally affected by prior media blame, raising important questions about how individuals assign responsibility and how government actors are held accountable. The regression results indicate that previous media blame increases the likelihood of users blaming the federal government, but also that this effect is not significant for state or local governments. While this might be a consequence of citizens initially assigning responsibility towards the federal government, particularly if only little information is known (Achen & Bartels, 2016; Atkeson & Maestas, 2012; Bucher, 1957; Canales et al., 2019; Malhotra et al., 2008), the discrepancy in responsibility attribution can have critical implications for political accountability. If the federal government disproportionately absorbs public blame, this could obscure the responsibilities of lower levels of government, potentially distorting public perceptions of governance effectiveness and crisis management.

Moreover, this opens up the broader debates on accountability and the impact of social media. Besides the already often sensationalist and emotional reporting of crises (De Vreese, 2005), research has also shown that social media makes accountability processes more personal

and direct, emphasising the person behind the actor instead of focusing on their role (Kuipers & Brändström, 2020). Photographs and reports of key actors in the aftermath of crises that go viral on social media platforms can have immediate effects on the popularity of political actors, potentially resulting in their resignation irrespective of their role in the aftermath of the crisis. An example of the case study would be Armin Laschet, the then CDU chancellor candidate for the 2021 German national election, who was photographed laughing at the location of the disaster. This photograph went viral on social media and might have had serious consequences for his career (Barthels et al., 2021; El Ouassil, 2021).

In this direction, biases in blame attributions can also be decisive in an election (Neugart & Rode, 2021), especially if one occurs shortly thereafter, as was the case for this disaster. The underlying mechanism of democracy is that citizens are able to reasonably identify the successes and failures of politicians and then reward or punish them through elections, as outlined in the seminal work by Key (1966). Future research should further explore how institutional arrangements and political communication strategies influence this uneven distribution of blame.

Finally, the findings suggest that political actors exhibit greater flexibility in their attribution of blame, meaning they are more likely to alter whom they are assigning blame to. On the one hand, this could reflect a higher level of political knowledge, as political actors are often closer to sources of information and, therefore, better equipped to make informed judgements. However, this finding might also be a result of blame games that are widely captured in literature on blame attribution by political actors (Hood, 2010; Maestas et al., 2008). This could potentially perpetuate the previously mentioned misconceptions and hinder the political learning of citizens.

4.8 Conclusion

This chapter investigates the role of blame attribution by media organisations on how citizens assign blame to different levels of government in a federalist system following the 2021 Ahrtal floods in Germany. Using a localised and open Large Language Model (LLM) to classify blame attribution in approximately 50,000 Facebook posts, I examine how blame attribution evolved

and whether it was influenced by media narratives. Logistic regressions are used to assess the relationship between previous media blame attribution, Facebook users' blame attribution, and shifts in blame attribution.

The findings provide strong evidence that prior media blame attribution significantly influences how citizens assign responsibility. The results confirm the first hypothesis, showing that media narratives strongly shape public perceptions of blame, with users being more likely to attribute responsibility in alignment with media discourse. Furthermore, the results partially support the second hypothesis, demonstrating that media blame impacts shifts in responsibility attribution, especially for the federal government. More importantly, I also show that users are less likely to shift their blame towards actors if media reports attribute blame towards someone else. These findings highlight the dynamic nature of political accountability in crisis contexts and the key role of the media in shaping blame attributions.

These insights contribute to the broader debate on crisis communication and public accountability in federal systems. They highlight that political learning is not uniform, but varies, and stress the need for a deeper understanding of its mechanisms. The results align with existing theories of motivated reasoning and public opinion formation, reinforcing the argument that citizens rely on external information to process accountability in complex governance systems (Lupia, 1994; Vettehen et al., 2008), also on social media. In addition, this study underscores the importance of transparent and proactive political communication in the management of crises, as evolving media narratives can significantly impact public trust in institutions (Reinhardt, 2015).

Although this study has shown that citizens initially tend to assign responsibility to the federal government and that media reporting does not influence changes in blame attribution evenly, it also offers a more nuanced perspective to Achen and Bartels's (2016) argument of blind retrospection, meaning that voters often misattribute blame for events beyond political leaders' control. It seems that even if voters only have a vague understanding of a government's actions, they still rely on heuristics from professionals such as journalists. The question is now how to ensure that citizens remain exposed to such heuristics and that they remain as factually correct as possible.

Finally, there are also several limitations that need to be kept in mind. First, even though cumulative exposure is promoted by social media algorithms and has a significant effect on political learning, it is not possible to clearly isolate a link between users blaming certain government actors and their exposure to a specific post by a media organisation. Furthermore, since this study focused on a specific disaster in Germany and the country's specific multilevel structure, it might not be fully generalisable to other cases due to Germany's specific political setup (Tomuschat, 2013) and the context of the Ahrtal floods in 2021. Future research should explore how different types of crises, also beyond natural disasters, impact blame attribution in federal systems. For example, political scandals or economic downturns may trigger different patterns of blame attribution that require further investigation. Finally, exploring how partisan media and algorithmic content curation on social media shape blame attribution could provide deeper insights into the role of information ecosystems in political accountability.

While this study does not settle the question of whether social media does more harm than good, the findings underscore its significance. Quality journalism remains indispensable in shaping informed public discourse and countering misinformation, even within digital spaces (Van Aelst et al., 2021). In addition, research on the effects of social media on democratic processes is necessary to understand the challenges posed by these platforms. As social media continues to shape public perceptions, understanding its effects remains crucial.

Chapter 5 Conclusion

This doctoral dissertation underscores the importance of social media when examining political (crisis) communication. Each of the three research questions addressed in the empirical chapters covers different key aspects of political communication research, with a focus on both the supply and demand of social media communication. More importantly, they also demonstrate the breadth of how political actors and citizens can interact on social media, each with their own distinct consequences. Using text analysis and three different case studies, I aimed to address the following research questions:

- Chapter 2: How do governments communicate issues related to the climate crisis on social media, and how do users react to such content?
- Chapter 3: How do crises affect political parties' issue diversity and communication strategies across online and offline media platforms?
- Chapter 4: How does media reporting affect people's blame attributions on social media, particularly in multilevel governance systems?

Before I turn to the main findings, it is important to note that this dissertation has exclusively focused on liberal democratic contexts. There exists an increasing body of research addressing the role of social media in non-democratic and authoritarian societies, emphasising the myriad ways in which online ecosystems help authoritarian leaders to remain in power and

exert control through misinformation, censorship, propaganda, information flooding, and online manipulation (Gohdes, 2014; Roberts, 2018). Beyond these specific settings, social media has also been used to undermine institutions in democratic settings (Tucker et al., 2017). It presents challenges to the quality of democratic discourse (Habermas, 2023) and outsourcing the public sphere to privately owned social media platforms is questionable at best, especially considering the recent developments of X (formerly Twitter) and Facebook during and after the 2024 US presidential election (Guiao, 2024; Mondon & Farkas, 2025; Paul et al., 2025; Sethi, 2025). However, the mechanisms, processes, and implications behind this differ strongly from non-democratic contexts and thus should be investigated separately.

5.1 Social Media Matters

The main findings of my dissertation can be summarised in three words: social media matters. Each empirical chapter shows that political communication has distinct and significant patterns, as well as specific impacts on and through social media. Despite the different research subjects, all three chapters also reveal a fundamental tension between algorithmic curation and democratic goals: government communication that prioritises transparency receives less engagement (Chapter 2); parties communicate differently during crises depending on the communication channel and its structure (Chapter 3); and citizens' blame attributions are influenced by media reporting but with uneven effects across levels of government (Chapter 4). These patterns suggest that social media platforms introduce structural biases in political communication that operate independently of actor intentions or ideological positions. Beyond these commonalities, this section provides an overview of the main findings of my empirical chapters before turning to their implications for political science and communication science research, as well as for practitioners.

The first empirical chapter highlights the complex relationship between communication logics, engagement patterns, and environmental communication strategies in governments' communication on environmental issues. I identify three communication styles (*Formal Institutional Communication, Strategic Policy Advocacy*, and *Symbolic Leadership*) that reflect

broader strategic choices in governmental communication, rather than being strictly tied to ideology or specific environmental issues. This suggests that governments approach social media communication in a manner that transcends policy-specific debates. Instead, their communication patterns are characterised by stylistic elements and are also influenced by issue-specific external factors. It also suggests that governments' communication might be similarly subject to constraints and demands, resulting in coherent patterns across countries.

The relatively minor role of left-right positioning in shaping these styles reinforces existing research that ideological divides do not fully explain variations in environmental communication (Huber, 2020; Lockwood, 2018). Instead, environmental topics may serve as a valence issue for governments, compelling them to address such concerns irrespective of party ideology. This dynamic underscores the necessity of understanding how governments use social media not only to convey policy but also to maintain legitimacy and responsiveness. Additionally, the study demonstrates that these communication styles influence social media engagement differently, with symbolic acts driving more positive interactions than purely informational posts. Users are less engaged with service statements and more technocratic updates, preferring content that employs action-oriented and self-referential language.

Given that social media algorithms amplify engagement-driven content, these findings have important implications for governmental outreach and crisis communication. If governments seek to maximise exposure for critical information, they may need to adapt their strategies to align with user preferences while ensuring accuracy and transparency. From a broader perspective, this chapter also demonstrates the tensions introduced by social media between democratic transparency and a communication whose success is based on engagement metrics, which can potentially undermine citizens' access to substantive government information such as the service-related posts in the study.

While the previous chapter demonstrated patterns in government communication, Chapter 3 reveals similar strategic considerations in party communication. This study examines how German parties adjust their issue attention and agenda diversity in response to crises across communication channels, relying on the case of Russia's 2022 full-scale invasion of Ukraine. The analysis reveals that crises tend to broaden the scope of party communication. Further-

more, the study finds that the impact of crises on agenda diversity varies across communication channels.

Parliamentary debates, due to their structured nature, constrain diverging expansions of party agendas, leading to a uniform increase in agenda diversity for both government and opposition parties. In contrast, social media provides greater flexibility for opposition parties to maintain a broader issue agenda, while governing parties remain at the same level of agenda diversity as before the invasion, indicating that this could be a strategic consideration for party communicators. This supports previous research on the existence of parallel communication arenas, where institutional constraints shape agenda-setting dynamics differently across platforms (Ivanusch, 2025). These findings highlight the importance of analysing agenda competition across multiple empirical sources, as online and offline ecosystems operate under distinct strategic logics. It also raises concerns about how public discourse is increasingly fragmented across not only various online platforms but also offline ones, potentially creating 'parallel discourse universes'.

Lastly, the final empirical chapter investigates media blame attribution and its influence on public perceptions of government responsibility in a federalist system, specifically in the aftermath of the 2021 Ahrtal floods in Germany. The findings indicate that prior media blame increases the odds of users assigning responsibility to the same actor, particularly in the case of blame attributions towards the federal government. Similarly, media organisations' Facebook posts with specific blame attribution decrease the odds that citizens redirect responsibility to a different actor, misaligning with media reports. These results provide evidence for the role of social media in reinforcing patterns of blame attribution, suggesting that digital platforms facilitate political learning by shaping public perceptions over time.

Notably, not all levels of government are equally affected by media blame. While federal government blame attribution increases after similar media coverage, this effect is not statistically significant for state or local governments. This discrepancy raises important questions about the distribution of political accountability. If public blame is disproportionately assigned to the federal government, it may obscure the responsibilities of lower levels of government, potentially distorting voter evaluations of governance effectiveness. Given that blame attribu-

tions can influence electoral outcomes, future research should explore how institutional settings and political communication strategies contribute to these disparities.

Additionally, the study finds that political actors are more likely to assign responsibility, meaning they are more likely to shift their positions towards new objects of blame. This may indicate a higher level of political knowledge among elites, but it could also be a result of blame games that are widely captured in literature on blame attribution by political actors (Hood, 2010; Maestas et al., 2008). Considering prior research on political responsiveness, the findings raise questions about whether politicians adjust their blame attributions based on emerging facts or for political gain. Understanding these dynamics is essential for assessing how political elites navigate blame management and crisis response strategies.

5.2 Contribution

Besides the findings presented in the previous section, this dissertation also makes several notable contributions to the literature on political crisis communication and social media. Overall, this research advances our knowledge of governmental communication, crisis agenda-setting patterns, and citizen blame dynamics in the digital era. It underscores the importance of examining how institutional contexts, strategic considerations, and platform affordances shape political communication outcomes. Future studies should build on these findings by conducting comparative analyses across different crises, political systems, and digital platforms to further refine our understanding of contemporary political communication.

As platform fragmentation increases (Newman et al., 2024), further questions arise as to how, beyond text, short-form video content, such as in the case of TikTok or Instagram, shapes political communication during crises. Furthermore, more in-depth qualitative work examining how media effects, specifically framing effects on social media, affect how citizens assign responsibility in the aftermath of crises is crucial for understanding the role of media reporting in shaping public perception and accountability processes through social media platforms. Lastly, extending research on algorithmic effects (Gillespie, 2014; van der Velden & Loecherbach, 2021), longitudinal studies on how algorithmic changes affect communication patterns and cit-

izens' engagement with political actors on social media present a key area to understand the scope of how the underlying mechanisms of social media affect the reception of communication. The following paragraphs address each empirical chapter's contribution more specifically.

Conceptually, the three-logic model of social media communication in Chapter 2 offers a valuable theoretical framework for analysing not only government communication on social media, but also for understanding the communication patterns of other political actors such as politicians, institutions, or parties. The operationalisation of each of the logics contributes to a broader discussion on how these concepts can be measured. The recent developments of computational techniques to measure large text corpora have opened up a plethora of alternative options to approach questions of political science. Latent and abstract concepts can be measured in a variety of ways using text analysis, and systematic biases continue to be a key problem (Baden et al., 2021; Nicholls & Culpepper, 2021). However, returning to more 'traditional' techniques of natural language processing, such as Part-of-Speech tagging and using a combination of measurements, allows for more points in the analysis during which a researcher can validate the results.

For example, while language complexity has long been a central aspect of representative democracy (Powell, 2000), advances in text measurements have fostered a more recent debate on how language complexity can be measured and how it affects political processes (Kittel, 2025; Rauh, 2023; Tolochko, 2019; Tolochko et al., 2019).[1] Using an established formula of readability, I was able to compare its performance to other approaches and ensure its validity across countries and languages (see also Figure A.1 in the Appendix) instead of relying on a LLM to classify government communication. With this research, I hope to contribute to these debates by providing further evidence and case studies that can inform future research.

Another important contribution of this dissertation is the understanding that political parties adapt their communication strategies to specific communication outlets, offline and online, as presented in Chapter 3. Very recent research by Ivanusch (2025), which was published shortly before the submission of this dissertation, showed first indications of this relationship in the context of social media communication. Adding another social media platform (Facebook) to

[1]Also see the debate around the article by Schoonvelde et al. (2019) and validity concerns related to their measurement of linguistic complexity.

the mix provides a more nuanced understanding of how parties' communication has evolved in today's hybrid media environment (Chadwick, 2017), which covers a variety of communication channels with different agendas, constraints, and audiences.

Lastly, Chapter 4 underlines how social media can foster political learning processes for citizens, offering a more nuanced perspective on Achen and Bartels's (2016) the argument of blind retrospection. It also raises questions about how politicians use social media to communicate their own positions. Further research should address the role of blame games by politicians on social media and their effect on citizens' blame attribution. I also provide a case study of how LLM prompting techniques can expand the scope of political science research by including a larger number of observations and addressing latent concepts.

Despite the advances in computational text analysis, a major challenge of communication research remains the availability of data, as a large part of public discourse is nowadays happening on privately owned social media platforms. While it has been discussed for years that political communication, such as by parties, politicians, or other actors, differs depending on the social media platform (Bossetta, 2018; Kreiss et al., 2018; Stier et al., 2018), gaining access to them for cross-platform studies has been a challenge since the beginning and has only become more difficult with the closing of APIs. In addition, the role of offline communication arenas such as plenary speeches introduces a whole different set of questions regarding how communication overlaps with those different ecosystems. As mentioned in the Introduction, I hope to publish my Facebook datasets not only for reproducibility reasons but also to enable more cross-platform analyses.

5.3 Implications

Finally, the findings of my empirical chapters have important implications for practitioners, such as communication strategists, as well as for the broader understanding of social media's impact on democratic processes.

First, as demonstrated in Chapter 2, the characteristics of government communication – including language choice in Facebook posts, the inclusion of links, the text length, or various

external factors – create patterns of output that are significantly differently impacted by user engagement. This insight offers crucial guidance for governments and their social media strategists. The study reveals that users tend to engage less with informational and service-related posts, despite them often containing the most important messages from governments, such as emergency hotlines or policy updates. This creates a concerning disconnect. Information that facilitates citizens' political learning, which can also alter blame attributions as highlighted in Chapter 4, seems to fail to reach a broader audience. Echoing DePaula and Dincelli (2018), Mergel (2013b), and Zavattaro et al. (2015), for governments that are aiming to increase exposure for such critical content and to use social media effectively, a fundamental rethinking of social media content creation is necessary.

Second, this research underscores the vital importance of quality journalism and media reporting on social media platforms, particularly amid disruptive developments such as misinformation and fake news (Tucker et al., 2017). Chapter 4 demonstrates that online media consumption can significantly influence users' blame attributions and accountability processes. This finding becomes especially relevant considering that social media facilitates incidental exposure to content (Bakshy et al., 2015), making the quality of information on these platforms crucial. The situation is further complicated by recent decisions of social media platforms to discontinue their fact-checking policies (Paul et al., 2025), increasing the likelihood of exposure to false or misleading information. Given that social media remains a primary channel for news consumption (Newman et al., 2024) and citizens typically rely on heuristics to interpret their political reality (Lau & Redlawsk, 2001), quality journalism represents an essential bulwark against political misinformation. Moreover, breaking through homogeneous information streams with, for instance, investigative reporting is increasingly important in combating misinformation (Rhodes, 2021).

Moreover, these results underscore the critical need for comprehensive digital literacy initiatives. The impact of social media reporting on users' opinion formation and the abandonment of fact-checking policies by major platforms (Paul et al., 2025) emphasises the need for citizens' skills to critically evaluate information quality on social media. Governments should therefore consider investing in educational programmes that equip citizens with tools to iden-

tify misinformation, understand algorithmic curation, and recognise potential biases in online content. Such initiatives could be particularly effective when integrated into existing educational frameworks and public information campaigns. One model example is Finland, which has placed media literacy, critical thinking, and propaganda detection at the forefront of its school curricula (Gross, 2023). Digital literacy represents not merely a technical skill but a fundamental democratic competency, especially as the boundaries between traditional and social media continue to blur (Vraga et al., 2021). Improving citizens' capacity to evaluate information quality would strengthen democratic discourse and potentially reduce polarisation driven by low-quality information environments.

The final point I would like to underline takes a broader perspective. As mentioned throughout the dissertation, social media comes with advantages but also severe pitfalls and challenges for democracies. From the perspective of realising democracy's epistemic potential, the findings of the previous empirical chapters further highlight the tension between social media's potential to enhance democratic knowledge production and its current limitations in practice. Scholars such as Landemore (2012) and Estlund (2008) argue that democracy's ability to aggregate diverse perspectives and knowledge tends to enable people to make better decisions collectively, resulting in democracy having epistemic value. Due to social media, information has become more accessible, and a larger variety of voices can be heard compared to before, bypassing hegemonic gatekeepers. Although Chapter 4 offers perhaps the most optimistic findings from an epistemic democracy perspective, my results suggest a more concerning relationship between epistemic goals and platform architecture, between informational quality and algorithmic curation.

To achieve the epistemic potential of democracy – that is, the ability for democratic societies to make well-informed, collective decisions – my findings highlight two key problems.

First, the way citizens get their information is heavily shaped by algorithmic curation, which often prioritises engagement over accuracy or diversity of views. Although social media was initially heralded as a solution to the challenges of information provision (Song & Lee, 2016; Warren et al., 2014), Chapter 2 shows that despite easy access, incidental exposure, and broad dissemination of information, details about government activities do often not reach or engage

citizens, whether due to algorithmic constraints or lack of interest. The concept of 'attention economy' (Tufekci, 2017) further illustrates this tension between engagement and epistemic value, an environment in which key government information needs to compete for citizens' limited attention.

Second, social media has resulted in a fragmented public sphere, where people are divided across many different communication channels rather than coming together in a shared space for open, reasoned debate, as already observed by Habermas (2023). The existence of multiple simultaneous party agendas across communication channels, as found in Chapter 3 further supports this observation. These different communication channels seem to create loosely connected knowledge arenas instead of a shared informational basis for democratic decision-making and political learning. Since citizens are more likely to encounter political information on social media than from plenary speeches, this can create an asymmetric information environment, particularly considering how crises disrupt parties' agendas across online and offline channels in distinct ways.

I do not want to imply here that technological advancement is the root of all epistemic problems; instead, I believe it is how we use these technologies, how they are interpreted and integrated into our public sphere. To resolve conflicts between social media and the epistemic potential of democracy, one step could be intentional design and regulation of such platforms (Benkler et al., 2018; Habgood-Coote, 2025). Recent regulatory initiatives, such as the European Union's Digital Services Act (European Commission, 2022) and Australia's Social Media Age Limit (The Office of Impact Analysis, 2024), represent early attempts to address the previously mentioned challenges. However, assessing whether such interventions meaningfully enhance collective knowledge production and democratic deliberation remains a complex empirical question that requires ongoing scholarly attention. The ultimate challenge lies in aligning platform architectures with epistemic values in ways that preserve innovation while supporting the foundations of democratic governance.

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Appendix A

A.1 Fine-tuning the BERT Model

Despite *distilroberta-base-climate-detector* being a classification model for detecting climate-related paragraphs, several posts have initially been falsely classified as positive. For instance, posts mentioning "heritage day" have been falsely classified as climate-related discourse. Additionally, posts that mainly focus on other topics such as the economy have also been falsely classified as climate-related. For the fine-tuning, I have randomly selected 2000 posts across actors and years, while paying attention to have an equal amount of positive and negative classification output by the pretrained model. Each of them has been manually checked and then used as a source for the fine-tuning. The fine-tuned model's overall F1 accuracy is 0.991, the recall score is 0.992, and precision lies at 0.989. The evaluation loss is at 0.042 with three epochs. The model can be found on Hugging Face (Wagner, 2024).

A.2 Case Selection

Table A.1: Overview of Facebook Accounts.

Country	Government Account	Head of Government Account	In office
Australia	yes	Abbot	18 September 2013 - 15 September 2015
		Turnbull	15 September 2015 - 24 August 2018
		Morrison	24 August 2018 - 23 May 2022
		Albanese	since 23 May 2022
Barbados	yes	Mottley	since 25 May 2018
Belgium	no	Michel	11 October 2014 – 27 October 2019
		Wilmes	27 October 2019 - 1 October 2020
Canada	no	Harper	6 February 2006 - 4 November 2015
		Trudeau	since 4 November 2015
Chile	yes	Piñera	11 March 2018 - 11 March 2022
		Boric	since 11 March 2022

Costa Rica	yes	Solís	8 May 2014 - 8 May 2018
		Quesada	8 May 2018 - 8 May 2022
Czechia	yes	Babiš	13 December 2017 - 17 December 2021
		Fiala	since 17 December 2021
Denmark	yes	Thorning-Schmidt	3 October 2011 – 28 June 2015
		Rasmussen	28 June 2015 - 27 June 2019
		Frederiksen	since 27 June 2019
Estonia	yes	Ratas	23 November 2016 - 26 January 2021
		Kallas	since 26 January 2021
Finland	yes	Stubb	24 June - 29 May 2015
		Rinne	6 June 2019 - 10 December 2019
		Marin	10 December 2019 - 20 June 2023
		Orpo	since 20 June 2023
France	yes	Hollande	15 May 2012 - 14 May 2017
		Macron	since 14 May 2017
Germany	yes	Scholz	since 8 December 2021
Iceland	yes	Gunnlaugsson	23 May 2013 - 7 April 2016
		Jóhannsson	7 April 2016 - 11 January 2017
		Benediktsson	11 January 2017 - 30 November 2017 & since 9 April 2024
		Jakobsdóttir	30 November 2017 - 9 April 2024
Ireland	yes	Varadkar	14 June 2017 - 27 June 2020 & 17 December 2022 - 9 April 2024
		Martin	27 June 2020 - 17 December 2022
		Harris	since 9 April 2024
Italy	yes	Renzi	22 February 2014 - 12 December 2016
		Gentiloni	12 December 2016 - 1 June 2018
		Conte	1 June 2018 - 13 February 2021
		Meloni	since 22 October 2022
Latvia	yes	Kariņš	23 January - 15 September 2023
		Siliņa	since 15 September 2023
Luxembourg	yes	Frieden	since 17 November 2023
		Bettel	4 December 2023 - 17 November 2023
Netherlands	yes	Rutte	since 2010
Norway	yes	Solberg	16 October 2013 - 14 October 2021
		Støre	since 14 October 2021
New Zealand	no	English	12 December 2016 - 26 October 2017
		Ardern	26 October 2017 - 25 January 2023
		Hipkins	25 January 2023 - 27 November 2023

		Luxon	since 27 November 2023
Seychelles	yes	Ramkalawan	since 26 October 2020
		Faure	16 October 2016-26 October 2020
Spain	yes	Rajoy	21 December 2011 - 2 June 2018
		Sánchez	since 2 June 2018
Sweden	no	Löfven	3 October 2014 - 30 November 2021
		Andersson	30 November 2021 - 18 October 2022
		Kristersson	since 18 october 2022
United Kingdom	yes	Cameron	11 May 2010 - 13 July 2016
		May	13 July 2016 - 24 July 2019
		Boris Johnson	24 July 2019 - 6 September 2022
		Truss	6 September 2022 - 25 October 2022
		Sunak	since 25 October 2022
USA	yes	Obama	20 January 2009 - 20 January 2017
		Trump	20 January 2017 - 20 January 2021
Uruguay	yes	Lacalle Pou	since 1 March 2020

A.3 Readability Score Measurement

In this section, I compare several widely used readability measures. These measures are calculated on both the original Facebook posts in their native languages and their translations into English to assess how readability differs between languages and translations. The languages represented in this dataset include, among others, English, German, Swedish, and Spanish, which makes accurate measures more complex. The readability measures evaluated are LIX (Björnsson, 1968), RIX (a similar index with a different threshold for word length) (Anderson, 1983), the Coleman-Liau Index (CL) (Coleman & Liau, 1975), the Automated Readability Index (ARI) (Kincaid & Delionbach, 1973), and the Flesch-Kincaid readability tests (FK) (Schoonvelde et al., 2019).

The heatmap presented in Figure A.1 shows Pearson's correlation coefficients between these readability measures, calculated for both original and translated texts. The posts represent a subsection of the original data, as for some of the measures at least 100 words are required for measurement. Several key observations emerge from this analysis.

The readability measures applied to the original texts in various languages generally show strong positive correlations with each other. For example, Flesch-Kincaid shows a notably high correlation with both LIX and RIX, at 0.71 and 0.7, respectively. This correlation increases to 0.89 for both when using translated posts as the base, which is expected given that Flesch-Kincaid was designed specifically for the English language. These consistently high correlations suggest that, despite being developed for different languages and purposes, these measures tend to produce similar results when applied to translated texts, indicating that they capture comparable aspects of text complexity. For the purposes of this study, I have chosen to rely on LIX, as there is no need to aggregate posts into broader categories

such as those spanning multiple years or cabinets. Moreover, I can apply LIX directly to the original posts after removing any URLs, avoiding the language limitations inherent in English-specific measures. LIX has proven effective in other languages, including French and German (Anderson, 1983), allowing for a more nuanced approach to evaluating readability.

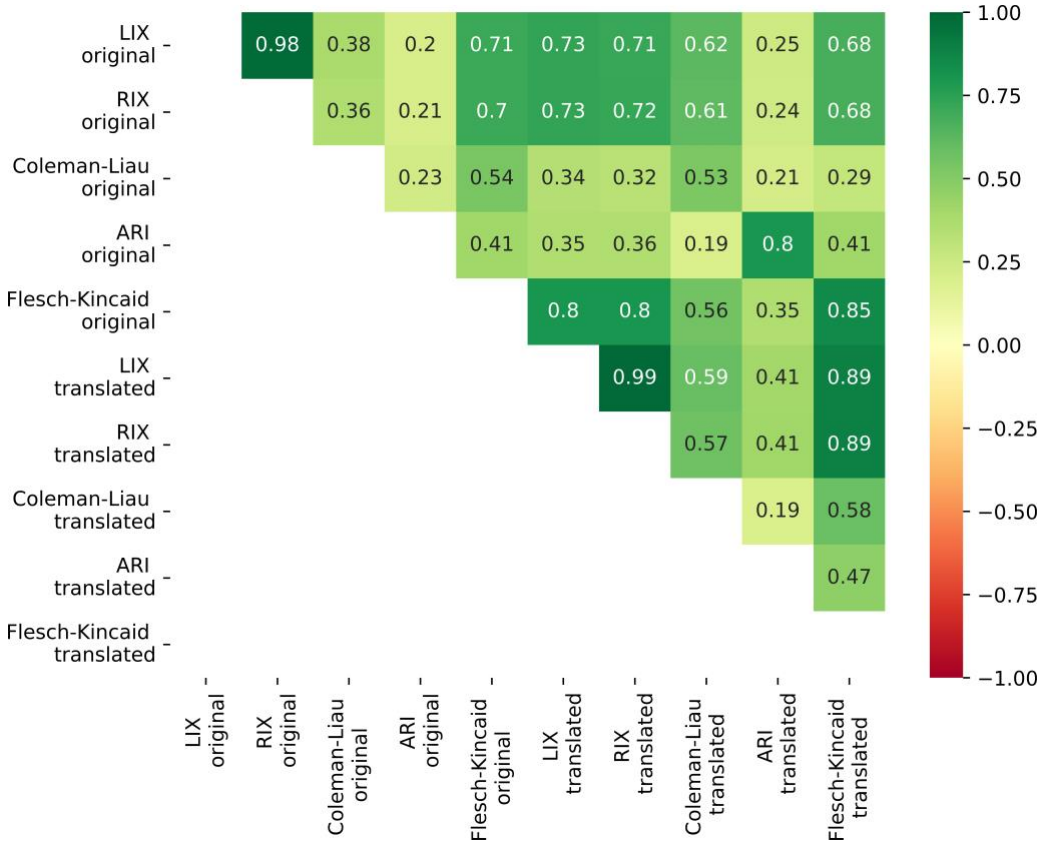

Figure A.1: Correlation of readability measurements for original language and translated posts.

A.4 Overview of Clusters

Table A.2: Descriptive Quantitative Variables for all Cluster with standardised variables.

Variable	v.test	Mean in Category	Overall Mean	SD in Category	Overall SD	p-value
Cluster 1: ***Formal Institutional Communication*** (11989 Observations)						
Climate Vulnerability	96.33	0.62	-0.00	0.83	1.00	0.00
Readability	52.67	0.34	-0.00	1.04	1.00	0.00
Multimodality	39.89	0.26	-0.00	0.15	1.00	0.00
External Links	18.29	0.12	-0.00	1.05	1.00	0.00
Left-Right Placement	3.65	0.02	-0.00	0.75	1.00	0.00
Mentions of Summits	-20.57	-0.13	-0.00	0.92	1.00	0.00
Ceremonial Language	-23.87	-0.15	0.00	0.15	1.00	0.00
Pro-Environment	-24.78	-0.16	-0.00	0.76	1.00	0.00

Variable	v.test	Mean in Category	Overall Mean	SD in Category	Overall SD	p-value
Tonality	-25.81	-0.17	-0.00	0.95	1.00	0.00
Text Length	-27.74	-0.18	0.00	0.67	1.00	0.00
Post Intervals	-49.63	-0.32	0.00	0.42	1.00	0.00
Action Orientation	-64.15	-0.41	0.00	0.88	1.00	0.00
Self-References	-75.82	-0.49	0.00	0.75	1.00	0.00
Environment Protection Expenditure	-97.98	-0.53	-0.06	0.53	0.76	0.00
Cluster 2: *Strategic Policy Advocacy* (9863 Observations)						
Environment Protection Expenditure	88.55	0.46	-0.06	0.63	0.76	0.00
Self-References	65.05	0.50	0.00	0.98	1.00	0.00
Action Orientation	54.92	0.42	0.00	0.94	1.00	0.00
Post Intervals	49.86	0.38	0.00	1.35	1.00	0.00
Multimodality	33.90	0.26	-0.00	0.07	1.00	0.00
Tonality	26.54	0.20	-0.00	0.98	1.00	0.00
Mentions of Summits	22.10	0.17	-0.00	1.08	1.00	0.00
Pro-Environment	20.84	0.16	-0.00	1.21	1.00	0.00
Text Length	18.90	0.15	0.00	1.14	1.00	0.00
Left-Right Placement	-2.05	-0.02	-0.00	1.18	1.00	0.04
External Links	-8.70	-0.07	-0.00	0.97	1.00	0.00
Ceremonial Language	-20.35	-0.16	0.00	0.00	1.00	0.00
Readability	-45.70	-0.35	-0.00	0.83	1.00	0.00
Climate Vulnerability	-85.83	-0.66	-0.00	0.67	1.00	0.00
Cluster 3: *Symbolic Leadership* (1963 Observations)						
Ceremonial Language	79.85	1.73	0.00	2.96	1.00	0.00
Self-References	21.32	0.46	0.00	0.99	1.00	0.00
Environment Protection Expenditure	19.54	0.26	-0.06	0.59	0.76	0.00
Action Orientation	18.26	0.39	0.00	0.92	1.00	0.00
Text Length	16.59	0.36	0.00	1.56	1.00	0.00
Pro-Environment	7.73	0.17	-0.00	0.97	1.00	0.00
Mentions of Summits	-2.18	-0.05	-0.00	0.97	1.00	0.03
Left-Right Placement	-2.98	-0.06	-0.00	1.28	1.00	0.00
Readability	-13.90	-0.30	-0.00	0.84	1.00	0.00
External Links	-17.66	-0.38	-0.00	0.70	1.00	0.00
Climate Vulnerability	-21.40	-0.46	-0.00	0.92	1.00	0.00
Multimodality	-133.23	-2.88	-0.00	1.71	1.00	0.00

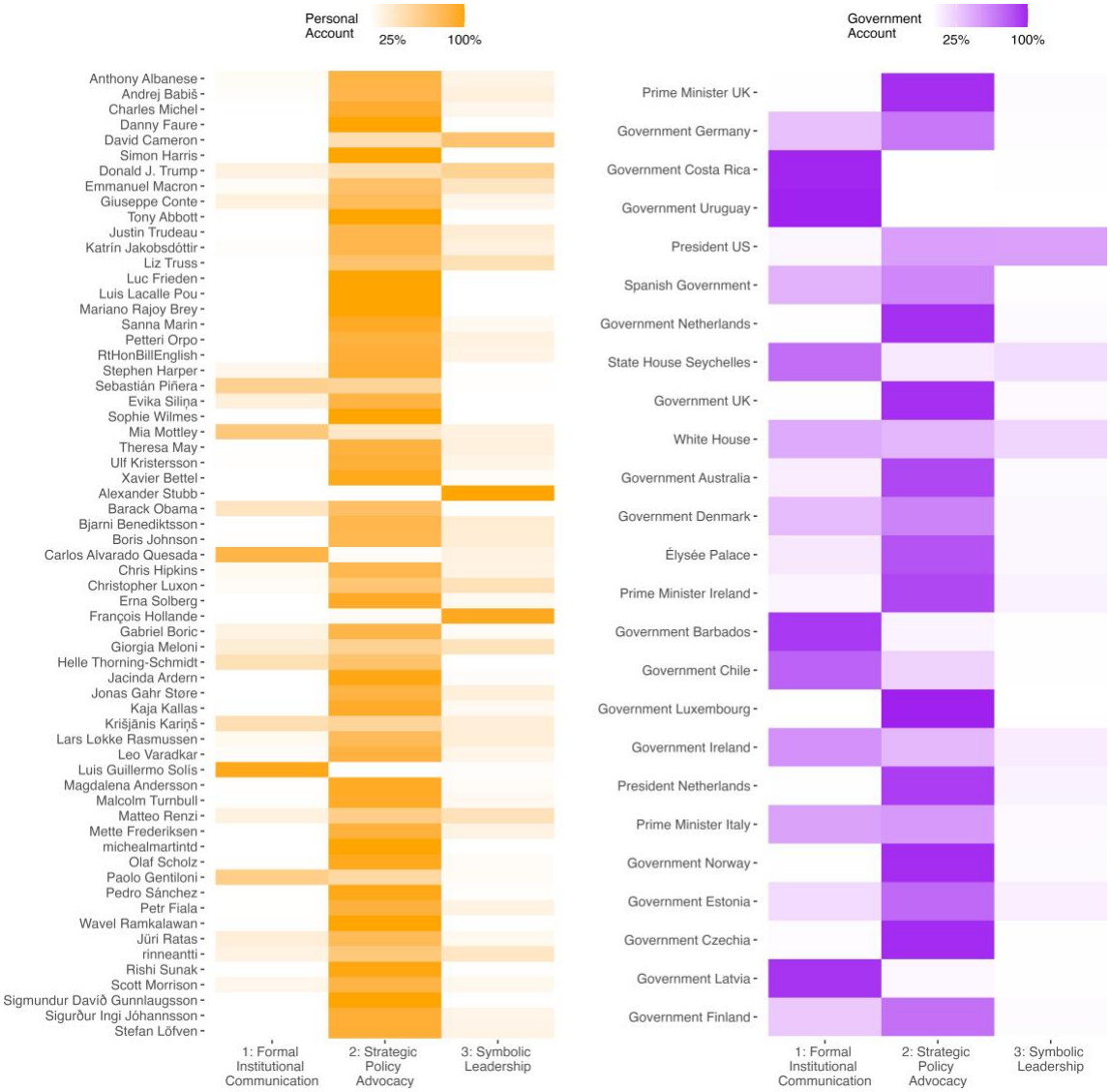

Figure A.2: Overview of cluster distribution along governments and politicians.

A.5 Robustness Check

I present here an alternative cluster analysis to further assess the robustness of the main findings in my study, which explores how governments communicate environmental issues on social media. While my argument posits that the combination of all logics – logic of platform, logic of issue, and logic of actor – results in the final output of communication, the dual nature of stylistic elements and external elements that are pertinent to the issue creates an analytical challenge when discussing causality. In my case, it raises the question: do vulnerable countries communicate in a particular way because of their vulnerability, or does the clustering algorithm simply group them together because vulnerability was an input variable?

To assess whether the observed patterns are primarily driven by communication style or

by external factors such as vulnerability and ideology, I present a robustness check using an additional cluster analysis that separates the communication style variables from the external variables. More precisely, this cluster analysis was conducted in the same way but without the following external variables: Climate Vulnerability, Environmental Protection Expenditure, Left-Right Placement, and Pro-Environment Placement. The overlaps in the different measures are shown in Table A.3.

		Only Stylistic Clusters		
		1	2	3
Original Clusters	1	**10348**	1632	9
	2	2649	**7214**	0
	3	32	10	**1921**

Table A.3: Comparison of cluster membership between original analysis (with external factors) and style-only analysis (number of posts in each cluster)

Although there are some divergences, especially regarding Clusters 1 and 2, the new measure excluding external factors retains the core structure of the original clusters and continues to align with the three main categories discussed in the study. Additionally, to evaluate the consistency and robustness of the clustering results, I computed the Adjusted Rand Index (ARI) between the two cluster solutions. The ARI value of 0.46 suggests a moderate level of agreement between the two cluster assignments. This result indicates that, while there are differences between the two clusterings, the overall structures identified in both analyses are not entirely dissimilar. External factors do play a meaningful role in shaping governments' communication patterns, but they are not entirely deterministic.

Lastly, for qualitative validation, I have also analysed to which degree the representative examples of Facebook posts for each cluster presented in Table 2.2 remain in the same cluster or have moved to a different one. All three examples – one for each cluster – remain in the same cluster when excluding all external factors and only keeping the stylistic elements. With this, I conclude that despite some variation, the original cluster analysis is not driven by external factors only. This also confirms the theoretical argument that the interplay of the three different logics creates specific communication patterns.

Appendix B

B.1 Data Overview

Table B.1: Issue distribution across parties

	AfD	B90/Die Grünen	FDP	Left	SPD	Union	Total
Agriculture	22	8	6	8	14	22	80
Culture	13	4	3	3	5	7	35
Defence	51	19	31	64	36	85	286
Democracy	127	55	90	36	129	192	629
Economy	103	44	121	59	81	140	548
Education	9	5	21	6	12	19	72
Environment	50	51	11	19	44	64	239
Equality	78	49	42	125	76	60	430
European Union	19	5	17	1	17	18	77
Foreign Affairs	65	63	59	46	155	135	523
Freedom	122	14	38	28	23	52	277
Immigration	87	18	45	18	63	108	339
Labour	15	15	19	48	50	25	172
Law and Order	36	14	11	14	16	55	146
Political System	76	24	41	30	47	103	321
Society and Values	42	24	35	7	35	88	231
Technology and Infrastructure	22	25	48	15	36	73	219
Welfare State	106	29	75	96	102	106	514
Total	1043	446	713	623	941	1352	5118

B.2 Classification Mechanism

Following Ivanusch (2025), I penalise the probability of political authority and political system, as parties frequently tend to express criticism towards others or address administrative efficiency or reforms in the context of other political issues, resulting in an overestimation of this category by the model. Additionally, I excluded any Facebook post with fewer than five words and any Parliament speech with fewer than 25 words, as those tend to not include policy-relevant information. Table B.2 shows examples of both Facebook and Parliament documents and their respective classification.

Table B.2: Classification examples (translated from German to English)

Text	Channel	Issue Classification	Issue Category
"We must consistently oppose all forms of fascism, racism and anti-Semitism." (The Left, 27/01/2021)	Facebook	503 - Equality: Positive	Equality
"The government has no opinion on compulsory vaccination. This is an appalling lack of leadership on such an elementary issue of combating the pandemic. It doesn't help that the Minister of Health wants to vote in favour of compulsory vaccination as a member of parliament. The traffic lights must finally present a bill!" (CSU, 14/01/2022)	Facebook	504 - Welfare State Expansion	Welfare State
"In other words, they shunt demonstrably healthy people to the visitors' gallery at the top, where they cannot be seen by other MPs. These MPs are therefore practically banned from the chamber, separated from the community of all MPs and thus victimised. With your corona policy, you are not only dividing society; you are also dividing this Parliament, ladies and gentlemen." (CDU, 12/01/2022)	Parliament	304 - Political Corruption	Political System
"How many Federal Police officers are deployed at the 28 largest foreign airports to check passports and prevent potential asylum seekers from entering Germany (please list by airport)? Mrs State Secretary." (The Left, 06/04/2022)	Parliament	201 - Freedom and Human Rights	Freedom

Appendix C

C.1 Ollama - LLM Classification

To train the model to detect blame attribution in Facebook posts, I used a few-shot prompting technique. The model was given a series of examples where it learned to classify whether a post contains blame, identify the object of the blame, classify the degree of blame, and provide a short description of the blame. This approach allows the model to generalise from a few specific instances to accurately categorise new posts related to the context of floods.

Prompt: You are an expert in text classification and responsible for detecting blame attribution in social media posts related to the 2021 Ahrtal floods. Follow these steps to determine whether blame is present and, if so, classify it correctly.

1. Step 1: Identify Signals of Blame: Check the text for:
    - Causal statements (e.g., "because of," "due to," "as a result of")
    - Responsibility terms (e.g., "accountable," "responsible for," "should have prevented")
    - Action demands (e.g., "must," "should," "need to").
    - Negative consequence statements that imply failure or wrongdoing.

    If none of these are present, the post likely does not contain blame.

2. Step 2: Determine Object(s) of Blame (if applicable): If blame is detected, identify who is blamed:
    - Federal Government (e.g., "Berlin," "Chancellor", "traffic light coalition")
    - State Government (e.g., "Rhineland-Palatinate government")
    - Local Government (e.g., "mayor", "local administration")
    - Politician (e.g., "Malu Dreyer", "Robert Lewentz")
    - Others (e.g., individuals, NGOs, companies, media).

If no clear blame target is present, return **None** and if multiple blame targets are present, separate by comment (e.g. "State Government, Politician").

3. Step 4: Return JSON Output: Format the response strictly as JSON. If no blame is found, return: "Blame": "No", "Object_of_Blame_General": None, "Degree_of_Blame": None

Examples:

Example 1:

Content: "In parts of Germany, it's land under water. In many places, people are desperately fighting the floods and hoping for an end to the rainfall. What else could they hope for? For support from a government that has already abandoned those affected by the flood disaster in the Ahr valley for over two years? On a traffic light that has cut funding for civil protection and disaster relief by 20 per cent for this year? I am simply stunned by this stupid and short-sighted policy!"

Output: {"Blame": "yes", "Object_of_Blame_General": "Federal Government", " Degree_of_Blame": "Hard"}

Example 2:

Content: "Helpers in the Ahr Valley demand an apology from the state government."

Output: {"Blame": "yes", "Object_of_Blame_General": "State Government", " Degree_of_Blame": "Soft"}

Example 3:

Content: "Many thanks again to Martin and his great team for this important programme. The film was shot a few weeks ago - the situation is still as dramatic as shown here. Martin Ruetter has also made a very moving appeal on his Facebook page. You can just tell how close the experiences in the Ahr valley are to his heart. You can watch the episode here:"

Output: {"Blame": "no", "Object_of_Blame_General": null, "Degree_of_Blame": null}

Example 4:

Content: "+++ The Dreyer SPD is responsible for countless Ahr valley victims! +++ The SPD of all parties is instrumentalizing the Ahr Valley disaster for the budget debate. The SPD Minister-President of Rhineland-Palatinate, Malu Dreyer, in particular bears a considerable share of the blame for the many deaths. Stephan Brandner, deputy

federal spokesperson for the AfD and member of the Bundestag, has clear words on this despicable SPD behaviour."
Output: {"Blame": "yes", "Object_of_Blame_General": "State Government, Politician", "Degree_of_Blame": "Hard"}

Example 5:

Content: "Funny .... the article is from August and was uploaded again today."
Output: {"Blame": "no", "Object_of_Blame_General": null, "Degree_of_Blame": null}

C.2 LLM Performance

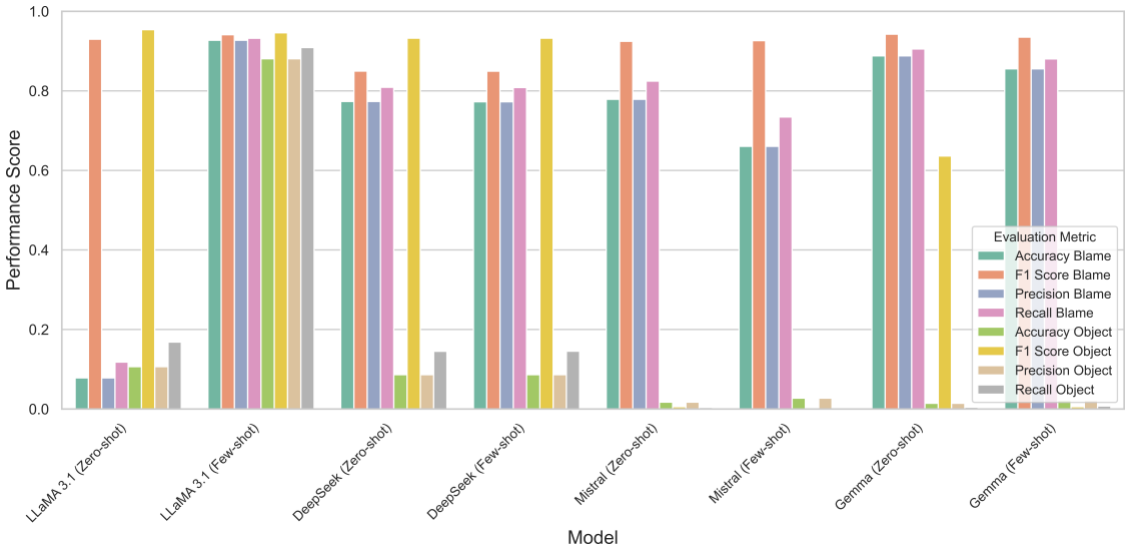

Figure C.1: LLM model performance for classifying blame occurrence and object of blame.

C.3 Robustness Checks

To assess the sensitivity of the findings to the time window of three days, I conducted two sets of robustness checks using an extended window of five days as well as a reduced window of one day for media blame attribution. For the extended window of five days, the results largely confirm the findings of the main analysis: besides a change in the size of coefficients, their significance and direction of relationships remain the same. The main difference for both adjusted regressions are that *Days since Disaster* loses its statistical significance for all models as presented in Tables C.1 and C.3. In addition, the R^2 increases for each model.

The second set of robustness checks using a smaller window of one day prior media blame attribution shows similar results. Again, the significance and direction of relationships are consistent with the initial analysis. Contrary to the extended window, *Days since Disaster* has become more significant, which is not surprising, though. The main difference can be found in Table C.4. The effect of prior media blame towards the local government on users shifting towards the federal government or the state government has lost its statistical significance. The direction of the coefficient, however, remains the same. Similarly, prior media blame towards the state government also bears no significance anymore. However, the direction has changed to positive, but the coefficient size is near zero. Overall, these robustness checks suggest that while the temporal proximity of blame attribution to the disaster itself matters, the particular choice of a three-day window does not fundamentally alter the findings.

Table C.1: Log-odds from Firth's penalised logistic regression with scaled and centred predictors, estimating the effect of media blame (t–5) on blame attribution.

	DV: Blame towards		
	Fed. Gov.	State Gov.	Local Gov.
	(1)	(2)	(3)
Media blaming Local Gov. (t-5)	−8.609***	−0.296	7.857
	(1.161)	(0.130)	(0.621)
Media blaming State Gov. (t-5)	−7.098***	1.103	−0.633
	(0.565)	(0.075)	(0.184)
Media blaming Federal Gov. (t-5)	9.160***	−0.490***	−1.428***
	(0.621)	(0.061)	(0.203)
Political Actor	−0.659***	1.158***	−0.762***
	(0.094)	(0.097)	(0.145)
Days since Disaster	0.117	0.090	−0.137
	(0.046)	(0.047)	(0.066)
Intercept	0.774***	−2.026***	−0.853***
	(0.284)	(0.077)	(0.139)
Num.Obs.	2478	2478	2478
R2	0.463	0.260	0.303
RMSE	0.37	0.36	0.27

*Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$*

Table C.2: Log-odds from Firth's penalised logistic regression with scaled and centred predictors, estimating the effect of media blame (t–1) on blame attribution.

	DV: Blame towards		
	Fed. Gov.	State Gov.	Local Gov.
	(1)	(2)	(3)
Media blaming Local Gov. (t-1)	−3.733***	−0.159	3.265
	(0.685)	(0.126)	(0.375)
Media blaming State Gov. (t-1)	−4.736***	2.205	0.009
	(0.542)	(0.181)	(0.053)
Media blaming Federal Gov. (t-1)	7.863***	−0.663***	−0.888***
	(0.629)	(0.106)	(0.189)
Political Actor	−0.683***	1.280***	−0.872***
	(0.088)	(0.108)	(0.140)
Days since Disaster	0.027	0.121*	−0.161*
	(0.043)	(0.051)	(0.064)
Intercept	1.558	−2.094***	−1.565***
	(0.160)	(0.090)	(0.094)
Num.Obs.	2478	2478	2478
R2	0.213	0.180	0.126
RMSE	0.43	0.37	0.29

*Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$*

Table C.3: Log-odds from Firth's penalised logistic regression with scaled and centred predictors, estimating the effect of media blame (t–5) on change of blame attribution.

	DV: Blame Change Towards			
	Any Gov.	Fed. Gov.	State Gov.	Local Gov.
	(1)	(2)	(3)	(4)
Media blaming Local Gov. (t-5)	0.541**	−22.404***	−16.894***	1.370***
	(0.207)	(6.717)	(7.145)	(0.264)
Media blaming State Gov. (t-5)	0.205*	−25.849***	0.947***	−19.304***
	(0.085)	(5.333)	(0.142)	(6.636)
Media blaming Federal Gov. (t-5)	−0.370***	0.020	−94.952***	−93.721***
	(0.073)	(0.059)	(16.103)	(17.934)
Political Actor	0.331**	0.235	0.560**	−0.672***
	(0.108)	(0.137)	(0.171)	(0.209)
Days since Disaster	0.099	0.117	0.162	−0.033
	(0.055)	(0.068)	(0.083)	(0.091)
Intercept	−0.288***	−9.348***	−34.143***	−32.918***
	(0.081)	(1.464)	(5.173)	(5.631)
Num.Obs.	1476	1806	2306	2373
R2	0.052	0.076	0.240	0.223
RMSE	0.49	0.34	0.25	0.20

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.4: Log-odds from Firth's penalised logistic regression with scaled and centred predictors, estimating the effect of media blame (t–1) on change of blame attribution.

	DV: Blame Change Towards			
	Any Gov.	Fed. Gov.	State Gov.	Local Gov.
	(1)	(2)	(3)	(4)
Media blaming Local Gov. (t-1)	2.121***	−2.290	−0.060	2.512***
	(0.780)	(1.606)	(0.162)	(0.381)
Media blaming State Gov. (t-1)	0.605**	−16.131***	2.194***	0.038
	(0.228)	(5.090)	(0.320)	(0.042)
Media blaming Federal Gov. (t-1)	−0.207**	0.104	−99.834***	−0.444*
	(0.071)	(0.064)	(23.285)	(0.160)
Political Actor	0.335**	0.131	0.726***	−0.677***
	(0.107)	(0.135)	(0.163)	(0.189)
Days since Disaster	0.128*	0.195**	0.262***	0.127
	(0.054)	(0.066)	(0.078)	(0.085)
Intercept	−0.147***	−3.264***	−23.398***	−2.452***
	(0.113)	(0.440)	(4.873)	(0.122)
Num.Obs.	1476	1806	2306	2373
R2	0.042	0.027	0.142	0.109
RMSE	0.49	0.35	0.26	0.21

*Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$*