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Research communication in the climate crisis

Open letters and the mobilization of information

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Carin Graminius

Research communication in the climate crisis

OPEN LETTERS AND THE MOBILIZATION OF INFORMATION

RESEARCH COMMUNICATION IN THE CLIMATE CRISIS

Research communication in the climate crisis

Open letters and the mobilization of information

CARIN GRAMINIUS



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Lunnahöja, August 2023
Carin Graminius

List of Articles

Article I

Gramini, C. (2020). Conflating scholarly and science communication practices: the production of open letters on climate change. *Journal of Documentation*, 76(6), pp. 1359-1375.

Article II

Gramini, C. (2021). Fast-food information, information quality and information gap: a temporal exploration of the notion of information in science communication on climate change. *Journal of Documentation*, 78(7), pp. 89-105.

Article III

Gramini, C. (2022). Research Communication on Climate Change through Open Letters: Uniting Cognition, Affect and Action by Affective Alignments. *Science as Culture*, 31(3), pp. 334-356.

Article IV

Gramini, C. (2023). Open letters and climate communication: The professional roles and identities of researchers in times of crisis. *Environmental Communication*, 17(6), pp. 537-549.

Article V

Gramini, C. (submitted). Publishing strategies and professional demarcations: enacting media logic in academic climate communication through open letters. *Communications*.

Introduction

Prelude: in the field

It is a sunny, pre-covid winter day in a busy Copenhagen, and the typical winter weather outside makes the topic of the conference I am attending slightly surreal: “The lost decade? Planning for the future. 2019 Climate Conference, Aalborg University, Copenhagen”. It is stated in the conference program that the aim of this event is to create a social space for stakeholders, citizens, and climate scholars—academics working on climate issues irrespective of discipline—to meet and share knowledge about the current challenges and new possibilities. The room is packed with people, and there is the buzz of excitement in the audience when the chancellor opens the conference and declares: “Together we can solve the climate crisis!” But as I sit back in my chair to listen to the succeeding keynote speakers, the obstacles mount: “Politicians have failed to tackle climate change,” “Neoliberalism has created an ideological hegemony which obstructs green transitions,” “Green markets will solve the climate crisis and universities can assist them with green technology,” and “We have to reinstate universities as the stronghold of green knowledge.” The last speaker states: “Academics simply have to communicate more!”.

The contradicting statements of different speakers have an immediate effect on the audience. The excited buzz is gone, and some people in the row behind me sigh while others shift in their chairs. The topic has changed, and the underlying question looming in the sunlit room pertains to the role and positioning of the different actors in the climate crisis, and to most speakers, the role of academia in this complex landscape. Who is really to communicate and act more?

On other more mundane days when there are no conferences to attend,

I find myself scrolling through the sites of major news outlets. “We have failed to communicate the danger of climate change, we have been too cautious,” says a prominent climate scientist. “We need to communicate more,” says another. Meanwhile the European Commission has launched their Horizon Europe project in which research funding for climate change and sustainable development are prioritized areas, and the Intergovernmental Panel on Climate Change, the IPCC, has issued a public communication handbook to encourage climate scholars to communicate with different publics (Corner et al., 2018a).

But how researchers communicate on the topic of climate change is nevertheless publicly contested, as exemplified in some headlines that criticize researchers who use open letters to communicate their concerns about climate change: “A political debate, not research” (Berlinske, 2018) states an editorial in Berlinske, a Danish newspaper. “Is it the role of researchers to be activists?” (Stranzl, 2019), a journalist writing for the Austrian *Wiener Zeitung* rhetorically asks. In this latter case, the answer is affirmative. It’s “activist research” claim climate denialist sites, discarding open letters. The question is then: how do researchers navigate this complex communication environment in which the role and place of academic actors is contested while research communication on climate change is institutionally encouraged?

This dissertation examines researchers’ reflections on and engagement with climate change communication in a complex and changing academic, social, and political landscape. In the wake of the escalating climate crisis, a polarized social debate, and a transformed academic landscape where there is room for redefined professional roles, I examine one particular form of research communication—open letters—and ask what engagement in this form reveals about issues pertaining to how climate scholars view their roles and responsibilities, how communication and information practices are enacted, and what the implications are for conceptualizations of research communication.

Open letter engagements and practices of mobilization

If you opened a European newspaper in the fall of 2018 or spring of 2019, it is possible that you encountered headlines such as: “More than 3,400 scientists press politicians on climate facts” or “Scientists write an open letter: the climate debate feeds on facts,” to name a few. Following the warmest European summer on record in 2021 (Copernicus, 2022), open letters from researchers appeared in Polish, German, and Austrian newspapers warning about climate inaction. Fast forward, and the warm winter of 2022 raised alarms of rapidly melting glaciers, prompting Italian scientists to pen open letters warning of the consequences. And in the autumn of 2022, the largest Swedish evening tabloid published a desperate outcry from 1944 Swedish researchers asking politicians what it is about climate change that they still do not understand?

In the wake of the mounting climate crisis and the dire IPCC special report of 2018, it appeared that many researchers in Europe put pen to paper, producing open letters that articulated facts about climate change



Headlines from open letters published in news media. Screenshots by the author.

and specified the importance of engaging in climate issues. These initiatives and a subsequent sustained engagement in the large-scale writing of open letters, as illustrated in the opening paragraphs, uncoordinated but taking place in several European countries, are at the center of this thesis as my study engages with researchers' public communication efforts on climate change, and more specifically, through the means of open letters. By interviewing the initiators, co-authors, and high profiled signatories of these open letters, and by analyzing the written content of the open letters, I explore the contexts and practices of open letter communication and the negotiations, tensions, and understandings the interviewed researchers attach to their engagement.

Most of the open letters in this study received considerable if only fleeting attention, not the least for their impressive signature lists that sometimes amounted to 20,000 signatures. Some letters were also written in relation to the global school strikes for climate, or drew on insights from the covid pandemic—two aspects that garnered public attention. In some countries, the open letters sparked debates pertaining not only to climate change, but also to academia: what is the role of science in society? Can or should scientists be partial and engage in political advocacy? Who has the authority to speak on climate issues? And who, out of all the scientific disciplines out there, could actually call themselves a real climate scientist? At the heart of these debates influencing commentators' topics of discussion was the form of communication the researchers had chosen to use: the open letter.

An open letter is generally defined as an opinion piece or political statement addressed to a particular person/organization but publicly displayed in an effort to raise awareness for a specific cause (Article I; Collins, 2019; Merriam Webster, 2019; Stanley, 2004). Every year, large amounts of open letters are published in mass media and on social media, and it is a communication form perceived to be increasingly used, at times even over used, in Western societies (Diamond, 2020; Geoghegan & Kelly, 2011). Different actors engage in open letters: celebrities, politicians, private citizens, organizations as well as academics. The history of open letters stretches as far back as the late 18th century and coincides with the spread and popularity of newspapers (Geoghegan & Kelly, 2011). Nevertheless,

given the existence and popularity of social media, some argue that open letters as a form of communication is superfluous since people on a daily basis express their solidarity or disagreement through “likes” and “retweet” functions (Diamond, 2020). In other words, open letters are deemed to be redundant in contemporary society because new technology offers the means for similar expression. However, this kind of techno-deterministic way of approaching communication seemingly fails to see the larger context of communication, including the perceptions, values, practices, and sociopolitical issues which shape actors’ choice of the forms of communication in which they want to engage.

Furthermore, it has been suggested that in contemporary society open letters serve as a way of expressing “half-informed opinions”, and that they gain their power not from “facts and truth”, but rather from endorsement and signatures (Rasmussen, 2021). This statement is perhaps a bit surprising, but what can be gained from this understanding is a division between fact, truth, and neutrality on the one hand, and opinions, mobilization, and politicization on the other. Such conceptual divisions are not uncommon, but scholars are increasingly arguing that we have to look beyond divisions between so called politicized/emotional opinions and objective knowledge (Davies, 2018). In fact, Davies stresses that mobilization by means of crowds and emotions has become an integral part of contemporary social life because facts can no longer (if they ever did) speak for themselves (Davies, 2018). In this outline, mobilization can be understood as ways in which information is intended to matter; it comprises practices enacted to vouch for the importance of the epistemic content of information. By extension, mobilization does not negate factual accuracy, and it co-creates the information it mobilizes at the same time. Thus, building on Davies’ idea, open letters and their use of endorsement and signatures do not make them inaccurate or untruthful; rather, they may reflect trends pertaining to the mobilization of information, which are issues I probe in this thesis through examining the practices of open letter communication.

Despite these insights, there are still prevailing ideas which see some forms of engaging with the public as politicized, whereas other forms are considered more neutral by scholars and publics alike. For instance, even

though recent studies have illustrated the strengths of different forms of social media when used in communication (Huber et al., 2019; Oeldorf-Hirsch, 2018), negative connotations linked to the emotional, political, and misinforming characteristics of social media often take precedence in social discourse (see Bradshaw & Howard, 2018; Jacques et al., 2019). Open letters, an understudied form of outreach, are similarly surrounded by negative political connotations (see Rasmussen, 2021). Furthermore, open letter communication is foremost approached as a means of transmitting a message, but communication is much more than this; it is a way of shaping and reforming. It is productive and a meaning-making activity in its own right.

In this thesis I shift perspective. Drawing on practice theory and its application in science communication and information studies, I look beyond techno-deterministic and *a priori* definitions of open letters as primarily opinion pieces transmitting a particular political message. Instead, I explore the actors, activities, artifacts, social discourse, values, and norms that make up the practice of communicating in open letters. The specific forms of communication researchers engage in cannot *a priori* be classified as primarily political. Instead, the communication form exists in a nexus of related contexts and practices, mutually shaping each other and creating a specific public engagement and the “happening” of information (Cox, 2012; Felt & Davies, 2020; Haider, 2012). In a similar vein, I view communication practices as constitutive and productive—a transformative process that adds something in its own right (Felt & Davies, 2020, pp. 28-31). Indeed, science communication can be viewed as a form of storytelling, a space where organizations, identities, and phenomena are created (Davies & Horst, 2016, pp. 59-61).

As I will explore, open letter communication does not only have the potential to shape and reshape social collectives, understandings, and practices; it may also affect the person communicating and their perception of their professional roles. Therefore, central questions of inquiry revolve around the information and communication practices that make up a particular event, and the kinds of changes, tensions, negotiations, and issues these practices and subsequent understandings of these practices make visible.

Aim and questions

The aim of this thesis is to develop a more nuanced and in-depth understanding of research communication on climate change and specifically to unpack and rethink academic engagement through open letters.

Building on the idea that communication is a constitutive practice combined with insights from practice-theory as applied in science communication studies and information studies, this thesis attempts to create an integrated view of communication whereby research communication cannot be separated from the happenings and movements occurring within the wider context of academic institutional reforms and sociopolitical discourses on climate change. The overarching inquiries and the key aspects of my investigation are:

RQ1): What does climate scholars' engagement in open letters contribute to understandings of research communication?

RQ2): In which ways do researchers intend to make information matter (mobilize information) through their open letter communication practices?

RQ3): How, and in which ways, does open letter communication come to shape, reshape and affirm researchers' professional identities?

Structure of the thesis

This thesis is constructed as a compilation thesis comprising five articles probing different aspects of scholars' engagement in open letters on climate change. In my view, the compilation thesis serves as a tool for reflection and reinterpretation. To make an analogy to Bakhtin's (1986) dialogical approach to textual genres, it is as if every article is a complete and understandable utterance in itself, adhering to prescribed norms within the specific journals in which they operate. Placed in a compilation thesis, however, the articles enter into a dialogue with each other; they require a reinterpretation since they are placed in a new context (see Bakhtin, 1986, p. 161). In a similar vein, Hagen (2011) writes that the internal logic of the compilation thesis deals with the relations between the parts and the whole, which Hagen calls an "example of emergence" (2011). In other words, the parts say something on their own, and at the same

time they create something new when put in relation to each other – something emerges.

In this thesis, the different articles raise questions that can be thematized along the lines of communication and information practices, understandings of communication and information practices, and perceptions of professional identities. The articles are formed and shaped in relation to different journals and different disciplinary canons and themes. When put together in this thesis, they not only create a synthesis of their contribution to understandings of research communication, but also pursue a new line of argument, an emergence, namely that of the mobilization of information. This new line of inquiry is primarily emphasized in RQ2. I explore how information is intended to matter through the communication practices in which researchers engage – an issue which the articles in themselves do not discuss explicitly.

The specific problems addressed in the articles are:

- How do open letters, seen as a communication form and practice, bridge and conflate notions of scholarly and science communication? (Article I)
- How does the concept of information shape researchers' communication practices in open letters, and in turn, how is information shaped by these same practices? (Article II)
- What kind of social collectives are presented and enacted in the open letters through affective practices? (Article III)
- What kind of professional identities does engagement in the open letters on climate change shape, reshape, and affirm? (Article IV)
- In which ways do researchers enact “media logic” in their open letter engagements, and why? (Article V)

All the articles relate to RQ1 since they highlight different aspects of open letters as a form of research communication. In terms of RQ2, which considers the issue of mobilization, the first, second, and third articles are those which particularly relate to the ways open letters can be seen to mobilize information, as described in the table below. The fourth and fifth articles primarily relate to RQ3, which explores professional identities:

	RQ₁	RQ₂	RQ₃
Article 1	Explores converging communication practices involved in open letter communication, expanding the notion of research communication.	Introduces matters of scale as forms of mobilization, for instance through signature lists.	
Article 2	Considers temporality as an element of practice, shaping research communication.	Describes temporal aspects of mobilization, e.g., durability.	
Article 3	Describes the affective practices of research communication and the sociality that research communication offers.	Unpacks trust-making as a form of mobilization, especially in regard to the creation of social collectives.	
Article 4	Sheds light on research communication as a constitutive practice in relation to professional identities.		Explores the professional continuities and ruptures in regard to professional reflections brought about by open letter communication.
Article 5	Explores professional relations between actors and how these relations shape understandings of research communication.		Problematizes media logic and introduces the term as an analytical device to explore professional relations between actors in open letter communication.

The inquiries of Articles I, II, and III fall within the theme of communication and information practices, and researchers' understandings of these practices. Here, I probe different practices, such as peer review practices, affective practices, temporal practices, and researchers' understandings thereof, and what these perspectives reveal about researchers' engagement in open letters. The inquiries of Articles IV and V are centered around researchers' perceptions of their professional identities *vis-à-vis* other actors. In addition, they address specific activities and strategies researchers enact in their open letter engagements.

The thesis begins with a chapter entitled *Setting the Scene*, in which I account for the relevant studies that have informed my thesis and the inquiries pursued. This is followed by a theoretical chapter outlining the conceptual approach the thesis adopts and the specific concepts which I

develop: mobilization of information through identities and social collectives, scales, and temporalities. In the fourth chapter, the methods are presented and reflected upon, and in the fifth chapter I summarize the articles. In the sixth chapter, the articles are discussed in relation to my stated research questions in three thematized sub-sections. The concluding remarks present a summary of my discussion as well as my answers to the question posed, reflections, and suggestions for future research.

Positioning

This thesis is positioned to contribute to several research areas. Following the outline of my thesis, I situate my study in the fields of environmental communication, science communication, and information studies. I see these fields and disciplines contributing in various ways to expanding the understanding of open letters on climate change and researchers' engagement in this communication form. Drawing on practice theory, the thesis examines information and communication as they unfold; information and communication are "happening", assembled and in a flux, dependent on context and the actors involved. Practice approaches are prevalent in information studies, science communication, and environmental communication, yet this thesis integrates the study of communication practices with that of information practices.

The manner in which these different disciplines approach research communication varies, which also enriches this project. Environmental communication, an area which developed in the 2000s into an established research field (Hansen, 2011), contributes with a richness of explored forms of communication in climate matters and attention to the specific communicative conditions and affordances the topic of climate change presents. Meanwhile, science communication inspires with a vast and differentiated theoretical body of work on the topic of communication, and information studies provides understandings of scholarly communication along with a rich body of work pertaining to scholarly information practices. When entwined, they create an environment within which to explore open letters from a variety of angles. By positioning this thesis at the intersection of these three research fields and disciplines, I hope to contribute

theoretically with a more nuanced understanding of research communication. Additionally, following studies of information as practice, this thesis recognizes information as an analytical unit, an element not commonly employed in science and environmental communication. In short, interdisciplinarity is used to build and expand different disciplines and research fields as well as the understanding of a specific communication engagement: open letters on climate change.

Clarification of concepts

The concepts scholarly communication, science communication, and research communication figure in the thesis and warrant a definition. The use of all these concepts largely stems from the interdisciplinary character of this thesis, which implies that concepts are defined differently in the areas in which the articles are published. When I employ science or scholarly communication, the intention is to specifically mark a discipline or a specific phenomenon as it is traditionally understood and discussed within a specific discipline. However, the main working term is research communication, which I see as an umbrella term to signal a theoretical integration of scholarly and science communication. My discussion and research of open letters on climate change suggest a conflation of communication practices, professional positioning, and understandings which are best captured by not dividing open letters into either scholarly communication or science communication. At times, I have to resort to using these concepts in the manner in which they are employed traditionally within different disciplines, but in the hope that it is clear to the reader when it happens.

Scholarly communication, as understood in information studies, generally denotes formal peer-to-peer communication (Anderson, 2018, pp.10-12; Thoren, 2006, p. 221). Science communication is a broader concept that also denotes a research field at the same time. It has been defined as: “the use of appropriate skills, media, activities, and dialogue to produce one or more of the following personal responses to science (the AEIOU vowel analogy): Awareness, Enjoyment, Interest, Opinion-forming, and Understanding” (Burns et al., 2003, p. 183). In addition, science communication is generally directed at a wide range of non-expert publics (*ibid.*)

Science communication involves not only researchers as active communicators, but also businesses, journalists, the media, and professional communicators (Burns et al., 2003, p. 184). While some definitions see science communication as incorporating an explicit purpose of communicating scientific issues to differentiated publics (see Burns et al., 2003), others also include implicit means for opening up to a wider range of actors participating in and negotiating science in the public realm, for instance parks and their landscape design, courtrooms, fiction, and technological appliances. These are spaces where science is negotiated and shaped, thereby making them into a form of science communication (Felt & Davies, 2020, pp. 3-4). Regardless of which of these definitions of science communication you employ, the common denominator is that science is either directed at differentiated non-expert publics, or takes place in the public realm through a variety of explicit and implicit processes. This stands in opposition to the definition of scholarly communication, in which peer-to-peer experts constitute the audience and the speaker.

Research communication, on the other hand, is a bit fussier and loosely defined in relation to its intended “recipients”. At times, it denotes communicating research to different publics: “Research communication is defined as the process of interpreting or translating complex research findings into a language, format, and context that non-experts can understand” (Carter & Paulis, 2010, p. 8). At other times, the term can denote communication with fellow researchers (IGI, 2022). In sum, it can be both. Additionally, different actors can engage in research communication, such as institutions, media, academics, and so forth. Moreover, it is stressed that the term research communication is more inclusive than science communication; for instance, the term science generally refers to the natural sciences, even if science communication does include other academic disciplines (Davies & Horst, 2016, pp. 4-5). In this sense, research communication has the potential to work as an umbrella term for both scholarly and science communication, although to my knowledge it is not employed as such today. In this thesis, I primarily use the term research communication with the aim of highlighting the integration of scholarly and science communication, as exemplified in the open letter initiatives.

Setting the scene: science and communication in the climate change environment

Making sense of research communication in a transformed academic landscape

During one interview session, my interlocutor and I were speaking of the how and why of open letter communication on climate change when they suddenly fell silent, producing a short pause in the middle of a sentence. “It is like,” they soon explained, seemingly trying to find the right words, “there is this conflict between communicating what science is and what science does, and what communication about science wants to do. And I find this very problematic.” I nodded, but didn’t have the presence of mind to ask a follow-up question before the researcher moved on. But this perceived tension became an issue I later returned to in my exploration of the open letters. The issues the interlocutor raised are relevant to how open letters come to be understood, framed, and conceptualized. If science is perceived as emancipatory, socially engaged, and situated, what separates open letter communication from other types of research communication? Likewise, if science is perceived as neutral, decontextual, and separated from other social activities, how does it shape perceptions of open letter communication? Indeed, public perceptions, theoretical ideas, and professional self-understandings of what constitutes science influence different forms and ways of communicating. In this section, I want to stress the transformations of the Western academic institution which have occurred over the past decades, transformations which may affect how we come to understand “science” and “communication” in the climate change context.

From an institutional and organizational perspective, the neoliberaliza-

tion of American and European academic institutions has been widely covered in research literature, which has explored the introduction of business models that turn knowledge into patented products, audit cultures, publication pressures, and the design of courses based on their commercial value (Etzkowitz et al., 1998; Noonan, 2016). Science as an institution has undergone transformations in regard to its purpose in society, as well as its funding and management (Etzkowitz et al., 1998; Feldman & Sandoval, 2018; Noonan, 2016; Radder, 2010), all factors which influence ideas of science. The notion of “entrepreneurial science” refers to the state’s need to stimulate economic growth in the absence of formal industrial policies (Etzkowitz et al., 1998, pp. 39-40), and it has been one way to describe the current developments. The university is made useful to the state in terms of innovation and economic viability (Jasanoff, 2005, p. 226), with the state and science joined in networks of mutual support (Jasanoff, 2005, p. 245). Scientific advice is integrated into governing bodies, and government officials rely on scientific sources to justify a wide range of decisions (Hilgartner, 2000). Arguably, this is not a new feature of science. Political integration in scientific issues, especially when it comes to modernization, innovation, and war-making, constitute political themes which have influenced the direction of science for decades (see Hacking, 1999). However, Jasanoff argues that the difference constitutes visibly marked state and science relations wherein scientific knowledge-making is incorporated into the practices of state-making by means of ordering knowledge, identities, institutions, discourses, and representations (Jasanoff, 2004, pp. 3-6). Some scholars describe the roles available to scientists in this landscape from a scalar point of view, starting from neutral scientists to scientists as issue advocates (Pielke Jr, 2007). Other scholars hold that scientists are increasingly engaged and immersed in social issues; essentially, there are no neutral roles to pursue (Beaulieu et al., 2018; Cann & DeMeulenaere, 2020; Laing et al., 2022).

In the wake of these changes, there have also been calls for a wider democratization of science. From an analytical standpoint, this is perhaps best described by calls for open science, post-normal science, or citizen science. Open science, a concept which arguably brings evocations of a science that is otherwise “closed”, calls for transparency and better public access to scientific data and papers (Ayrís, 2018), post normal science ques-

tions the lack of epistemic diversity (Funtowicz & Ravetz, 2003), while citizen science calls for the pluralizing of expertise and the inclusion of laypeople in the research process (Strasser et. al., 2019). Democratization efforts are not restricted to academia, and it can, for instance, be seen in national and EU-initiated projects promoting increased public communication of research results.

The framing of communication as central in the emerging academic landscape has also led to discussions about the rationales of research communication: how, when, what, to whom, and why researchers communicate have become central topics of debate. In the field of science communication, one strand of research emphasizes the emerging communication forms, models of communication, and how to engage in successful/efficient communication (Bultitude, 2011; Corner et al., 2018b; Howarth et al., 2020). Another strand describes research communication as a tool for commercial, personal, and institutional promotion that is integrated into the neoliberal institutional rationale (Duffy & Pooley, 2018; Thorpe & Gregory, 2010). Moreover, there are calls to repurpose science communication, to consider the experiential and meaning-making aspects of science communication as a diverse ecosystem in a bid to move away from discussions on effectiveness, information transfer, and deficit-dialogue debates (Davies et al., 2019; Davies & Horst, 2016). In view of these developments, environmental communication is best described as experimental and action-oriented with intentions to generate social and political impact (Balantyne, 2016; Kumpu, 2022).

In information studies, investigations of research communication generally fall into the subfield of scholarly communication. Scholarly communication denotes intra-scholar communication, which can be communication with academic peers through journals, monographs, theses, conference papers, or posters (Anderson, 2018, pp.10-12; Thoren, 2006, p. 221). Furthermore, scholarly communication is also a type of “ecosystem” which deals with the production, dissemination, analysis, and packaging of scholarly knowledge (Anderson, 2018, p. 1). With the introduction of social media, the border between what is perceived as purely scholarly communication and other types of communication has become less distinct, as target audiences and metrics by which one measures research output and

impact are blended (Cassidy et al., 2017; Kjellberg, 2010; Kjellberg & Haider, 2018). This can, for instance, be seen in the inclusion of blogs as a genre of scholarly communication (Anderson, 2018, p. 11; Kjellberg, 2010), the analysis and emphasis on academic social network sites (Andersen & Lomborg, 2020; Francke & Hammarfelt, 2022; Manca, 2018), and the use of altmetrics to measure scholarly impact (see Cassidy et al., 2017; Priem, 2013). Furthermore, there is an increased awareness of a social epistemic imbalance and injustice within the system of scholarly communication, thus prompting researchers to question the infrastructures and political and sociocultural biases related to scholarly communication (Fricker, 2007; Schmidt, 2020; Shearer et al., 2020). Moreover, the practices and behaviors of scholarly communication, sometimes defined as information work (see Palmer & Cragin, 2008), have been researched through, for instance, data-sharing practices (Borgman, 2015; Dutoit, 2022), interdisciplinary work practices (Gullbekk, 2021; Palmer & Neumann, 2002), documentary practices (Frohmann, 2001), peer-review practices (Biagioli, 2002), practices involved in scientific image-making (Kjellman, 2019), and information sharing practices (Pilerot & Limberg, 2011).

However, despite the expansion and blurring of former borders in information studies, the communication forms that are included and perceived as scholarly communication are still rather rigid. Academic interest in and understanding of scholarly communication—whether concerning form, communication infrastructure, support, or politics—is primarily based on traditional conceptualizations of peer-to-peer and a fairly standard set of communication forms employed for this purpose. Even exceptions, such as calls for bibliodiversity in scholarly communication, primarily highlight the marginalization of communication forms tied to the scholarly research process, such as data, software, reviews, policy papers, monographs, and curricula (Shearer et al., 2020, pp.10–11). At the same time, environmental communication and science communication illustrate that the range of communicative events that researchers engage in have never been more diverse and richer: storytelling, TED-talks, visualizations, science festivals, open letters, op-eds, tweets, blogs, exhibitions (Arnold, 2018; Boykoff, 2019; Davies, 2019; Sugimoto et al., 2013; Walter et al., 2019; Wibek et al., 2013) – the list goes on.

The confusion around communication and science which the interviewee expressed in the opening quote of this section is arguably symptomatic of the complexity involved when old concepts and activities intersect or clash with new and emerging ideas and engagements. Nevertheless, this does not mean that one should abandon delving deeper into its meanings. As the academic landscape changes, studies of scholars' practices and engagements in different communication forms can help to contextualize and reform existing conceptualizations. In this study, I break with popular conceptualizations of viewing open letters as political opinion pieces and call on scholars to rethink prevailing conceptual borders.

Open letters as a form of research communication

An open letter can broadly be understood as a specific form of communication, a genre, and is thereby conceptualized with specific characteristics. These characteristics coproduce knowledge, and they may form and shape both textual content and social activities surrounding the genre in particular ways (Andersen, 2008). However, genres are not immutable and solid; they change, evolve, and upon closer look, may incorporate a heterogeneous set of forms and expressions. While some scholars prefer to make genre the focal point of inquiry, I use genre as one component of many that construct a representation and informs social activities. In particular, I will illustrate how perceptions of open letters as a purely politicized genre obscure the heterogeneity of expressions and the overlaps with other communication practices, thus making them into a form of research communication. To arrive at this conclusion, this section will first provide the historical and conceptual background of open letters.

The dictionary definition of an open letter is as follows: "a published letter of protest or appeal usually addressed to an individual but intended for the general public" (Merriam Webster, 2019; Article 1). In this definition, the site of publication is not specified as a defining characteristic, whereas other definitions incorporate the publication venue. For instance, Collins Dictionary states: "an open letter is a letter that is published in a newspaper or magazine" (Collins Dictionary, 2019; Article 1).

Definitions including the publication venue may relate to the 18th century roots of open letters and the popular spread of newspapers and magazines at around the same time (Geoghegan & Kelly, 2011). One of the most famous open letters, Emile Zola's "J'accuse", was published in the newspaper *L'Aurore* in 1898 and aimed to mobilize public support for a falsely accused Jewish artillery officer in the French army (Wilkes, 1998; Article I). Zola's engagement in open letters also shed light on another characteristic of open letters—they are often written by someone of high status in a given community (Stanley, 2004, p. 207). Celebrities' engagement in writing open letters is not unusual, but open letters are also commonly employed by academics. The open letters on climate issues which comprise this study are only a few of the recent well-publicized open letters initiated by academics on a variety of topics, such as the Pisa educational evaluation system, nuclear weapons, and GMOs (see e.g., Polanyi, 2017; Smith, 2013; Valante, 2016; Article I). Open letters have also been described as a communication form that is increasingly used (although no numerical data exist to confirm this) (Diamond, 2020; Geoghegan & Kelly, 2011). Despite academics' own engagement in this communication form, very few scholars have explored it as an analytical subject. One of the few accounts which briefly analyzes open letters compares them to private letters, stating that open letters are placed in a space between public writing and private writing (Stanley, 2004, p. 207). The author also reflected on the communicative function of open letters, as they do not require or invite responses, but are pronouncements to be read (*ibid.*).

One of the contemporary features of open letters is that the format allows for a variety of publication options. Today's media landscape offers a range of opportunities in relation to publication venues, such as social media platforms, institutional home pages, and news media venues. Researchers' engagement in writing open letters thus traverses the production of a single letter and incorporates publication strategies involving external actors. This fluidity can also affect how open letters are understood. For instance, the news media is frequently mentioned and employed as a venue where open letters circulate. However, newspapers are not homogenous entities; rather, they consist of a different set of sub-genres. Op-eds constitute one of these sub-genres, a section in the newspaper where individuals, often politicians

and interest groups comprised of other professionals, express opinions with the intention of influencing public opinion (Sommer & Maycroft, 2008; Article I). Op-eds border genre descriptions of open letters in that the intent is to engage publics as well as inform public discussions.

To conclude, there are undoubtedly certain genre characteristics that shape the content of the letters in this study, such as the popularizing function and the intent to create change. Given the mobilizing political potential of open letters, one might assume that emotions might be more commonly applied to open letters because the genre allows for these forms of expression. At the same time, however, communication forms are far from static. They are elastic and shaped in different constellations; they interact with different actors, such as the communication venues described above, which may alter and change genres depending on the context. Additionally, communication is made up of an array of activities which shape and reshape perceptions of the form of communication. By making the form of communication one of many components which shape the practices of research communication, I hope to gain a more nuanced view of the open letter initiatives on climate change.

In the following sections, I outline the context of open letter communication on climate change with the aim of providing an integrated and entangled view of communication.

Communicating in the climate crisis

Environmental communication is a maturing research area that overlaps with science communication. One environmental issue often discussed is climate change. Due to the urgency and existential threat climate change poses, it has been argued that the climate crisis offers new ways to conduct, engage in, and communicate science (Davies, 2018, pp. 215-219). Furthermore, the importance of communicating about climate change to the wider public is strongly encouraged by several national and pan-European political institutions (Corner et al., 2018a). The best example is perhaps the European Environmental Agency, EEA, which gives political and institutional weight to climate communication initiatives (see EEA, 2019).

Climate communication has frequently been characterized as action-

oriented since the intention of the speakers is to make publics socially engaged in the issue (Kumpu, 2022). The open letters on climate change which I have studied fall into this category. They want to do something; they come with an intention to act. Such a characterization makes it tempting to solely focus on the techniques of communication employed to make action happen. In this section, I outline different approaches to the object of study exemplified in the literature, and illustrate the necessity of using an integrated approach to open letters that comprises both an exploration of the practices and techniques involved in communication and a detailed look at the productive and transformative aspects of communication, wherein communication is not merely a means to an end but a transformative process in itself that shapes the person(s) communicating.

How science engages with different publics incorporates a variety of approaches since science communication is informed by specific understandings of society, science, and their interrelations (Felt & Davies, 2020, p. 2). A traditional approach based on the idea of science as a single knowledge provider in society is illustrated by the deficit/diffusionist model. In this model, science communication is envisioned as a bridge between the scientific community and society, a form of translation. The implicit understanding is that science is separated from other actors in society, and communication becomes a way to bridge gaps between actors (Bucchi & Trench, 2014). Publics are perceived as passive and undifferentiated recipients of knowledge while scientists are cognitive authorities transferring knowledge (*ibid.*).

In the wake of mounting criticism towards this model, various democratization approaches to science communication have come to epitomize closer bonds with other actors in society. New forms of science communication based on engagement are seen as ways to make the boundaries between science and other parts of society increasingly indistinct and represent attempts to reverse the deficit model (Corner et al., 2018b). Examples include dialogical approaches with emphasis on multi-directional learning, citizen engagement activities, and Science in Society (SiS) engagements, which incorporate so-called extended peer communities (see Bucchi & Trench, 2014; Bultitude, 2011; Casini & Neresini, 2012; Funtowitz & Ravetz, 2003). However, criticism has emerged regarding SiS engagements

since research has shown that participants in citizen engagement activities still tend to fall back on a deficit and diffusionist model of science communication, viewing their engagements as a unidirectional knowledge transfer to a passive public (Casini & Neresini, 2012; Suldowsky, 2016). Indeed, the very notion of public engagement has been criticized for failing to specify what it entails: behavioral change and personal engagement? Or participation in democratic decision-making? Political protests or research communication? (see Kumpu, 2022).

The same vagueness of what constitutes public engagement is also seen in climate communication. There is, however, a more general tendency to depict climate communication as action-oriented, directed towards inducing some kind of change (either personal, behavioral, or structural) by engaging publics with the topic of climate change (Ballantyne, 2016; Kumpu, 2022). This understanding has consequences for climate communication. In general, the communication debate circulates around efforts to find efficient approaches of communicating: how you say something, to whom do you say it, and by what means (see e.g., Arnold, 2018; Boykoff, 2019; Corner et al., 2018b; Kahan, 2015). In the context of climate controversies, involving public and political disavowal of climate facts and the role of values, trust, emotions, identities, and framings in climate change communication have come to the forefront (Cloud, 2020; Davies, 2018; Oreskes, 2019; Oreskes & Conway, 2011). As some people reject climate science because it contradicts their own values or threaten established modes of living, the question of how to frame climate change to effectively engage audiences has become central (Corner et al., 2018b; Oreskes, 2019). To this aim, a plethora of communication forms are put to use: visuals, evocative language, storytelling, science fairs, dialogic encounters, and citizens' scientific involvement, to name a few (Arnold, 2018; Brenthel, 2017; Chertkovskaya et al., 2020; Corner et al., 2018b).

Arguably, recommendations and innovations of "how to" communicate contribute to making the communication act fundamental in efforts regarding the public acceptance of anthropogenic climate change and future climate actions: it is up to researchers to get their communication skills right. However, some researchers point out that a focus on the improvement of communication techniques overlooks the more complicated issues

involved in communication, such as the wider environment in which different publics are situated, power relations, the question of voice, and how society and environmental communication are coproduced (Joosse et al., 2020; Kumpu, 2022). For instance, longitudinal studies concerning how climate change is communicated found that climate communication is invariably framed in accordance with wider political and social events and discussions at the time (Hulme et al., 2018).

Similarly, in a bid to move away from the deficit vs. dialogue debate and the “do’s and don’ts” of science communication research, some scholars have suggested that science communication can be approached as a meaning-making activity that pays attention to lived experience, identity work, narratives, and emotion (Davies & Horst, 2016; Davies et al., 2019). Such an approach focuses the lens on what communication does in particular contexts. Similarly, Felt and Davies (2020) call for an STS approach to science communication which entails paying attention to the interconnections between science, technology, and society, which are negotiated and enacted through interactions between individuals, communities, and artifacts. The practice of communicating thus becomes a site where science and the social are enacted and reenacted, where tensions, identities, and negotiations are made visible and shaped.

My thesis is inspired by this approach although I also recognize the techniques and the efforts made to engage publics through open letters. In general, I deem these techniques interesting as an object of study as they are part of what communication and, for that matter, information does in particular contexts.

A polarised environment: climate change and the issue of (dis)trust in scientists

In the course of searching for open letters, the search engines Google and Startpage led me on many occasions to climate denialists’ sites, such as the German EIKE or the Dutch Climategate site. What these organizations have in common is the critique of science in their denial of anthropogenic climate change. This technique to cast doubt on science is not new, and it has been employed for decades for various purposes. As Oreskes and her

coauthors point out in several publications, the construction of scientific doubts on the basis of economic and political interests has been central to dividing publics on matters of climate change (Oreskes & Conway, 2010; Oreskes et al., 2018). These conditions are thus aspects which my interviewees have to take into consideration when communicating. Moreover, the issue of doubt brings trust to the foreground.

To many scholars, a certain degree of trust is viewed as a prerequisite for the acceptance of scientific claims (Engdahl & Lidskog, 2014; Huber et al., 2019; Schäfer, 2016; Shapin, 1994). Trust is seen as a substitute for control; it is characterized by asymmetry and the acceptance of dependence on other social actors and their sayings and actions (Schäfer, 2016). By extension, trust in science has been perceived as a “leap of faith” whereby the public decides to believe knowledge and claims they themselves cannot verify (Engdahl & Lidskog, 2014, p. 708). This “leap of faith” is not happening in a vacuum. Creating trust is an integral aspect of communicating, and it can be done in a variety of ways. For instance, trust-making can be seen as a form of mobilization, here defined as the intention to make information matter by various means. The premise of such a definition is that facts do not speak for themselves; they need public support (Davies, 2018). To Davies, this means that scientists need to promote knowledge by different means (p. 211). I build on this idea and suggest that this type of promotion which Davies speaks of should be seen in relation to trust-making. In this thesis, different forms of trust-making through open letter communication are explored through the conceptual notion of mobilization, which I discuss in depth in the conceptual section of the thesis. In this section, I sketch the academic, political, and social environments of climate change in which trust-making activities take place, are shaped and negotiated.

Trust in science communication has been explored in a variety of ways, for example, in relation to institutional activities, boundary work, epistemic authority, open science, media, platforms, identities as well as ethics (Bradshaw & Howard 2018; Corner et al., 2018b; Gieryn, 1995; Grand et al., 2012; Hardos, 2018; Huber et al., 2019; Irwin & Horst, 2016; John, 2018; Schäfer, 2016; Shapin, 1994; Wilsdon & Willis, 2004). The majority of these accounts stress the importance of exploring trust as contextual, relational, and fluctuating. This is relevant since actions to undermine trust

in science are integrated into larger social and political issues. As the political landscape changes in the West, scholars are faced with populism, the decline of scientific authority, and distrust in experts and politicians (Davies, 2018; Marres, 2018; Oreskes, 2019). These conditions affect climate scholars in particular since the topic of climate change adds to the complexity by introducing political polarization, targeted disinformation campaigns, and disagreements about the course of action (Oreskes & Conway, 2011; Serrao-Neumann et al., 2018). Recent literature exploring public perceptions of science in the West (US, Europe) suggests that there is declining trust in science and scientists. In what has been called an assault on experts, populist politics and right-wing politicians are blamed for discarding experts as irrelevant if facts and information are contrary to popular belief or pragmatic political goals (Smulewicz-Zucker, 2018; Thompson, 2018). Although trust levels are higher in some countries, such as Sweden (VA, 2020), they do not escape the general Western tendency of increased polarization (SR, 2020).

In a reflective piece on the role of trust in science, Schäfer stresses that “trust in science is, to a considerable extent, the outcome of mediated communication. Most people do not have direct contact with scientists or scientific organizations, and do not regularly visit public lectures, science fairs, or science cafés” (Schäfer, 2016, p.1). This reflection sheds light on how various actors co-create trust in science. One of these actors, the media—comprising the daily press, TV, and radio—has long been the prime communicator of environmental information, but it has faced criticism levelled at their construction of science news (Schäfer, 2016; Whibey & Ward, 2016). In relation to climate change, the media is said to have propelled the view that there are two equal sides debating the existence of climate change by giving airtime to opposing views. The news media’s preference for covering conflict and drama has contributed to skewed reporting on climate change issues (Whibey & Ward, 2016). Media conglomerates have not been insensitive to this critique. In 2018-2019, the BBC and The Guardian both announced directives on how to report on climate change, including language use and sensitivity in relation to whom one interviews (Carrington, 2019; Hickman, 2018). However, as I later illustrate in Article V, understandings of the role of media institutions and

their practices are still factors climate scholars take into consideration when communicating.

Academic climate communication is thus interlinked with the interests of other actors, such as through institutions, political discourses, or targeted climate denial campaigns, and this is a factor which cannot be seen in isolation from research communication on climate issues and which to a considerable degree is implicated in the creation of (dis)trust.

In sum, how to convey trust in research communication on climate change is a factor researchers face on an everyday basis, and this can be linked to broader structural changes and to the specific conditions of human-made climate change as a social and political topic. Open letters, written with the intention of inducing change, provide a framework for exploring how different forms of mobilization may be enacted in a particular setting and in research communication practices.

Scientific identities: towards engaged climate scholarship?

When asked about how initiators of open letters viewed their engagement, some interlocutors brought forward the issue of activism:

But like, yeah, our letter, it is communication because we wanted to communicate, but for us, it was also an obvious form of activism, like, what can we do as scientists? Well, we can actually write, right? Or give lectures. That is what we can do as people working in the university.

This quote sheds light on the boundaries of professional activities. It raises questions pertaining to what one can do as a scientist and how researchers understand their roles. Additionally, the question highlights the constitutive aspects of communication: identity and self-reflections are part of the communicative actions we undertake, and they form and shape us in different ways. In this section, I present previous studies about professional norms and values influencing professional identities in academia, with a particular focus on emergent professional roles in the climate context.

The issue of identity is not a new phenomena, nor is it related to climate

change specifically. Scientific professional identities have long been discussed in relation to disciplines, publics, media, and institutional norms (see Cloud, 2020; Gieryn, 1995; Knorr-Cetina, 1999; Merton, 1973). Indeed, disciplines, universities, research networks, and labs in the context of identity work to present a differentiated and complex picture in which researchers have multiple allegiances, roles, and identities (Davies & Horst, 2016, pp. 71–74). However, a common representation of the role of science and scientists that frequently figures in scientific and public discussions constitutes the value-free objective scientist (Cloud, 2020; Wolfe, 2018). This influential institutional norm—the value-neutral, objective scientist who adheres to specific value systems that are separated from society—can be traced to Merton’s representations of science (Merton, 1973). In *The Normative Structure of Science*, Merton (1973) outlines what he perceives to be the ethos of science, communalism, universalism, disinterestedness, and organized skepticism. These norms are expressed in prescriptions, preferences, and permissions, and internalized by the people working at the institution (1973, p. 265). Merton thus puts emphasis on the scientific institution, and action and identification are explained by the adherence to collective norms and values held by members of the specific group. Merton’s representation—the notion of pure and objective science—has been criticized for being stripped of history. Science is reinforced as something outside society; it is independent from social and historical contexts, as well as individual experiences such as emotions, which alienate science and scientific knowledge from its social context (Croissant & Restivo, 1995, 57–63).

Mertonian representations are by no means the only ideals of science and scientists that have influenced scientific identities and roles. As a counterview, Marxist perspectives on science have emphasized social immersion and change-oriented research, which is an institutional stance more common in the social sciences (Cann & DeMeulenaere, 2020; Laing et al., 2022). Marx famously saw science as a cultural activity intertwined in political and social life. More importantly, science, Marx argued, served the elites and could thus not be neutral (Schmalzer, 2008). He distinguished between bourgeois science and human science, with the latter being the goal of science: to be socially integrated and globally work for the masses (see Croissant & Restivo, 1995).

There have also been efforts to merge ideals of science as socially integrated with objectivism, such as through the notion of perspectivism, which holds that objective and transformative knowledge can be produced through the incorporation of different standpoints (Longino, 1990; Oreskes, 2019). Within this framework, scientists are encouraged not to shun away from declaring their values or social relations since they exist, and being transparent with such issues can also provide a basis for building trust. To Oreskes, the inevitable social and political character of science does not have to stand in opposition to the establishment of evidence and consensual knowledge-making (Oreskes, 2019).

In regard to climate change as a topic, the existential threat it poses to humans and non-humans have caused scholars, in the natural and social sciences alike, to reflect on their roles as academics and scientists. This is echoed in the concept of deep adaptation, which denotes how living in the climate crisis requires new forms of meaningful action that reduces future and current harm (Bendell, 2020). In the past decade, the notion of engaged scholarship has emerged as researchers attempt to grapple with issues related to the university's mission, climate change, and the researchers' position in society (Beaulieu et al., 2018). Central concepts of engaged scholarship are social justice and citizenship. Social justice means working towards the realization of specific social goals and thereby providing a balance between scholarly achievement and the public good. The citizenship aspect relates to the ways in which one integrates their role as expert with their role as citizen (Beaulieu et al., 2018). These aspects have been discussed in relation to activism and activist science, where researchers actively seek to change the social issues they research (Frey et al., 2006; Laing et al., 2022).

A point of contention in research on activism in general is what counts as activism, and how to define academic activism. Broadly speaking, academic activism is defined by a desire to conduct socially impactful research, a pedagogical commitment to social change, and a sensitivity to institutional inequalities. Academic activism is said to balance cultural critique and political action (Weathrall, 2022, p. 6), and ethics is stressed as a defining character of academic activism (Nørgård & Bengtsen, 2021). Within these frameworks, a common denominator is the attempt to challenge unequal

internal institutional structures as well as the structures of oppression outside the institution. However, the word activism is also said to be misleading since it silences everyday types of engagements which can be seen as activism, so-called “quiet” or “minor activism” such as teaching, workshops, or policy consultations on particular subjects (Laing et al., 2022).

Activism and engaged science share certain characteristics as well as illustrate differences in how to approach and think of politics. Activism is more explicitly political, and it is embraced and actively pursued (Castro Leal et al., 2021). While literature discussing engaged science sees external ongoing transformations as prompting scholars to adapt and support such structures (see Beaulieu et al., 2018), literature on activism takes a more active stand to push for change and become an active agent of transformation (see Weathrall, 2022). Therefore, it can be argued that the issue of professional identity also becomes more pronounced. Regardless of the conceptual differences between academic activism and engaged science, they both promote social inclusivity; when viewing them in tandem, engaged science and academic activism both advocate a socially immersed type of science and scholarship.

In sum, viewing communication as a constitutive practice means that the activities researchers engage in may chafe against or conform to professional norms. These vary over time and are culturally conditioned and bounded by political systems. As such, depending on where scientists position themselves, open letters on climate change can be viewed not only as “artifacts of social practices exemplifying what a socially immersed science can look like” (Article III, p. 353), but also as engagements which take place within existing institutional norms (Article IV). In the discussion, I explore the constitutive aspects of communication in relation to perceptions of professional identities.

Conceptual framework

Constructivist perspectives on communication and information: an overarching approach

This thesis adopts an overarching ontological approach to research communication as processual, relational, constructed, constitutive, assembled, and in flux. This ontological approach can be traced to several different theoretical strands. In particular, I have drawn inspiration from Felt and Davies' "STS-approach to communication" (Felt & Davies, 2020). To Felt and Davies, the main point of this approach to communication is the move away from representational aspects to performance and coproduction; in other words, communication should be seen as contextual and constitutive, a process that adds something in its own right. As such, the practices of communication, what gets assembled and how, and what is realized and co-constructed in terms of values, identities, institutions, understandings, publics, spaces, time, affect, and narratives, constitute the core of their STS-approach to communication (2020, pp. 39-61). In this setting, identities as a feature of coproduction is one important aspect; not only can communication be seen to shape and remake identities (Felt & Davies, 2020, p.16), but identities can also stabilize knowledge and have the power to affect the actions people take in the world (Jasanoff, 2004, p. 39). Science communication is important to researchers for several reasons, not least because it provides a means of presenting, disassociating, or attaching the self to particular institutions, groups or values (Davies and Horst, 2016, pp.70-71).

This ontological view treats communication as a "knowing space" in its own right, fundamentally linked to the transformative potentials of communication (Felt & Davies, 2020, pp. 19-20), and it rests on a construc-

tivist point of departure which diverges from approaches treating communication as a means of transporting a message or scientific knowledge-making as an exclusive and objective form of knowledge. Likewise, I view open letter communication as a constitutive practice; it is a process, and it makes and remakes things, actors, and ideas. This thesis embraces the happenings of communication and the dynamic nature of communication, which also includes the happening and dynamics of information.

Indeed, information in this thesis is approached from the ontological standpoint of social constructivism, where information cannot be seen in isolation from its social and material relations (Cox, 2012). The understanding of information is often explored from the perspective of information in practice, where information is something that “happens” as opposed to simply “being” (Haider, 2012, p. 652). Social and material aspects are coproducers of information, which means that information is relational and changing (Cox, 2012; Haider, 2012; Lloyd, 2009; Rivano-Eckerdal, 2012; Veinot, 2007). This is not to say that information as content is insignificant; instead, it can be approached as an element of practice. In a study of search in everyday life, Haider and Sundin (2019) illustrate how the use of online search engines is a part of social practices embedded in the everyday and given meaning in situated contexts, and at the same time a way of finding information wherein content and its “aboutness” affect how we understand and engage in the world. Similarly, this thesis addresses the communication of climate change—an existential threat and subject with an extensive social life outside academia—which influences and is influenced by research communication on the matter. Thus, the epistemic content of information and its aboutness—in this case comprising the effects of climate change and ideas for mitigation, calls for action in climate matters, ideas about the role of science in this context, political inaction, and polarized social debates on the matter—are implicated in both the communication practices and information practices. Content is thus both static—it is about a specific topic—and dynamic: it changes, it happens, and it gains meaning this way.

In many ways, these two overarching understandings of communication and information overlap and sometimes conflate. Indeed, the interchangeability and integration between communication and information as united

entities go against calls for separating the two (see e.g., Koopman, 2019). Research communication can be seen as an information practice, integrated into the different social and material aspects which make information happen. When to refer to communication and when to refer to information is thus to some extent defined by disciplinary traditions and by established concepts and fields of research; furthermore, they encourage the use of and view of specific notions. It is thus fair to say that the employment of either communication or information is situated in specific contexts. Moreover, the notions have colloquial meanings and were understood differently by my interlocutors, which also complicates the understanding of the terms in this thesis. Broadly speaking, in colloquial terms, communication is often referring to a process, while information is viewed as the content of communication. Thus, while I want the reader to appreciate the overlaps and at times conflation of the notions of information and communication, I also readily admit that the employment of them sometimes diverge, especially in descriptions of the interlocutors' view of information. The colloquial meanings of the two notions are very different from how they are theorized in studies of information as practice and in STS-views of communication, and it feeds back into how my interlocutors view their engagement in open letters and the resulting practices they employ in the creation of the letters and their intended public life. My thesis invariably needs to deal with this confusion, and in the articles, I turn the divergences between colloquial understandings and theoretical understandings into a productive force.

In the following sections, I present the conceptual framework that guided and inspired my studies.

Practice perspectives on communication and information

To shed light on the constitutive aspects of research communication, I approach it from the perspective of practice theory as it is broadly understood. The centrality of practices constitutes one strong theoretical strand within a range of disciplines in the social sciences and humanities (e.g., Bourdieu, 1977; Reckwitz, 2002), often referred to as the practice turn (Schatzki, 2001). Practices make, establish, and construct particular reali-

ties (Felt and Davies, 2020, p. 30). Practices have also constituted an analytical lens with which to probe various aspects of academic life, perhaps most famously in Latour and Woolgar's *Laboratory Life* where scientists' everyday work practices in relation to their knowledge constructions were examined (Latour & Woolgar, 1979). Within information studies, research on academic practices comprise data sharing practices, documentary practices, information sharing practices, and peer-review practices (Biagioli, 2002; Borgman, 2015; Dutoit, 2022; Frohmann, 2001; Gullbekk, 2021; Palmer & Neumann, 2002; Pilerot & Limberg, 2011), to name a few.

Somewhat simplified, in the terminology of practice theory, practices can be understood as routinized ways of engaging in the world, and they are made up of elements consisting of material and immaterial aspects such as emotions, objects, activities, discourse, institutions, and so forth (Schatzki, 2001). Different elements come together in various contexts and make up a practice (*ibid.*). Pentzold describes a practice as a "coextensive articulation of patterns of action and patterns of meanings" (Pentzold, 2020, p. 2967). In such an understanding, practices constitute the realm of the social; it is where the social happens (Pentzold, 2020, p. 2966). In other words, practices are both shaped by and shape the social and material world. In this setting, dualisms between micro-macro or between human and non-human are dissolved since these dimensions are articulated in practice (Schatzki, 2001). In cultural studies of communication, praxeological traditions do not employ practices as analytical sites in themselves, but rather are employed to highlight other aspects of social life (Pentzold, 2020, p. 2968). When practices constitute the analytical lens, the actors are less pronounced since they make up the practice. Moreover, the idea of practices being routinized ways of doings and sayings does not mean they are irreversibly conditioned and static. Shove and coauthors stress that the contexts in which practices take place allow for change, improvisation, and reshuffling (Shove et al., 2012).

The notion of information practices, as it has been developed in information studies, is informed by practice theories. And just like practice theories, information practices include various articulations of the notion information practices. Some denominators common between the different articulations of information practices are socio-material aspects as copro-

ducers of information. Information happens in the interconnections between objects, humans, understandings, and activities, which make up elements that form information practices (Cox, 2012; Gullbekk, 2021; Haider, 2012; Lloyd, 2009; Savolainen, 2007; Veinot, 2007). In Pilerot and coauthors' exploration of the use of practice theory in information studies, the different studies analyzed employ different key tenets such as embodiment and materiality, linguistic discourse, rules and norms, sets of activities, and so forth (Pilerot et al., 2017). This also means that studies informed by practice theory can be relatively elastic; they adopt a basic sensibility derived from practice theory, but they adapt and transform according to the purpose and focus of the study. Likewise, in *Exploring Science Communication*, Felt and Davies (2020) discuss practices as a point of departure rather than a strict theoretical framework (pp. 28-31). For these authors, a practice approach offers ways to explore "the diverse realities they (practices) conjure into being" (p. 30), and they stress how practices provide a view of the processuality, flows, and entanglement between different social fields which make up an event, in this case science communication (pp. 28-29).

Positioning practice as the unit of analysis in research communication and in studies of information can thus mean different things depending on how the investigation is carried out, but the general consensus is that different fields, objects, and actors come together and become observable in a practice. I argue that an approach informed by practice theory, broadly understood, may provide a more fine-grained analysis of the constitutive aspects of communication; that is, it offers ways to explore the entanglements of organizational and discursive fields (academic institutions, climate change communication, the environment, and media for example), values, activities, and emotions as they come together and are arranged in specific recognizable ways. In my studies, I take my departure in practices, but like in the previously mentioned studies, the approach is adapted to the purpose of the papers and the research question addressed.

Although analyses of practices do not necessitate empirical observation, many studies focus on what is taking place in situ in a closed setting (Pentzold, 2020). However, practices can also exist across time and space; for instance, digital technologies link space and different time zones. Prac-

tices can furthermore be explored in language through the words people use to describe their activities (Schatzki, 2012). Moreover, practices can also be observed in text, and they can constitute means for both historical and contemporary analysis (Scheer, 2012; Szymanski, 2020). In this thesis, I view interviews and texts as sites where practices can be explored. In the interviews, my interlocutors speak of the activities they engage in and how these are ordered. I follow their own descriptions and understandings of the activities in which they engage. To analyze the open letters, I engage in a particular form of textual analysis focused on affective practices, which is described in the next section.

A practice approach: theoretical summary of the articles

In *Conflating scholarly and science communication practices: the production of open letters* (Article I), I investigate research communication practices as understood in the production and making of the open letters on climate change (Article I). Based on my interlocutors' descriptions, I conceptualize three practices the initiators of the letters engaged in. The practices are peer review, community building, and merit-making. While the first practice, peer review, is well known, the other two require explanation. Community-building practices refer to the authorship of scientific material and the publication of the collectively made artifact, and they serve as a meeting space for researchers, thus producing and enacting a form of scientific communality (Berggren, 2016; Hilgartner, 2000; Merton, 1973; Ziman, 2000). Merit-making practices refer to communication as a strategy for promotion and branding, as well as a productivity indicator which counts towards professional promotion (Duffy & Pooley, 2017; Etzkowits et al., 1998; Feldman & Sandoval, 2018; Noonan, 2016). In the article, I illustrate how these practices are coproduced, transformed, and shaped in the different settings in which climate scholars are situated, most prominently in relation to academic norms and policies, the wider social and political discourse surrounding climate change, as well as the media environment and the communication form—open letters—which the researchers chose to use. The key tenets of practice in this article are thus primarily sets of activities, linguistic discourse, a specific genre, and norms and policies.

In *Fast-food information, information quality and information gap: a temporal exploration of the notion of “information” in science communication on climate change* (Article II), I explore how temporality in practices is more than the chronological organization of activities; rather, it informs understandings of information and communication among my interlocutors. The paper primarily discusses concepts and their becoming, but it is through the lens of time and its related communication practices that information comes into being among my interlocutors. Temporality as an element of practice thus constitutes an entry point for exploring how the notion of information is understood by my interviewees. By focusing on temporality, I illustrate the entanglements existing between conceptualizations of information and different forms of communication, their materiality, affordances, and related norms and praxis. All these elements, when assembled, give rise to different notions of information among my interlocutors. This includes, for instance, fast food information and information quality, two concepts of information intrinsically linked to communication practices. Therefore, I stress the interconnection between information and communication, and I suggest that these various notions of information can be seen as expressions of how and why one communicates.

In *Research communication on climate change through open letters: uniting cognition, affect and action by affective alignments* (Article III), I explore affective practices in text (Article III) and investigate the aligning potentials of affect. This conceptual and methodological tool builds on Wetherell (2015) and Scheer's (2012) conceptualizations of affective practices. Whereas Wetherell primarily focuses on in-situ, observable practices, Scheer (2012) focuses on practices in texts: affective practices can be traced in texts and do not necessarily need to be observed as they unfold. Thus, communication involves specific affective practices which can align or distance actors from each other. Scheer labels one strand of affective textual practices as mobilizing, by which she means practices aimed at enlisting and producing certain emotions. For instance, political activism can be seen to rely on affective practices aimed at enlisting and producing certain affective states such as debating, demonstrating, and chanting, to name a few (2012, p. 212). In my employment of affective practice, I pay particular attention to the forms of affective practices Scheer calls “mobilizing”. I

specifically focus on endorsing, by which initiators enlist support from other actors, as manifested in signature lists and, when they exist, the opening paragraphs in newspapers where some letters were published. Endorsing can be viewed as an affective practice aimed at evoking emotions among both practitioners and readers. At the same time, it can align actors as well as separate them from each other. The key tenets of practice in this article are thus affective practices, and in the article, I focus specifically on the affective practice of endorsing.

In *Open letters and climate communication: the professional roles and identities of researchers in times of crisis* (Article IV), I primarily explore the researchers' understandings of the open letter communication they engage in, and how this constitutive practice may contribute to their sense of professional identity. I focus on specific phenomena, expectations, and doings that my interlocutors link to open letters, such as institutions, scientific norms, writing activities, and the perceived audience. In this article, practices of relevance in relation to open letters primarily surface as configuring a knowing space where professional identities are translated, reconsidered and understood. The practices in themselves are not analyzed—it is what they give rise to and transform which constitutes my analytical focus. In this article, I primarily highlight the constitutive aspects of communication; that is, what practices of communication engender in terms of identities.

Finally, in *Publishing strategies and professional demarcations: enacting media logic in academic climate communication through open letters* (Article V), I explore the researchers' publication strategies and their employment of the concept of media logic, a concept to which they attribute specific practices and values emerging from the news media environment. It is by exploring a specific concept (media logic) that specific activities are made visible. As in Article IV, communication practices serve as points of reflection, illustrating the entanglements between different institutional and social fields. In this article, practices do not only contribute to the publication of the letter as an end-product, a scholarly artifact; rather, they engender and delineate specific professional identities and are also shaped by those identities.

Mobilization as a conceptual tool: identities, collectives, time and scales

Following the nature of the compilation thesis as an example of emergence (Hagen, 2011), a way to synthesize and piece together something new, I have drawn on and developed the concept of mobilization to understand and explain communication practices related to open letters and the shaping of information, two issues which my different articles, when joined together, come to speak of.

The word mobilization can indeed be used colloquially in descriptions of open letters as political opinion pieces. Within my framework, however, mobilization has a wider definition and can broadly be understood as a trust-making activity infused with the promotion and certification of information by various means. This means that it is not a specific politicized feature of communicating, but rather an integral part of communicating irrespective of genre. In other words, mobilization is an intent to make information matter. In my use of the word, it encompasses ways of making the epistemic content of information trustworthy, approachable, and visible. By following a practice approach to information, the epistemic content and its “aboutness” (incorporating the polarized climate debate and the related activities it influences) are entangled in communicative practices by various means in open letters. Mobilization comprises ways in which practices are employed in a futuristic sense; mobilization is an intention related to how information is supposed to unfold and happen in the public sphere. At the same time, it is a practice which may or may not take into account the situatedness of the perceived audience.

In my development of the notion of mobilization, I have taken inspiration from organizational studies and studies in political communication. In both these fields, the terms knowledge mobilization and popular mobilization figure as concepts aimed at describing specific features of communication. In organization studies, knowledge mobilization is employed to refer to “the proactive process that involves efforts to transform practice through the circulation of knowledge within and across practice domains” (Swan et al., 2016, p. 2). Specifically, this has meant a view of knowledge as something you have and which can be circulated, but recent studies in

the field have pushed knowledge mobilization towards an understanding of knowledge as the translation and interpretation of mundane activities (Nicolini et al., 2023). This framework shares affinities with the trajectory of information behavior research, which has gone from treating information as content towards viewing it as emergent through practices (Nicolini et al., 2023).

In addition, I am informed by Davies's (2018) suggestion that mobilization has come to constitute not only an indispensable feature of political life, but also increasingly, of science. In fact, Davies argues that scientists cannot communicate as if facts speak for themselves; they need public support. To the author, this means that scientists need to promote knowledge by different means and not only rely on representations of objectivity (Davies, 2018, p. 211). In *Nervous States: how feelings took over the world*, Davies (2018) elaborates on mobilization as a democratic feature not only reserved for demagogues; it particularly stresses the need for experts to embrace crowds and emotions in order to harness public support for a cause or knowledge, including science and scientific knowledge. Davies illustrates how scientists explore means of mobilization, such as through the March for Science—a gathering held in Washington DC in 2017 to defend the role of science and facts for society. This event could be seen as a congregation of physical bodies to promote knowledge authority (p. 23) and, by extension, a specific type of knowledge. Davies' framework is not fully developed into a concept since the author makes use of the notions mobilization, crowd politics, age of crowds, and popular mobilization to illustrate something new: a trend, a phenomena of communicating, and a way of being in contemporary democracies (pp. 6-12, 23-28, 215-224). Additionally, to Davies, mobilization is invariably seen as promotion, which differs from how mobilization is understood in organizational studies. In terms of how information is treated, Davies frequently juxtaposes so-called objective claims of the past with the emotional and mobilizing claims of the present (e.g., pp. xiv, 24-27), all while also suggesting that emotions and facts can and must go hand in hand (pp. 28, 208-210, 215-224).

However, whether the mobilization of information is a new development is perhaps up for debate. Already in the 1970s, Merton stressed the importance of "the daily demonstration of science", for instance, through

the use of mundane technological appliances, to mobilize public acceptance of the “authority of science” and its knowledge/information (Merton, 1973, p. 161). Within Merton’s framework, it is the more low-key aspects of mobilization which are highlighted, as opposed to Davies’ more attention-grabbing notions such as street manifestations and emotional language (Davies, 2018). Thus, these authors shed light on different ways of circulating information, promoting knowledge, and establishing the associated authority. What they have in common is that mobilization is directed towards an external recipient. But this does not always have to be the case. In fact, it is argued that mobilization takes place on a regular basis in scholarly communication through peer review (Pamuk, 2022). Practices that account for the validity of information can be viewed as a form of mobilization, here directed towards an internal recipient; it is an intent to make information matter.

Viewing mobilization as a feature which transcends both the public and the scientific peer realm instead of just treating it as a public phenomenon evokes parallels to Hilgartner’s view of the popularization of scientific information as a matter which exists in both intra-scientific and public documents (Hilgartner, 1990). Although Hilgartner might have downplayed disciplinary differences as well as the issue of language, the general point conveyed is the interdependency between the social and scientific realm as opposed to views stressing their separation. Indeed, considering mobilization as an issue that transcends public and academic texts and spheres can help shed light on the multiple means applied to account for the validity of, and trust in, information as well as the attempts to make information matter. Thus, I would like to stress that mobilization is not something I view as specific to open letters; indeed, it is a feature of communication and information irrespective of genre. Nevertheless, mobilization might be articulated differently in different contexts of information. As such, information as epistemic content is not static, existing in isolation from the communication practices involved. Mobilization comprises a temporal, future-oriented dimension, an intention and desire to enable particular understandings and actions in which information unfolds.

In this thesis, I explore various means of mobilization as they appeared in open letter communication. In particular, I view collectives and identi-

ties, temporalities, and scales as practices of mobilization. These aspects all derive from the ways in which the interlocutors in my study engaged in open letter communication, and my interpretation of those as practices through my specific theoretical lens. The mobilization of information is thus realized in the researchers' communication and information practices, which the articles comprising this thesis have explored in different ways, but with other intents and aspects in focus.

Trust-making: social collectives and identities as means of mobilization

When Greta Thunberg addressed world leaders at the World Economic Forum in 2019, she stressed a collective “we” who were sensing and fearing climate change, and she invited the world leaders to join them (see Article III). What I want to highlight is her use of a social collective when delivering a speech about climate change. It is a “we” who is acting, sensing, and understanding climate matters, which can be viewed as a way to make her speech trustworthy; she is part of a larger collective which experiences the same issues she does.

Creating trust in information as epistemic content is arguably an integral aspect of communicating. This can also be seen as a low-key measure of mobilization. Following erosions of trust in authorities, including science, the question of how to build trust has become a matter of political and scholarly debate (Oreskes, 2019; Smulewicz-Zucker, 2018; Thompson, 2018). Trust can be seen as an elementary precondition for information; it makes information come alive, come to matter. Thus, one way to think about trust is to view it as a feature of mobilization. In this section, I discuss trust-making as exemplified in the making of identities and collectives as a means to mobilize information in particular ways.

As a starting point, I take inspiration from Shapin's (1994) account of trust and scientific claims in 17th- and 18th-century Britain. Shapin suggested that trust in scientific information was, and still is, created through social identities. In Shapin's example, 17th- and 18th-century British scientists employed certain codes of trust, in particular that of the behavior of the gentleman, to vouch for the truthfulness of their discoveries (1994).

While Shapin primarily stressed individual identity as central to the establishment of trust in scientific knowledge, a more contemporary argument highlights the social aspects of identity, what Davies' calls the "politics of crowds" (2018, pp. 23, 28). Davies primarily focuses on the depth of common feelings which makes certain social issues visible, but there are also reasons to view social effervescence and conviviality embodied in crowds as potent aspects of mobilization. Communities formed around an issue arguably constitute ways of making the topic trustworthy; it is certified around the social conviviality of groups of people.

The establishment of collectives is particularly interesting in climate matters since climate change is seen to be riddled by social ruptures that make social cohesion an issue to strive for (Song, 2022). In Davies' framework, public support for the notion that science and in particular scientific facts hold a particularly important position in society is mobilized by means of what he calls "crowd politics" (p. 6-12, 23, 28). As such, social identity and conviviality—that is, the massive alignment of different social groups around an issue—establish the knowledge as valid and truthful. In a similar vein, Moser (2022) stresses the need for the strengthening of social communities to further climate issues. The difference between Moser and Davies lies in their view of what social collectives are intended to accomplish. Davies sees their strengths as a means of mobilizing content and the authority and support of the speaker, while Moser sees the creation of solidarity and communities as more of an indirect way of furthering climate action and trust in climate information. To Moser, "communicative work might be considered a form of public love." It must consistently foster a sense of solidarity so that community members feel they are going through the challenge together and they are strengthened and restored rather than diminished by it" (2022, p. 284).

Thus, these authors offer perspectives on collectives and identities and their roles in mobilizing climate issues, albeit in different ways. Additionally, it is primarily the real-time relationships that are examined. But social collectives can also be established discursively in texts and through practices. Indeed, social creations of "us" and "them" are frequently made in texts, for instance by linking groups together with different affective states (Ahmed, 2004). Although these types of discursive collectives are analyzed

as representations of a specific problem, they may also affect the collectives concerned in ways which may lead to tangible, real time effects (see Ahmed, 2004; Cloud, 2020). By extension, these types of discursive collectives can be seen as ways intended to evoke trust in information—it is an attempt to make information as epistemic content matter for specific discursively formed groups.

In my discussion of the open letters, I draw on and develop ways of viewing the articulation and construction of identities and social collectives as practices of mobilization. In particular, I suggest that mobilization can be both low-key and attention-grabbing. Therefore, I reject ideas of mobilization as merely a loud or particular political feature of communicating. Instead, mobilization is integrated into the act of communicating climate issues in various ways.

Temporality and the mobilization of information

Temporality is a notion which often surfaces in discussions on climate change. In many ways, the climate crisis is defined by a particular timescale, best described as urgency, which is also the temporal condition under which the open letters are written. Moreover, the speed and rhythm of time, the future projections, and the long timescales involved in climate matters are implicated in how we come to understand and experience the climate crisis (Adam, 1993; Rosa, 2013). Likewise, timescales are often implicated in perceptions of the communication medium. Communication on social media is, for instance, often described as a fast-paced, accelerated form of communication (Davies, 2018, p. 6). In terms of how we speak and understand information, time also constitutes an omnipresent aspect while not being explicitly theorized (Haider et al., 2022). As an example, Haider and coauthors (2022) illustrate how the conceptualization of “information-as-a-thing” reveals an underlying perspective of time linked to permanence and durability without being explicitly emphasized and theorized. Other temporal aspects related to information are newness and freshness, which are seen as intrinsic to the concept (Day, 2001; Peters, 1988), as well as schisms referring to the asynchronous aspects of information when some people are perceived as having information and others not (Matsuno, 1998).

However, little has been said about timescales and mobilization. As stated above, urgency—a temporal aspect—constitutes an imperative to engage in open letter communication in the first place. But this is not the only way in which temporality is implicated in open letter communication. In this thesis, I'd like to make a case for temporality as entangled in the mobilization of information in different ways. In other words, how researchers understand information and temporality is intimately linked to how they choose to communicate an issue and vice versa. Different aspects of mobilization can be linked to temporality, such as trust-making, certification, and promotion. Mobilization of information through the lens of temporality can be seen in attempts to employ short time spans in order to elevate a specific point in time to maximize visibility. Alternatively, aiming for longevity and durability through one's communication choices may also present ways of mobilizing information. Some communication practices may be considered more durable, especially in relation to ideas of the communication medium one chooses. This temporal aspect constitutes a form of trust-making, a way to make information matter through time. The examples mentioned are by no means an exhaustive list of the ways temporal aspects may mobilize information; indeed, the above examples simply illustrate ways by which this problem can be understood. In the discussion I explore the timescales employed and created in open letter communication.

Scales and scalability as means of mobilization

One of the more attention-grabbing types of mobilization is the amassment of a large number of bodies and voices (Davies, 2018). What can be gathered from this type of mobilization is scalability; by increasing the number of people who say the same thing, certain knowledge and agendas are elevated and expanded. In this particular case, scalability can be seen as a specific feature of communication and its related practices, which is also what I discuss in this section.

Scalability and “scaling up” have been described as part of a modernist project, and they constitute a particular way of approaching economic development (Pfotenhauer, 2022; Tsing, 2012). In contemporary society,

scalability is perhaps best captured in political and economic life at large (Pfotenhauer et al., 2022). In their article *The politics of Scaling*, Pfotenhauer and coauthors argue that “scalability-thinking” has come to permeate public policy; a politics of scale is visible in policy documents concerning areas of future innovation geared towards scaling up (2022). In science, there is a similar development as policy frameworks and rationales for research projects are being scaled (Tsing, 2012).

Scalability constitutes the relationship between the large and the small, and often involves the small being scaled up to a large setting without changing the nature of the project, knowledge, or thing that is being scaled (Tsing, 2012). The scaling and the imperative to scale information, things, and projects has been questioned, perhaps most famously by Tsing (2012), who argues for nonscalability. The danger of scales, according to Tsing, is their inability to take relationships and localities into consideration. It is foremost about expanding and resisting every attempt to change (ibid.). In Tsing’s words, “Scalability projects banish meaningful diversity, which is to say, diversity that might change things” (2012, p.507). As an example, Tsing directs attention to disastrous scaled projects such as colonial plantations where non-native plants came to substitute the wiped out or decimated native plants, not to speak of the human misery implicated in this project (Tsing, 2012).

In relation to climate change, scales are frequently employed in representations of climate issues (Christensen et al., 2013; Pasek, 2019). There is a tendency to present climate change on a global or relatively large scale at the expense of small, place-based understandings of climate change (Pasek, 2019; Tsing, 2015). These types of scaled representations might hamper audiences to fully comprehend the issue, as they are far removed from the local environment (Pasek, 2019). Moreover, global scaling requires considerable imaginative work as it is based on abstractions; there is a need to transcend the particular and see compatibilities over differences (Tsing, 2015, pp. 211-212). Others stress how portrayals of climate change are characterized by scalar transcendence, in which local and global framings of climate change converge in coverages and narratives of specific issues (Christensen et al., 2013, p. 10). Scalar transcendences, also labelled trans-scalar, multi-scalar, or inter-scalar activities, are issues which eco-crit-

ics stress as important for understanding the environmental and social changes taking place (Bartha, 2021; Clark & Szerszynski, 2021; Goodbody, 2021). Indeed, environmental issues have been characterized as phenomena of scalar complexity involving multiple and various spaces, times, and actors (Dürbeck & Hüpkes, 2021). Nonetheless, political institutions such as the European Commission steer climate mitigation efforts through policies that are expected to be applicable on grand societal scales (Pfothenauer et al., 2022). In such outlines, climate change appears as a monochrome problem requiring identical mitigation efforts worldwide.

Taking inspiration from Tsing, Pfothenauer, and subsequent discussions of scales and framing in climate representations and policy documents, I suggest that scaling can be seen as a practice of research communication and a way to mobilize information. Scaling up constitutes a particular form of promoting information, elevating it and expanding it. The underlying rationale of scaling information can be linked to a desire to invoke change by spreading a message to as many people as possible by means that create as much visibility as possible. A message is scaled to appear in a diversity of contexts without considering localities and situated realities. The understanding of information in this type of mobilizing practice is primarily instrumental; it is viewed as immutable and easily scalable. As such, it echoes long-standing and much criticized diffusionist traditions that view communication as a means of transporting a message (see Bucchi & Trench, 2014, for an in-depth discussion). However, scaling information as a mobilizing practice is at the same time a bit different because mobilization also incorporates a futuristic vision of how information is supposed to unfold in the public sphere; the utter size and massive scale is intended to make an impression and force understanding and action. The scale of the message is regarded as a prerequisite for making information trustworthy and thereby prompt action; it is an intent to make information matter.

In the discussion chapter, I analyze different forms of scalar practices employed in the open letters and consider their potentials and setbacks, but first I will present and discuss my methods.

Methods

“Mystery as method”: embracing the messiness of the research process

I want to start this chapter by presenting the overall methodological approach which informed my study, an approach intent on embracing the messiness and mysteries of research. This project has been a process of reformulations, of going back and forth, and of changing directions. The organic process, in which the researcher changes directions and reformulates ideas of the study and the central focus of the project, can be likened to what Alvesson and Kärreman (2007) call a methodological “pursuit of mysteries and breakdowns”. Fundamentally, it places the contradictions, unsolved questions, and mysteries at the center of the research, thus guiding the inquiry from start to finish. This may indeed feel intuitive, a taken-for-granted research process we follow whether it’s openly acknowledged or not—after all, the purpose of research is invariably to understand stated problems/mysteries. However, scholarly writing often follows a specific script wherein the “messiness” of the scientific research process is hidden when presented to fellow scholars, whether in articles or conference papers (Knorr-Cetina, 1999; Latour & Woolgar, 1979). By providing a vocabulary to describe this organic process, it can, however, also be made visible; it offers a way to understand the organic research process as it unfolds. For this thesis, I employed three notions developed to pursue and embrace the messiness of research: assumptions, breakdowns, and mysteries (Alvesson & Kärreman, 2007). An assumption refers to the researcher’s own assumptions and to the assumptions in the research field of a particular issue; a breakdown challenges the assumptions, and it is a finding that turns everything on its head, redirecting the researcher to pursue other

paths or explain the breakdown. Finally, a mystery refers to an issue which is not easily explained by the background literature, an issue which prompts the researcher to implore the field anew, reformulate questions, rethink, and pursue the inquiry in new ways (see Alvesson & Kärreman, 2007).

In the context of this project, I never meant to focus solely on open letters, and the process during which I reformulated the focus of my project can be described by breakdowns and the mystery-approach. Originally, the project proposal was constructed as an investigation of different types of collaborative research communication efforts on climate change. I was interested in how different actors and contexts shape climate change information and communicative imperatives. In this outline, open letters were only one of many types of collaborative research communication activities I wanted to investigate. But after exploring some open letters and interviewing their initiators, I discovered issues that intrigued me and ultimately made me focus on them. More specifically, my assumptions, and the fields' assumptions, were challenged; they evolved into a breakdown, and finally, a mystery, something I wanted to pursue. The assumption I held was that open letters were first and foremost a political tool. This assumption was also shared in the scarce literature on open letters (see Diamond, 2020; Geoghegan & Kelly, 2011; Stanley, 2004). The breakdown was related to the processes of producing the open letters, as they comprised specific practices generally seen as scholarly practices (intra-academic communication), such as peer review, the establishment of scholarly networks through research articles (Frohmann, 2001), and increasingly, the engagement in communication for the purpose of career advancement (Hammarfelt et al., 2016; Kjellberg & Haider, 2018). These practices are seen as constitutive of scholarly communication. However, when analyzing the initiators' descriptions of the activities they engaged in while constructing the open letters and their motives for doing so, all the practices mentioned above were present, and the political aspect generally attributed to the genre of open letters was less pronounced than I had assumed among the interlocutors. It then became hard to sustain a strict division between what is scholarly communication and what is public communication. It became, in Alvesson's and Kärreman's (2007) words, a mystery, in the sense that it prompted me to rethink open letters,

which I then sought to explain by taking inspiration from STS approaches to research communication.

In the articles, I have strived to pursue “mysteries”, perhaps best described by the tensions and contradictions found in the material. For instance, why did researchers stress their powerlessness and lack of voice, when the prevailing perceptions of academics usually place them as elites in society? How come the researchers acknowledged the situated context of communication—how materials and technologies may affect the message—while at the same time adopting a decontextualized approach to communication where the main objective was just to fill an information gap? And how did the researchers use open letters when the literature has illustrated that social media essentially offers features similar to open letters? The articles comprising this thesis are the outcome of the “mysteries” I pursued, and also, fundamentally, what interested me and appealed to me.

Creating and selecting material: letters, interviews, and seminar notes

Letter selection, 2019 and 2022

I gathered my material by engaging in two rounds of letter selection. The first round started off as a snowball approach and evolved into a systematic selection using web-based search engines. In the beginning of my doctoral project, I attended a conference on climate change communication in Copenhagen, and one of the speakers mentioned an open letter they had authored in their efforts to communicate climate change publicly. I became interested in open letters, and colleagues alerted me to the existence of a few more open letters. The organic collection later evolved into a systematic search for open letters using the commercial search engine Google and the anonymous interface Startpage. Given the letters’ public character, I wanted to use a search tool available to the intended audience of the letters. Google is described as an omnipresence in everyday life, a taken-for-granted search tool engrained in our lives (Andersson, 2022). Therefore, using Google to search for letters suited my aim to be as close as possible to the intended audience of the letters. However, I also wanted

to check for potential algorithmic biases, which is why the interface Startpage was used; it delivers hits from Google but does not track users' searches, nor does it allow for targeted advertisements (Startpage, 2021). Using two different companies allowed me to screen for potential differences in the hit list.

The following search words were used in different languages: academics, scientists, open letter, and climate change. English was used first, followed by Swedish and then other Germanic and Romance languages since I am more familiar with these languages (but by no means proficient). In addition, I was introduced to a Polish letter which is part of my study. In the first round of selection, I collected nine letters published between 2018 and 2019, with the number of signatories ranging from 98 to 20,000. The letters were produced in 11 different countries: Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Poland, Sweden, Switzerland, and the UK (Andersen et al., 2018; Anonymous, 2018; Buizza, 2019; Green et al., 2018; Hedberg et al., 2019; Kubkowski et al., 2019; Rotmans et al., 2019; Scientists for climate, 2019; Scientists4future, 2019). In the second round of material collection, which took place in January and February of 2022, I gathered 8 more letters. I aimed to delve deeper into the genre of open letters and how researchers experienced and understood their professional role in the wake of the climate crisis. During this round, only Google and Startpage were used. For the purpose of consistency, I limited the search to the previous languages—English, Danish, Swedish, Polish, Italian, French, German, and Dutch. Since the previous collection covered letters between 2018 and 2019, I also narrowed the search to only include hits for letters published from 2020 to 2022. During the searches, I manually scanned the hits and collected the letters that at first glance seemed to respond to the following criteria:

- The letters had to be written by academics (and not by celebrities or NGOs for example) since the focus of the study is researchers' public communication efforts,.
- I limited the geographical location to Europe for comparative purposes. Although European university institutions respond to their country-specific regulations and conditions, the framework of the European Union and its specific goals for science communication and infor-

mation dissemination provides common ground for comparison. Additionally, the EU's policy goals for mitigating climate change also constitute common factors to which researchers situated in Europe respond (see EEA, 2019).¹

- The letters had to address the issue of anthropogenic climate change and convey information about climate change. Letters that conveyed misinformation about climate change as part of denialist campaigns or letters that only expressed support for the school strikes and specifically addressed the democratic right to protest were thus omitted.

In the first round of collection, I gathered thirteen letters in total, but nine remained after I had read the letters in full since I judged that four did not correspond to the criteria listed above. I removed a Finnish letter (English translation) that addressed the climate school strikes, a British and a Swedish letter which similarly addressed the democratic rights to strike for climate issues, and an Italian letter which denied anthropogenic climate change. The letter collection took place between March and September, 2019, in different rounds. In the second round of collection, twelve letters initially seemed to fit the criteria outlined, but after a closer reading eight remained. Four were excluded since they were either 1) published by non-governmental organizations, 2) closely linked to specific businesses, and 3) the original letter and the supposed scientists who authored it could not be found/identified and only existed as a notice in a newspaper.

Whereas the earlier letters were written addressing climate change from a more general point of view, more than half of the letters collected in 2022 addressed specific problems related to climate change, such as melting glaciers, the dangers of biomass fuel in relation to carbon neutrality, and the problem with expanded development of coal mines. In addition, three letters were not written in a specific national context, but rather addressed to the European Commission and/or directed to parties at the Glasgow Cop26. After some deliberation, I decided to include the three latter letters even though these types of letters were not found in the 2019 round of material collection. Apart from the three abovementioned letters, the remaining letters came from Austria, Italy, Poland, and Germany, and together they comprise my collected material.

I processed the letters in their original languages or, where possible,

consulted the English version (the Belgian and German/Austrian/Swiss letters were also published in English). The Dutch, French, Swedish, British, and Danish letters were read in their original language, in the Dutch case with the help of a dictionary. Expert help was enlisted for the languages I am not very well versed in, namely Italian and Polish. I first provided my own translation with the help of online dictionaries which was later revised and corrected by experts.

As for genre specifics and the fluidity of genres, the open letters collected on climate change were all referred to as open letters by the initiators and by the search engines. However, only 7 of the collected 17 letters were formally addressed to a specific recipient. In two cases, the initiators also referred to their open letter interchangeably as a press letter, indicating an ambiguity and fluidity of definition.

The open letters appeared in print news media, on community or institutional homepages, and on social media sites, sometimes on several of these venues. The letters are stylistically diverse; some resemble point-based information sheets, while others were in the form of a newspaper article or an op-ed. Some make use of narratives and a more personal language. Linguistically expressed emotions were present in many accounts (but not all), irrespective of style. The initiators expressed that they wrote the letters in ways they thought would make the most impact on the intended reader. When asked, the intended readers were politicians and citizens, and impact was often presented as behavioral change or a wide dissemination of the letter.

Overall, the letters convey information on climate change and/or specific climate issues. They also criticize the failures of politicians and, to a certain extent, citizens to act on this information. In a sense, the letters evoke an information paradox—they want to solve a problem of information with more information. Indirect references employed to vouch for the accuracy of the content include IPCC and “science” in the abstract sense of the word. Additionally, the letters come with signatures, which can also be seen as an indirect way to vouch for the accuracy of the letters. The signatories are often mentioned with their academic title and/or institutional affiliation and area of expertise.

Several issues stand out as limiting the research. Firstly, linguistic abili-

ties restricted the search: I did not try to search in languages of which I had no rudimentary knowledge, meaning that I couldn't get by with the help of previous linguistic studies and a dictionary. The representativeness of the selected letters are thus limited, but the very existence of a variety of letters from different European countries at this time is indicative of increasing academic engagement in climate issues as a social matter on a wider continental level. Secondly, inbuilt algorithmic preferences are likely to have shaped the search in ways I would not be able to control for. For instance, it is likely that only the most widely circulated open letters—letters that were published and mentioned in major news outlets and had already reached some public recognition—were visible in the search engines and therefore collected. This is at least true for Google. As for Startpage, the company states that their non-commercial interests do not allow them to use targeted advertising or track users' searches, which may indicate that algorithms designed to display the most shared/searched letters were not at work (Startpage, 2021). At the same time, Startpage delivers hits from Google, which seems to indicate that algorithmic preferences in Google inevitably influence their results. I did not notice any significant differences between the search engines in terms of hits. In some cases, one or two letters found on Google did not appear in Startpage at all.

To counter these algorithmic biases, the organic approach to letter selection, including both systematic searches and snowball encounters, arguably becomes a strength. Algorithmic preferences can be adjusted by incorporating open letters to which I was introduced. For instance, the Polish letter, to whose existence I was alerted, was not found with the selected search words in the search engines. It was only when I typed the name of the letter in full that the search engines could find it. In many ways, the snowball approach and the systematic approach to letter selection balance each other out—the snowball “encounters” present limitations in regard to the representativeness of the sample and the lack of selection, while the systematic search counters this tendency. And where the systematic search presents linguistic and algorithmic limitations, the snowball approach in some ways helps to balance these biases.

Interviews, 2019 and 2022

I have chosen to use the term interlocutor to refer to the researchers interviewed. “Interlocutor” possesses a quality which calls attention to the presence of the interviewer as a co-constructor of knowledge. The choice to use the word interlocutor is meant to highlight my presence and collaboration in knowledge-making—I am not extracting information; I am co-creating it.

After selecting the letters, I proceeded to identify the initiators and authors of the letters and send them interview requests by email. A description of the project, of myself and my position, my intentions with the project, as well as my ethical considerations, was attached in the emails (see Appendix 1). The researchers were furthermore informed that they could opt out of the project at anytime, and their data would then be deleted. For the first round of interviews, I received thirteen positive responses to the requests, but it should be noted that they only represent two thirds of the open letters. The authors of the French, Dutch, and German/Swiss/Austrian open letters did not respond to interview requests, and are therefore not represented in the interview material. When I present these three open letters in my study, they only feature in their written capacity (Article III).

Before the scheduled interview, I sent them the interview guide comprising my topical areas of interests and related questions (see Appendix 3). The interlocutors were informed that the interviews were semi-structured, which means that I intended to ask follow-up questions or delve deeper into aspects that may arise during the course of the interview. In the first round of interviews, I conducted thirteen semi-structured interviews in person or by phone/Zoom. In the second round of interviews, I interviewed six initiators covering six of the eight letters. The length of the interviews varied between 40 minutes and 70 minutes, with a mean time of 50 minutes. Eighteen of these interviews were held in English, and one in Swedish. Sixteen of the interlocutors identified themselves as initiators, one as a coauthor, and two as strong supporters and signatories of the initiatives. The interlocutors came from the natural sciences, the humanities, and the social sciences. Twelve of the interlocutors were male and seven

female. Their academic positions varied from vice-chancellor, professor, and associated professor to post doc. They all had, in one way or another, communicated publicly on the topic of climate change previously, but for the majority, open letters constituted a new form of engagement. The interviews were semi-structured and followed the same outline of questions. However, for the second round of interviews, sub-questions were added on the topic of why the initiators engaged in this specific form of communication, and I also probed deeper into the topic of professional identity.

In addition, the study includes an interview with an initiator of a “failed” open letter. The word “failed” refers to the fact that it was planned for publication in the Swedish news media, but it was rejected and never got published since the initiators gave up trying. I was introduced to this “failed” initiative by one of the interlocutors, so I contacted one of the initiators for an interview. The interlocutor was male, which makes the total number of interviewed males thirteen. Like its nineteen counterparts, the failed open letter conforms to the selection criteria, and it is only in relation to the last step, “publication”, that it is different. Nevertheless, the “failed” letter contributes with an interesting angle, and it can help to further elucidate the processes and understandings of open letters, and ultimately the research communication undertaken in this form. Furthermore, the failed letter is also interesting from the methodological perspective of a breakdown (see Alvesson & Kärreman, 2007), as something that was intended but never materialized in its full form. As such, it presents a rupture which may challenge held assumptions regarding the process of making a letter.

In summary, I conducted a total of 20 expert interviews representing authors of 12 open letters (13 male and 7 female). The majority of the interlocutors came from the natural sciences (14), while three came from the humanities and three from the social sciences. At the time of interviewing, their professional positions varied between post-doc (6), associate professor/senior researcher (6), professor (6), and vice-chancellor (2). The interlocutors consented to the interviews being recorded. I transcribed each interview in full, including repetitions, grammatical errors, pauses, and so forth. Once the interview existed as text, the original audio file was deleted to preserve the anonymity of the interlocutor. The transcribed text files

were given numerical names, and the real names of the interlocutors were omitted to avoid identification. After these steps, I proceeded to analyze the material. Since there was a small number of initiators of open letters, and since my selection was limited to academic letters, Europe, and the topical concern of climate change, it naturally follows that there was a limited number of people that could potentially be interviewed. Adding in the relative difficulty of reaching experts, the number of people interviewed was small. Additionally, since the interviews were held in either English or Swedish, linguistic concerns may have made some initiators reluctant to participate or hampered their attempt to express themselves fully in a second language. Therefore, the conclusions of this thesis should be seen as a first step to gaining an understanding of researchers' engagement in open letters as a form of research communication.

Another issue concerns the people who actually did answer. What kind of people are more likely to participate in these kind of studies? Despite previous experience communicating on climate issues publicly, for most of the researchers, it was the first time they initiated an open letter. This might have affected their willingness to be interviewed as well as their subsequent reflections and answers.

Other material: notes

During the course of this project, I initiated a research seminar on climate engagement and science communication, during which three initiators of one open letter presented their views and ideas of science communication in this form. Notes from this research seminar were added to the research material, and they comprise two pages.

Moreover, in my transcriptions from the interviews, I also made note of and paid attention to the emotional reactions of the interlocutors. I interpreted these emotions from the tone of the voice, gestures and facial expressions (when face-to-face). As such, the interview was approached as an observable event, an issue I explain further in the next section.

Conducting and analyzing interviews

The purpose and use of reflexivity

The interview situation is often described as a complex social event in which the interviewee and interviewer are cocreators of knowledge. The interview event thus encourages reflexivity and interpretation of how and to what extent the interview material can be employed (Alvesson, 2003; Alvesson & Kärreman, 2007; Alvesson & Sköldbberg, 2017). Additionally, reflexivity is described as the recognition of the researcher as a tool, and since this tool is often invisible in the external review sessions, reflexivity aims to recognize this tool and make it visible (Alvesson & Sköldbberg, 2017). However, by viewing interviews as a social event, the gaze cannot be solely focused on the researcher conducting the interview; instead, reflexive focus should also be directed towards the interactions and positioning of all the participants (*ibid.*).

In the following sections, I reflect on several issues in relation to the interviews: professional identities, hierarchy, positioning, affect and emotional reactions, linguistics as well as the interview situation as a form of “intending” in the world. The purpose of stating these issues is not only to make my own participation in the project an object of interpretation, but also to exemplify patterns of interpretation in relation to the knowledge I have constructed in this thesis. In addition, I want to illustrate how the “interview-situation” also endowed me with possibilities of observing the interaction as an event, paying attention to emotional reactions to my questions and the general sense of frustration the researchers expressed regarding the topic of climate communication.

Interviewing experts: Professional identity, hierarchy, and positioning

The interviews conducted can largely be defined as expert interviews due to the unique position of the interlocutors as initiators of a specific event and thereby experts in this event, which is the writing of open letters. The “expert” position also comes from their position in academia as experts on

the subject of climate change issues, about which they communicate. In Interviewing experts, Meuser and Nagel (2009) define an expert as a person who “possesses an institutionalized authority to construct reality” (p.19). This also means that the categories of “elites” and “experts” at times conflate; experts and elites speak from a particular influential vantage point, and they can be, or are, able to structure the conditions of action for other actors (2009). Furthermore, experts have acquired knowledge of a particular problem through an activity aimed at understanding, analyzing, and/or solving a problem (Bogner et. al., 2009).

The expert point of view is said to be intrinsically intertwined with a specific position in a hierarchy, and Bogner and coauthors stress that this is also an issue the researcher should prepare for and consider prior to interviews (Bogner et al., 2009). Arguably, such preparations will also inevitably produce/reproduce a situation in which hierarchy is important. As Gabriel points out, as interviewers, we inevitably adopt a specific attitude vis-à-vis the interviewee which influences the interview situation (Gabriel, 2019). Thus, hierarchy is not necessarily intrinsic to an interview situation, but rather something we can affect.

I tried to mentally steer away from adopting a marginal position vis-à-vis the experts interviewed since I was afraid it would affect my ability to ask more critical questions. At the same time, as a PhD student in an academic setting, professional hierarchy is omnipresent in my everyday life. This was also reinforced in the interview context on two occasions when the interlocutors tested my knowledge of climate change mitigation efforts, European climate policies, and the exact content of the latest IPCC report. During these unexpected “exams” I was rather uncomfortable, but in retrospect, I find the situation interesting for analytical purposes. There are several ways to interpret the situation. Drawing on Geertz’s description of how he finally gained acceptance in the community studied (Geertz, 1973), the “exam” could be interpreted as a test of acceptance. Is this person trustworthy? Can I accept her as my interviewer?

Another issue is related to power structures and academic hierarchy. I conducted the interviews within the same professional system in which I work, which is university institutions. This means that hierarchical positions are *de facto* present, irrespective of the interlocutors’ expert position.

As a PhD student, I have not yet formally become a researcher, and the people I interview are all senior academics and thus hierarchically above me. However, in the interview situation, these hierarchical structures are slightly modified; the interviewer is in a position to steer the conversation by asking specific questions, and although the purpose of the interview has been declared beforehand, there is still an element of uncertainty regarding how the interviewer will use the interview material. After all, interesting issues appear during interviews that were not foreseen and which may steer the research in a new direction. An “exam” such as that described above can be a way to negotiate a perceived power imbalance between interviewer and interviewee. There are other possible interpretations as well. Alvesson and Kärnman (2007) call attention to discursive circulations in interviews, and in my case, the exam situation could be seen as a form of discursive and patterned type of behavior tied to one’s professional role as a researcher and lecturer. It is simply natural to teach and to evaluate a student’s knowledge. Whichever the interpretation of the situation, it had tangible effects on the interview. These interviews were characterized by a general sense of “being steered” (from my perspective). Nonetheless, by embracing the “lecturing” approach in my material collection on these two occasions, I might also have come close to an everyday approach of how the interlocutors saw themselves acting in the world and during their everyday professional activities. Moreover, the lecturing approach gave me the freedom to ask “stupid” questions since the interlocutor embraced the identities of instructor and teacher. The value of daring to ask stupid questions sometimes lies in the surprising or complex answers that may elucidate issues that are commonly taken for granted (Welsch & Viviano, 2014). An example of a “stupid” question asked in this situation was, “Who is a climate scholar”; that is, which disciplines did the interlocutor see as engaged in climate change issues? The answers on this occasion were narrowly framed to meteorology, oceanology, and atmospheric chemistry, consequently not covering disciplines in the social and political sciences, or humanities. Such answers can elucidate research clusters and divisions within the larger climate communication initiatives. The type of knowledge this encounter produces can clarify concepts, situations, and the interlocutors’ view of their professional identity.

However, the majority of interviews were undertaken in a dialogical style that more resembled a conversation. From the perspective of “an expert interview”, Bogner and co-authors (2009) refer to this condition as a case where the interviewer is treated as a colleague and a store of common knowledge is assumed to exist between the interlocutors. In these conversations, the initiators often asked if I could direct my research in ways they considered useful to them; for example, many were interested in assessing the actual impact of the open letters. Others were interested in knowing the best way of communicating.

Finally, when the subject of the interview is sensitive, an interviewer might consider stating one’s individual positioning on the issue (Bogner et al., 2009). Since the context of public climate change communication is politically charged, I wanted my interlocutors to know that I was: 1) No climate denier, and 2) Supportive of engagement in climate communication. By stating my position, I hoped to put my interlocutors at ease. Any questions that might be interpreted as critical would perhaps not be treated defensively by default, which the politicized communication environment may have taught researchers to do.

Interviewing as intending in the world

How we speak and what questions we choose to ask inevitably shape the interview situation in various ways (Alvesson, 2003). In regard to my interviews, there was one question in particular which produced a variety of emotional reactions among my interlocutors. Initially viewing open letters as a political form of research communication, one of my questions concerned the initiators’ perceptions of open letters, whether engagement in open letters differed from other communication forms and if so, in which ways. Early on in the interviewing process, after one interlocutor spoke of open letters as activism, I began to ask other initiators if they considered open letters a form of activism. Invariably this question produced affective responses of various kinds, such as discomfort, enthusiasm, or surprise. The last category, that of “surprise”, made me reflect on how I potentially reformed and reformulated activities researchers engaged in, and made the interlocutors think about their actions in ways unfamiliar to them. In some

sense, it was not only my research that was formed and created; my questions also had the potential to affect the activities and understandings of my interlocutors.

In regard to the last point, it is possible to see interviewing as intending in the world. I want to both draw attention to the notion of transformative and emancipatory science, and to views of methods as engaging and changing the social world. The former views rest on ideas of science as a situated, subjective activity, running counter to positivist views of science as detached and descriptive (Croissant & Restivo, 1995). These views of science do not necessarily address the empirical engagement as transformative; it is primarily the motive of the research and the topic chosen that aim towards change and transformation. Nevertheless, I find the transformative aspects “good to think with” in regard to the interviews. The transformative aspects of methods have also been addressed in methodological accounts relating to practice theory, assemblage, and other related conceptual sociomaterial approaches. Lury and Wakeford (2012) call attention to the so-called inventiveness of methods; methods are not only used to understand a problem, but they also change the problem when being employed (pp. 7–11). In short, during the process of studying a particular communication form and its related particular communication practices, I may also shape practices, and perhaps unintentionally change them by the method employed to understand them.

Analyzing and processing the material: interviews and letters

Thematic analysis

A thematic approach was used to analyze the material, both the collected open letters and the interviews. The establishment of thematic categories is a foundation for any type of material analysis; without themes researchers will have nothing on which to build their studies (Ryan & Bernard, 2003). Thus, to say that one uses a thematic approach may in a sense state the obvious. However, as Ryan and Bernard (2003) point out, it is far from evident what actually constitutes a theme, and there are many concepts

and words that are often conflated with a theme—concepts, units, and expressions, to name a few. The authors see themes as flexible; they can either be broad and sweeping, tying together different expressions, or clearly demarcated and narrow (Ryan & Bernard, 2003). Furthermore, themes appear both from the inductive process of analyzing the collected material and from prior theoretical understandings and experiences. This means that we can look not only for specific types of themes, but also “discover” them in the material. Ryan and Bernard (2003) mean that most types of thematic analysis include a bit of both. This is also the case for this study; by employing a practice theory approach, I initially looked for practices researchers engaged in when communicating. At the same time, I used an inductive approach, identifying themes emerging in the material of which I had no prior experience or theoretical understanding, such as emotions and affect, actor alignments, temporality, and the notions of media logic and fast-food information.

The letters were first analyzed using a handwritten thematic content analysis (Guest et al., 2012) and by arranging the different themes emerging from the letters into clusters. These themes later came to form the different focus areas of the thesis. Some themes are significant for several focus areas while others are particular for the specific article in question.

I identified a theme in different ways: through repetitions, indigenous typologies, metaphors, word lists, actor lists, and attention to the interlocutors’ emotional emphasis. Repetitions are one of the most common ways to define a theme, and this typically involves the repetitions of a topic occurring throughout the material (Ryan & Bernard, 2003). Indigenous typologies refer to the occurrence of unfamiliar expressions and specific ways of framing a topic or problem. This can also be linked to the occurrence of metaphors (*ibid.*). In my material, “fast-food information” can be seen as an example of both an indigenous typology and a metaphor. Word lists usually refer to the identification of a word in the text and counting how many times it occurs (Ryan & Bernard, 2003). What I mean by word lists is slightly different. I wasn’t interested in how many times a specific word occurred; instead the focus was on listing words that can be grouped into a category. For instance, I used the overarching theme of emotion, and then searched the material for mentioned emotions. Likewise, I was interested

in what types of actors were present in the material and thus made lists of actors. As for the last category, emotional emphasis, I found inspiration in Gabriel's (1991) suggestion that my interlocutors' emotional reactions during the fieldwork/interviews can be seen as potential findings. Throughout the interviews, the initiators expressed a sense of frustration, which was tied to many different issues, including the academic system, political inaction, media, social media, and climate deniers, to name a few. This emotional reaction comprising different fields also came to constitute a theme.

The major themes that emerged from the analysis are the following: climate inaction/political (in)action, affect/emotions, signatures/signature lists, actor constellations/science-society relations, information gap/information quality/fast-food information, medium of communication (e.g., news media, social media), cognitive authority in relation to climate change, the role of science, activism/science communication, peer review, and the academic reward system. Thus, thematic analysis constituted a basic device that laid the groundwork for all the articles and the thesis as a whole.

Additionally, I employed different in-depth methods for the various articles, or what Ryan and Bernard (2003) call metacoding. Metacoding is a way of examining relationships between different expressions in already established themes, a type of detailed analysis of the different parts constituting the theme (*ibid.*). For instance, in Article III on affect and actor alignments, the initially established overarching theme was affect. But when I probed the expressions in the material, it emerged that this theme was also linked to actor alignments. In the second stage of analysis, I made a list of actors mentioned in relation to an affective state and continued by analyzing the actors' positioning in the text in relation to the narrative we. This method was inspired by Ahmed's methodological process of looking at linguistic mentions of a specific affect in relation to actors and objects in the text (see Ahmed, 2004). To give another example, in Article I on conflating scholarly communication practices, repetitions of events, and actions constituted the first step of the thematic analysis. As a second step metacoding was used. I examined the relationships between different events and actions, and tried to discern what constituted the event and/or action. Specifically speaking, this meant exploring the different components of an event, such as peer review, and so forth.

In summary, thematic analysis was conducted in two steps. First, I categorized major themes, and later, as I worked on the different articles, I conducted a second analysis of the themes chosen for each article.

Interview stories as an analytical device

Thematic analysis constituted the first analytical sorting device, but other means were also employed to analyze the material. Indeed, the interview situation can be likened to a form of storytelling in which the interlocutors and the interviewer tell stories about themselves (Gabriel, 1991; Sharman & Howarth, 2017). The analytical components of “storytelling” comprise events and their succession and placement in the narrative, plot twists, and emotions expressed in the interview context. The premise of storytelling is that it functions as a meaning-making device wherein interlocutors in the interview reflect on their identity and positioning in the world (Gabriel, 1991; Moezzi et al., 2017; Sharman & Howarth, 2017). Following Gabriel’s view of interviews as stories and narratives, I want to emphasize one type of narrative related to the subjective positioning of the researchers. Regardless of whether a researcher held a high academic position or was an experienced public speaker with established media networks, the majority presented and positioned themselves as powerless and frustrated actors. This identity construction was persistent, and it probed me to ask: Why was I told this? And what kind of power relations entered this story? What is important in this situation, as Gabriel (1991) points out, is to use this story to understand the interlocutors’ positioning, which may reveal deeper-seated meanings. Powerlessness is a state of being which signals a position in the world. But which world, and to whom was this powerlessness addressed? In other words, they were powerless vis-à-vis whom? Powerlessness and frustration became the “story” I chose to pursue as a sub-theme for the fourth and fifth article.

Research ethics

In accordance with Swedish regulations concerning research ethics, the study involved adults who all consented to participating in the study in their professional roles (SFS, 2003:460). There are several ethical challenges to take into consideration when conducting interviews (Allmark et al., 2009). Allmark and coauthors specifically list confidentiality, informed consent, harm, power issues, and dual roles as crucial ethical issues worth considering (*ibid.*). In regard to the first two issues—confidentiality and informed consent—I provided the participants with information beforehand about my project, intentions, and affiliations, and ensured confidentially, as described in more detail in the interview section. Furthermore, I encouraged the participants to ask questions if anything was unclear and/or if they needed more information. I did not provide interlocutors with consent forms to sign. Simply by assenting to the interview, they also assented to the conditions and ethical considerations described to them in the document sent beforehand. They were informed that they could opt out of the project at any time before its completion.

The open letters are public and intended for public view, and when the texts are referred to and quoted, I state the source and the letter. When the interviews are referred to, the matter is different. Adhering to pseudonymity, the identifying markers in the interviews are excluded, such as names of universities, country, fellow researchers, and so forth.

Allmark and coauthors' (2009) treatment of power issues primarily concerns instances when the interviewer is in a senior and more powerful position vis-à-vis the interview participants. That is, the interlocutors might have felt obliged to participate. In my case, power issues were to a certain extent reversed. This also ties into the issue of dual roles, which Allmark and coauthors (2009) stress as an ethical challenge; I am both a PhD candidate and an interviewer while my interlocutors are my professional seniors as well as interviewees.

Climate change as a topic raises ethical issues related to risk, time, and space (Dietz et al., 2007). Additionally, open letters and the political characteristics of the letters may present challenges since the political systems we inhabit and create are ever shifting and changing (Piccio & Mattoni,

2020). One potential problematic aspect from an ethical perspective regards the public nature of the open letters and how participants' pseudonymity can be protected through time and the changing circumstances related to the topics in which they engage. For instance, although the content of the letters are not sensitive topics, they are for the most part indirectly directed at governments. In addition, during the course of the project, there were instances when different national policies changed. One of the letters explicitly supported Extinction Rebellion, which is a global environmental movement using civil disobedience to compel governments to take action in climate matters. However, during the course of my project, the British government considered treating Extinction Rebellion an "organized crime group" (McDonald, 2020), and it was labelled an ideological extremist organization by the British counter-terrorism police (Dodd & Grierson, 2020). Additionally, the Polish political environment had started to become increasingly less democratic, a process which continued throughout the project (RSF, 2021). Although it is impossible to foresee any consequences, the increasingly restrictive tendencies seen throughout Europe may turn open letters into sensitive forms of communication, thereby potentially posing risks to initiators that engage in these forms of communication.

Summary of the articles

This chapter provides a summary of the articles comprising this thesis. In relation to the stated goal of my thesis, to view it as an emergence, the reader should bear in mind that the article summaries correspond to their appearance in the different journals. They are tailored to a specific readership and answer their own stated questions, not the main inquiries of the thesis as a whole. Nevertheless, at the end of each summary I briefly state how the article in question answers the inquiries of the thesis as stated in the introduction; this is an exploration I develop and deepen in the discussion chapter of this thesis.

Article I

Conflating scholarly and science communication practices: the production of open letters (Journal of Documentation, 2020)

This article is based on interviews with the initiators of the open letters, and it explores the interfaces between scholarly and science communication practices. Taking practices as a point of departure, and more specifically peer review practices, professional community-building practices, and communication as a “merit-making” practice, the article argues that a conflation of scholarly and science communication not only concerns texts and genres, but also practices integral to contemporary science. Using a contextual triad consisting of the institutional academic environment, the climate change communication environment, and the open letters seen from a genre perspective, this study aims to highlight how conflating communication practices and perceptions involved in open letter communication are linked to these specific fields of influence.

The study starts from the premise that although academic communication practices constitute a widely researched area, they have mostly concerned what is generally thought of as scholarly communication: peer-to-peer communication through articles, conference papers, and so forth. But academic communication also comprises communication with other types of audiences and through means other than scholarly papers. For example, blogs, opinion pieces, open letters, and communication practices involved in their production are under-studied. This is relevant, since practices produce specific realities (Felt & Davies, 2020, p. 29-30). In relation to scholarly communication, the practices scientists undertake in this endeavor have been seen as constitutive of science (Biagioli, 2002). Thus, I ask the question whether these practices are exclusive to specific forms of scholarly communication or whether they are also employed in textual production aimed at diverse audiences.

Another driving motivation for the study concerns the growing sense that the boundaries between scholarly and science communication are becoming less defined and blurred (Fry, 2006; Kjellberg, 2010; Kjellberg & Haider, 2018; Mehlenbacher, 2019). These findings are backed by studies using textual analysis to illustrate the incorporation of different genres often thought of as belonging to different spheres (Kjellberg, 2010; Mehlenbacher, 2019). From a textual perspective, open letters constitute one genre, while at the same time, texts conceal the actions involved in their production. As such, probing the practices of communication may reveal elements of conflation between scholarly and science communication that are different from the visible external attributes discerned in text.

The article focuses on three practices deemed central to scientific communication; I call these peer-review practices, community-building practices, and communication as a merit-making practice. Peer-review practices refer to the variety of ways in which scientists and institutions validate, improve, and evaluate research (Biagioli, 2002; Fitzpatrick, 2010; Lee et al., 2013). Community-building practices refer to the publication and authorship of scientific material in which the artifact—journals, proceedings, (and of course open letters) for example—can be seen to serve as a meeting space that puts researchers in contact with each other, thus producing and enacting a form of scientific communality (Berggren, 2016; Hilgartner,

2000; Merton, 1973; Ziman, 2000). Merit-making practices refer to communication as a strategy for promotion and branding, and as a productivity indicator which counts towards professional promotion (Duffy & Pooley, 2017; Etzkowits et al., 1998; Feldman & Sandoval, 2018; Noonan, 2016). I find that these three practices, seen as constitutive of contemporary science and enacted through scholarly communication, are employed in the open letters in various ways.

Contrary to what one may assume, peer review was conducted for all the letters. These peer reviews were not double blind or single blind. The authors knew the reviewers and vice versa, and the process resembled open peer-review practices (see Ross-Hellauer, 2017). Some interlocutors described the process as one of the most rigorous they had been through, and some had never reflected upon the fact that the letters actually underwent peer review because it was such a natural thing to do with written texts, irrespective of form.

The article links the different forms of peer review to institutional issues—the idea that peer review is something you do professionally—and the climate change environment. The nature of climate change as a politicized topic may have influenced the strict adherence to this practice (Ser-rao-Neumann et al., 2018). Furthermore, the open letter genre can also be seen to accentuate the importance of peer review since the initiators sought signatories and supporters. In several cases, the letters were adjusted to conform to the reviewers and supporters' more conservative views of climate solutions, or worded in less specific terms. Therefore, a contextual perspective highlights how peer-review practices also take shape in the environment in which they are used.

As for professional community-building practices, interlocutors stressed how the open letter initiatives facilitated interaction between academics and other social actors. The signatory process, during which initiators seek supporters for their open letters, was central to this end; it helped to form new academic networks of like-minded people as well as a discursive sense of “we”, a community. At the same time, the congregation of researchers united through the act of signing the letter was more than a symbolic enactment of an imagined community. It had tangible effects on my interlocutors—the sense of a community brought expectations of further

engagements. The fact that open letters made new type of communities possible was not surprising to some of the researchers. They had a slightly negative view of scholarly communication and in particular of journals, which they found lacking in readership and thereby not properly serving as vehicles for either communication or communality. Concurrently, the interlocutors also had a more pragmatic view of signing the letters as a matter of promoting a message with no specific social bonds attached. To understand these contradicting ways of viewing signatories, I explore the climate change context. Climate denial campaigns, political unwillingness to address climate change, and conflicting ideas of how to solve the climate crisis, have contributed to a complex communication environment (see Morgan & Di Giulio, 2018). I argue that this environment has fueled a need for professional communality and contributed to the development of strategic and pragmatic ways of communicating climate change.

As for merit-making practices, it was clear that all the researchers were passionately engaged in the subject they communicated. Nonetheless, many expressed disappointment and frustration over the fact that their public efforts did not translate into academic merits in the same way as a published journal article would. Communication was thought of as an act that should yield professional merits in return. Since communication, and especially public communication, have not always been thought of in this way, it might be fruitful to explore recent developments within the academic context to understand the initiators' call for merit. I argue that the academic reward system in which merit encompasses individual professional gains can serve as an explanatory framework as to why science communication is partly viewed in these terms among the initiators. Since it is primarily scholarly communication which is awarded in academia, science communication means taking a chance with your career prospects; it does not formally count towards academic promotion. Researchers are pushed to think in modes of credit trade-off when communicating. At the same time, if a public communication effort becomes very visible in the public sphere, there is a chance it will yield unofficial merit; public recognition and visibility may translate positively in professional matters. As such, open letters should also be considered from the logic of the academic reward system.

To summarize, the article illustrates how scholarly and science commu-

nication are converging along the lines of the above specified practices. This can be linked to the specific contexts and interrelated issues which inform communication on the topic, such as the politicization of climate change and the professional reward structure shaping academia. This study exemplifies how practices researchers engage in while communicating through open letters need to be seen in relation to larger structural changes within the academic working environment, as well as in relation to the specific environment in which communication about climate change occurs. Thus, genres can be deceptive in that they may obliterate the commonalities between different types of communication. I argue that we should move beyond appearance and explore the practices of communication and the intersections they may reveal between different genres.

The article primarily responds to RQ1: “What does climate scholars’ engagement in open letters contribute to understandings of research communication?” By exploring converging communication practices, it attempts to expand the notion of research communication. In the context of RQ2, which is, “In which ways do researchers intend to make information matter (mobilize information) through their open letter communication practices?”, I use some of the insights of this article to discuss the signature lists and the practice of signing letters as a matter of scaling and of mobilizing information.

Article II

*Fast-food information, information quality and information gap:
a temporal exploration of the notion of “information” in science
communication on climate change (Journal of Documentation, 2021)*

How do concepts inform our understanding of the world and our activities? And what’s in a concept? Open letters make issues visible and inform publics on a specific topic. Indeed, information is central to the open letter initiative, but what does this “information” from a conceptual perspective entail? And how is it integrated into researchers’ communication? In this paper, I explore the interdependencies between the concept of information and the acts of communication from a contextual perspective.

Temporality becomes an entry point for exploring the notion of information and its related connotations.

In information studies research, information is a central yet elusive concept. It has been explored from a range of angles and has been linked to knowledge, quality, truth, materiality, trust, intention, things, processes, objectivity, and entertainment, to name but a few (see Bates, 2005; Bawden & Robinson, 2012; Buckland, 1991; Budd, 2011; Rieh, 2002; Soe, 2018). At the same time, these notions do not have to stand in opposition to each other. A situational approach to information has illustrated that information is contextual and evades set definitions (Cox, 2012; Palmer & Cragin, 2008). Approaching information as contextual also means integrating communication and information since the content of information cannot be separated from the act of communication. Contrary to scholars who see information as an empty concept of secondary importance to communication (Frohmann, 2001; Koopman, 2019), it is worthwhile exploring the terms as integrated and informing each other. Given the centrality of information about climate change in the open letter initiatives, I ask how researchers understand “information”, and how such understandings shape the communication of the subject. I do this by highlighting a specific analytical angle: time and temporality.

Temporality has long been implicitly present in researcher’s definitions of information. To make temporality a central point of inquiry, however, elucidates its presence in shaping our understandings of the world (Haidler et al., 2022). In the few existing research papers addressing information and temporality, information is linked to freshness, newness, and progress (Day, 2001; Peters, 1988); there is a futuristic, forward movement. These characteristics are presented as intrinsic to the concept of information. Other studies using a contextual approach speak of transience, temporal schisms, and static durability, different temporal understandings that co-exist in the same event that derive meaning from various aspects involved in the production and consumption of information (see Matsuno, 1998). Following a situated and contextual approach, I highlight conceptual understandings of information in relation to climate change communication. I seek to understand how my interlocutors’ conceptualizations of information are related to different notions of time as well as to the

topic of climate change. In relation to climate change, temporality constitutes an especially interesting issue to explore since climate is linked to specific experiences and understandings of time, acceleration, the limits to speed, and linear notions to time (see Rosa, 2013).

The article is primarily a conceptual paper that builds on the empirical material created from the first round of interviews with initiators of open letters. In the analysis of the interviews, three concepts linked to information emerged: fast-food information, information quality, and information gap. These figured as entry points for examining in which contexts they were used and how issues of temporality were expressed in relation to the concepts. The analysis is divided into three parts. In the first part, I explored the notion of fast-food information and found that temporal issues linked to the notion of information are directed towards the intention, consumption, and execution of a communicative act. Thus, the “fast” in information has little, if anything, to do with the content of the letters and all to do with the different aspects involved in the act of communicating, including the channels employed for communication, the perceived ability of the reader to digest the information, and the intention of the speaker. In particular, social media and its affordances are perceived as contributing to fast-food information, where word limits, shares, likes, followers, and the low threshold for publication constitute the “fast” in fast-food information. Furthermore, the intent of academic speakers in relation to the affordances of social media was highlighted as an issue which made “fast-food information” of lower “quality”. The platform was seen as better suited for promotion, and thus made information appearing on social media less important.

Information quality, on the other hand, is perceived as being in direct opposition to fast-food information. And just like its counterpart, the “quality” of information has more to do with the communicative act and little to do with the actual content. Quality indicates slow pace, and this decelerated temporal rhythm is linked to the medium of communication, in particular the news media. The news media, in many ways, is perceived as standing in opposition to social media due to its affordances and its ability to have ripple effects in other news media; it is perceived as existing longer in the virtual and non-virtual world. It is slower, and it does not

have the same fast turnover. Furthermore, due to its relative inaccessibility, elaborate preparations of material is needed, which contributes to the idea of information published in this channel as being of higher quality. This medium is also linked to a higher degree of legitimacy, authority, and trust due to long-standing positions in the field, thereby also increasing the quality of information appearing in the news media. Interestingly, the perception of quality as linked to slow timescapes echoes the call for slow timescapes in climate change; temporal accelerations are seen to have contributed to the severity of climate change, and slow temporal rhythms can contribute to mitigate climate change (Adam, 1993; Rosa, 2013).

A different picture emerges when I examine the notion information gap. Here, the explicit links between the specific content of information and the concept of information are stronger. Despite the fact that other research has shown that a lack of information is not the problem (Buijs et al., 2010), many researchers expressed frustration with what they saw as missing information in the public debate on climate change, which had thus informed their intent to “fill an information gap”. Turning to temporal issues, the notion of information gap signals synchronic time; it exists at one specific point, and it is a type of alarm clock in which a message is highlighted. This can be contrasted with the former notions, which primarily address the rhythm and speed of information. Information gap also highlights temporal schisms between those who are perceived to have information and those who do not. By extension, this can be seen as a question concerning the relationship between different actors in society and their roles and engagement in environmental matters.

I conclude the paper by stressing that a contextual analysis of the concept of information illustrates how the relationship between temporality and information is much more complex than what previous studies have shown. This means moving away from treating specific temporal aspects, such as newness and freshness as intrinsic to the concept of information. Instead, various and seemingly contradictory temporal aspects may coexist and elucidate an activity. In this study, the various understandings of information that the interlocutors express in relation to the open letter initiatives can be seen as an expression of how and why one communicates. Fast-food information and information quality relate to the ques-

tion of how one communicates, while information gap relates to the question of why.

In relation to the main research question, which is, “What does climate scholars’ engagement in open letters contribute to understandings of research communication?”, this article treats temporality as an element of practice which shapes research communication in various ways. Based on this article, I argue for the inclusion of temporality in explorations of research communication. Moreover, this article also illustrates the intersections between communication and information, and their interplay. Furthermore, I draw on this article to respond to RQ2: “In which ways do researchers intend to make information matter (mobilize information) through their open letter communication practices?” In particular, I employ the temporal element of durability to explore notions of mobilization.

Article III

Research communication on climate change through open letters: uniting cognition, affect and action by affective alignments (Science as Culture, 2022)

What is in an open letter apart from the facts and opinions communicated? What else do open letters “do”? One premise of viewing communication as a constitutive practice is that both speakers and publics are produced, shaped, and reformed through communication. This paper uses an analytical approach involving affect to explore discursively created social alignments between actors in the open letters. Furthermore, it explores how and what affective states are perceived as important to action and understanding.

The inclusion of emotions in research communication has long been an ambiguous issue. Emotions have on the one hand been seen to undermine the idea of science as apolitical and objective (see Jacques et al., 2019), yet at the same time, it has also been acknowledged that the inclusion of certain emotions such as wonder, awe, and curiosity in scientists’ public communication is perceived to work in scientists’ favor by creating public good will towards science (Davies, 2019). In environmental communication, emotions are generally researched and used when describing cases of

drowning cities, starving polar bears, or crying children in areas hit by droughts, fires, or floods. They are examples of ways in which the speaker may mobilize public support for an environmental cause. Visuals and evocative language are employed to facilitate the arousal of emotions and to foster emotional responses to climate change (Höijer, 2010; Leiserowitz, 2006; Lockwood, 2016). In written communication, storytelling has been hailed as a way in which affect is employed to foster engagement in climate change issues (Arnold, 2018; Morris et al., 2019). Stories are seen to engage audiences on an emotional level rather than an analytical one; stories encourage experiential processing and affective arousal, which in turn encourage pro-environmental behavior (Morris et al., 2019). Negative emotions such as fear and anxiety are generally treated with caution and as potential threats to action (O'Neill & Nicholson, 2009.). Therefore, based on the valence of emotion, certain affective states are deemed unsuitable for climate communication.

In this paper I take another path. Instead of viewing certain affective states as impeding action, I explore their aligning potential and the social networks they discursively create. Furthermore, I explore the configuration of specific affective states, action, and understanding. In the paper, I look into which affective states in the letters are seen as important to action and understanding in climate matters. I ask, “What affective means are used to communicate climate change through open letters, and in which ways do researchers combine affect, action, and cognition in public appeals to take climate change seriously? How is affect used to form collectives, and which actors make up these collectives?”

For this purpose, an analytical method I call affect as representation and affect as practice is used. Affect as representation builds on Ahmed's (2004, 2010) outline of affect as “sticky” with aligning potentials: affect preserves connections between ideas, values, actors, and objects. Instead of looking at the innate attributes of affect, the performative aspects of affect become central, and Ahmed focuses the lens on the aligning potentials of affect exploring the affiliations they produce between actors, linking subjects with other subjects while creating distance with others (Ahmed, 2010). Textual analysis and attention to linguistically expressed affect in the letters constitute the analytical method affect as representation. In line with

Ahmed's idea of affect as sticky, I explore how affect is connected to actors, ideas, and values.

The second analytical tool is affect as practice. Linguistic analysis is rarely combined with practice approaches due to their different units of analysis (language/practice). However, in the case of the open letters, affect was manifested in several ways that warrant an additional analytical tool. I use a textual practice-oriented view of emotions as embedded in and constitutive of practices (Scheer, 2012). In this paper, I particularly view signing the letter as an affective practice intended to mobilize specific affective states such as authority or respect. This affective practice also ties actors together, forming discursive collectives.

In the first part of the analysis, I find that the affective states of anxiety and concern circulate as affective alignments uniting researchers, activists, business leaders, citizens, and school children in a quest for climate action, while the lack of these specific emotions characterize another group: politicians. Specific affective states, or the lack thereof, thus discursively creates two different groups in the letters. This is interesting for several reasons: firstly, academics take a very active step towards being part of a larger social collective consisting of a wide variety of actors; secondly, as this group is cast as active in climate matters based on their affective affinities, politicians, generally seen as dominant in society, are cast as being marginalized due to their lack of affective responses. As such, discrepancies between the ruling elite and the majority in matters concerning climate change are highlighted.

Furthermore, the specific affective states mentioned—anxiety and concern—are presented as constitutive to understanding and acting on climate issues. Contrary to research that sees the negative valence of specific affect as impeding action, such as with anxiety, the open letters show that anxiety and concern are perfectly compatible with action, and even desired. Indeed, their existence illustrates that people have understood the facts properly. In fact, it is the lack of concern and anxiety which hamper action, and to some extent, understanding.

In the second part of the analysis, I explore affect as practice. I argue that the massive number of academic signatories on the letters forms exclusive social collectives which draw on the social identities of researchers

as experts. Through signatures (in the form of many experts), the letters seek to elicit respect, trust, and authority. At the same time, the discursively formed groups which make up the signatories contradict the linguistically constructed collectives formed in the textual content of the letters.

I conclude that the Janus-faced character of the letters in terms of how affect is used must be seen in relation to wider social and political currents, and does not necessarily create conflicting messages even though the social collectives construed seem to suggest a contradiction. I suggest that in the letters, affect as representation and affect as practice establish specific forms of affect as central to the understanding and mobilization of climate matters. I argue that the specific climate change communication environment has created a context in which trust in the accuracy of information is accentuated. Additionally, social studies illustrating the lack of trust in experts and authorities can explain researchers' tendency to engage in affective practices designed to elicit respect, authority, and trust. Finally, I ask if the social collectives formed in the letter by means of affect as representation are indicative of a type of more socially immersed science, and I speculate as to whether open letters can be seen as artifacts of such engagement.

The article responds to RQ1, which is "What does climate scholars' engagement in open letters contribute to understandings of research communication?", by expanding the breadth of how to employ and understand affect in research communication. Moreover, I make use of the insights from the article to illustrate how trust-making and social alignments constitute ways of mobilization, thereby providing a response to RQ2: "In which ways do researchers intend to make information matter (mobilize information) through their open letter communication practices?"

Article IV

Open letters and climate communication: the professional roles and identities of researchers in times of crisis (Environmental Communication, 2023)

What kind of professional identities do the open letter initiatives on climate change create, sustain, and recreate? In this article, I shift attention from the letters themselves as an object of study to the initiators' understanding of their professional identity and science in relation to their engagement in open letters. Inspired by the constitutive ideas of communication as practices that also affect the speaker (Davies & Horst, 2016; Felt & Davies, 2020), the article investigates the initiators' perceptions of their professional role in relation to climate communication. Identity is an important yet under-studied aspect of communication (Cloud, 2020). Communication can transform external realities and affect speakers' sense of self (Davies & Horst, 2016, p. 14). Furthermore, identities are often described as a resource in that they influence our actions and may anchor the knowledge we want to ascribe to (Jasanoff, 2004). How communication as a practice informs and develops professional identities has implications on how a specific subject, such as climate change, can be acted upon.

At the same time, transformative aspects of communication are usually linked to specific genres and forms of communication, and the transformative potential may be exaggerated at the expense of recognizing the continuities related to professional self-perceptions (see e.g., Carvahlo et al., 2017). This can, for instance, be seen in literature emphasizing the new roles researchers have embraced in relation to climate change, such as engaged science/research and academic activism. In these accounts, communication is often seen as central and transformative since an engaged science and an activist science often require different forms of communication (Rozance et al., 2020; Joosse et al., 2020; Frey et al., 2006). This article supports and explores the transformative potentials of communicative acts but also acknowledges their supposed nemesis, the continuities and stabilizing character of communicative acts in relation to existing professional self-understandings.

The analysis builds on 20 interviews with initiators and coauthors of open

letters involving both the first and the second round of interviews. I employ two analytical devices to probe aspects of identity: practice-inspired analysis and storytelling. The practice-inspired analysis builds on the idea of communication as a constitutive practice that considers the situatedness of communication practices, and it takes into account the different so called elements that enter communicative acts. An element is defined as a building block that together with other elements come together and shape a practice. Elements can be anything from emotions, understandings, values, language, objects, and actors (Schatzki, 2001, p. 11). Importantly, a practice-inspired analysis of communication draws attention to the multiple outcomes of an event, which goes against the idea of specific genres as indicative of professional changes. In this article, I do not explore the elements *in situ*, but rather the interlocutors' own ideas and mention of elements that entered the understanding of open letter communication and had an effect on their professional self-perceptions. More specifically, the article treats institutional regulations, policies, audience-reactions, emotions, the news media, and ideas of science as central elements of open letter communication.

The second tool I employ to sort and analyze my material is storytelling. It is an analytical device that treats the "interview situation" as a form of storytelling; it comprises a sequence of events, turning points, narratives, and emotional attention. In short, the interviewees tell the interviewer a story about themselves in which they make sense of the world and their position in it. The emotions and turning points expressed in the interviews thus become an entry point for understanding the researchers' relationships with other actors in this environment and their perception of themselves (Gabriel, 1991). I see the practice-inspired analytical tool and the storytelling tool as complementing and enriching each other. In particular, the storytelling approach can help to highlight certain elements and the actors' understanding of themselves in a particular setting.

In the first part of the analysis, I treat the transformative aspects of open letter communication in a variety of ways. I illustrate how researchers see open letter communication as a means to free themselves from what they perceive as the shackles and constraints of the academic institution and established scientific values, as well as how open letter communication is a reflection of one's practices as a researcher and what it means to be a

researcher in the midst of the climate crisis, including activism and existential questions. Thus, the first section illustrates how open letter communication chafes against established structures, practices, and understandings of what it means to be a researcher and to engage in science, thereby shedding light on the transformative potentials of open letter communication.

In the second part of the analysis, I focus on the continuities and reaffirmations of existing identities. In light of institutional policies that encourage science communication to the public, along with increasing demands on visibility, promotion, and social impact as valued factors of research, open letter communication was also interpreted as a regular professional task. It could even be interpreted as a specific scientific form of institutionally sanctioned activism through the means of the written word. Thus, the second part of the analysis illustrates how transformative aspects of communication cannot be taken for granted and how the institutional policies and the values of the institution do not necessarily give rise to tensions, but may in fact encourage and legitimize certain forms of communication.

The article concludes that in the case of the open letters on climate change, the communication practice is a reaction against established academic norms, identities, and policies, and it includes an existential dimension which prompts researchers to question what they do in their professional lives. However, the practice also provides a reaffirmation of an established professional role. The interlocutors' understanding of and relations with the actors in the field give rise to different kinds of professional self-perceptions. The open letters and the practices involved in their creation can thus be seen as an emerging type of science radically different from earlier forms of professional self-perceptions. Nonetheless, the practices and the professional role they shape can also be perceived as fundamentally similar to the current role. Some interlocutors see the institution and its policies implicitly supporting open letter engagement. Finally, I conclude that the transformative potential ascribed to a communication form prompts explorations of the practices and understandings of speakers who engage in such activities.

The article responds to RQ1 and RQ3 (How, and in which ways, does open letter communication come to shape, reshape, and affirm researchers'

professional identities?) by highlighting the constitutive aspects of communication in relation to researchers' professional roles.

Article V

Publishing strategies and professional demarcations: enacting media logic in academic climate communication through open letters
(Communications, under review, 2023)

In my fifth article, I continue the exploration of open letter engagement as a constitutive practice that shapes and reshapes researchers' identities. The focus in my last article concerns the ways in which researchers enact "media logic" in their open letter engagements, and why. As a point of departure, I take a look at ideas of mass media which may influence researchers' engagement in open letter communication. The mass media is often perceived as a group of powerful players who shape and decide what is knowledgeable, and attribute credibility to what is being said. As such, the mass media enjoys a strong position in the communication of science to the public (Mellor, 2015; Rödder & Schäfer, 2010). Furthermore, it is argued that the mass media establishes science in the public arena in a specific way (ibid.). In particular, the term "media logic" is circulated as an explanation of a variety of norms and practices in which the media is said to engage and which it popularizes in the public realm. In the context of research communication, media logics and the so called mediatization of every day life are allegedly exemplified in academics' adoption of certain related media practices.

Thus, the mass media is generally seen as shaping and enforcing certain portrayals of science. However, while many studies focus on media logic as an explanatory device, my article shifts perspectives and argues that the term is enacted for a variety of purposes and foremost illustrates relations between different actors. In this article, I describe media logics as ways of mediating perceived power relations tied to the issue of getting heard, seen, and published. Moreover, researchers make an effort to delineate "media logics" and related practices from academic practices, making a distinction between professions, while it is possible to argue that several of the "logics" enacted are not necessarily particular to media as such.

The article is based on material from both rounds of interviews.

I divided the discussion into four parts: the whys and whens of media logic, the whats of media logic, enacting media logic, and the performative characteristics of media logic. I begin by exploring a contradiction in the material, namely that the researchers perceived themselves as powerless and lacking voice even though at the same time they are better placed than other actors to speak in the public arena. I argue that this can be understood and explained by the position researchers attribute to the news media, particularly in relation to the topic of climate change. News media logic then becomes a strategy researchers employ in order to enter this arena, mitigate their perceived powerlessness, and to obtain a voice. I proceed to explore what media logic is to the researchers. Once again, a contradiction emerges as the issues the researchers demarcate as media logic—celebrity worship, confrontation, catchiness, and timeliness—can also be seen as issues pertaining to academic communication. In view of these findings, I suggest that the evocation of media logic works as both a publishing strategy to mitigate power relations and a way to delineate professions, a sort of boundary work to strengthen professional identities. Moreover, the strategies evoked to get published can also work against researchers. Media logic becomes an existing force since it is brought to life by the researchers' enactment of it.

In conclusion, I suggest that the topic of climate change and its "aboutness" —the social discourses surrounding the topic—have formed researchers' understanding of media logics and by extension their enactment of media logic. Furthermore, I emphasize that open letters emerge as a form of communication seen to mitigate a perceived powerlessness. In the context of the news media, open letters also become a type of publishing strategy. Finally, I suggest that evocations of media logic(s) can be used as an analytical device to explore tensions between actors in the larger communication environment, thereby joining other studies that refute ideas of media logics as an explanatory device.

The article responds to RQ1 by stressing how relations between actors in the field also come to shape research communication practices. It also responds to RQ3 since it problematizes media logic as a form of description and treats it as an analytical device to explore actor relations and perceived professional identities.

Discussion

In this chapter I discuss the findings in the articles in relation to my research questions: RQ1) What do climate scholars' engagement in open letters contribute to understandings of research communication? RQ2) In which ways do researchers intend to make information matter (mobilize information) through their open letter communication practices? and RQ3) How, and in which ways, does open letter communication come to shape, reshape, and affirm researchers' professional self-perception?

This chapter is structured along three major subheadings under which I discuss the specificities of the open letters on climate change as a form of research communication, their mobilizing potentials, and ultimately, what they contribute and shed light on as a form of communication. The chapter is divided along the lines of the research questions stated in the introduction. However, it begins with RQ2, followed by RQ3, and ends the discussion with the main research question, RQ1, since this over-arching question is also partly answered through the subquestions.

Under the first heading, entitled *Entanglements of communication and information: practices of mobilization*, I explore aspects of information and communication, and the ways in which the open letters come to mobilize information on climate change. In the second section, *Constitutive aspects of research communication as practice in relation to identities and social collectives: contingencies and ruptures in the climate crisis*, I explore the social, political, and scientific entanglements of climate communication, and the practices and identities shaped by the specificities of the topic and the communication form. These two sections conclude with a short summary of the main points in the discussion. Finally, in the last section, entitled *What does scholars' engagement in open letters contribute to understandings of research communication?*, I raise the question of the sociality of communi-

cation practices, their means of mobilization, and the implications of research communication and its situated patchwork of activities on conceptualizations of scholarly engagement in open letters.

Entanglements of communication and information: practices of mobilization

“I don’t want to go on Twitter, and I don’t want to use it,” my interlocutor said before taking a sip of water, “because I think Twitter really contributes to this superfast information environment, fast-food information environment.” They then proceeded to include Facebook in this equation along with YouTube and TikTok. In fact, they did not rate any type of social media highly in the context of research communication because, as they explained in the above quote, it did something to information, it became fast-food. What can be discerned in this quote is the entanglements between social and material aspects as coproducers of information; information is something that happens in interaction (e.g., platforms like Twitter), not something that exists as an independent unit (Cox, 2012; Haider 2012; Lloyd 2009; Sundin & Francke, 2009; Veinot, 2007). The quote encompasses aspects which often go amiss, such as the coproduction of information when engaging in different types of communication. Information and communication are interconnected and shape each other, but it is not always visible and explicit. The open letters present ways to explore these connections, which I do through the notion of mobilization.

In this section I discuss aspects of communication and information which open letters as a form of research communication shed light on. More specifically, I probe into “the happenings” of information and communication in regard to the open letter initiatives. Apart from epistemic content, what do the letters communicate, and how and why? How are aspects of mobilization approached in the letters? How is information intended to unfold and matter?

In the first subsection, I discuss temporal aspects of mobilization, followed by the mobilization of identities and collectives, and finally I investigate scaling as a means of mobilization.

Temporal mobilizations: the durability and visibility of information and communication

One central feature of open letters is their fluidity in terms of publication venue—they can be published anywhere in their capacity as open letters. However, most letters in this study were published in newspapers (Article II, Article V). This, I suggest, is partly related to *temporal* aspects of information and communication, but also to ideas of power and authority, and it illustrates the complexity involved when choosing a publication venue (Article II, Article V). Indeed, temporal dimensions are implicated in interlocutors' views of communication platforms. When describing information appearing in newspapers, my interlocutors presented ideas of information as having longer durability as opposed to the information on social media. In the views of my interlocutors, newspapers give audiences the chance to digest information (Article II). The perceived long time spans offered by newspapers are seen as ways to make information easier to grasp; durability provides the epistemic content of information with a certain quality. Communication platforms which are perceived to offer these features are therefore prioritized venues of publication. To my interlocutors, it is a way to make information trustworthy and certified. The news media was perceived as offering visibility through a particular temporal dimension that slowly unfolds, at least in comparison to social media. This became very tangible in the interviews; for instance, the word fast-food information kept popping up in contexts relating to social media. A temporal dimension characterized by a fast pace was discarded as unhelpful to “climate information”.

The desire to sustain information as long as possible, to make it durable through the use of a suitable communication platform is by no means an isolated experience related to open letters. Indeed, popular depictions of physical books describe them as preservers of knowledge through time because books are perceived as enduring even after much else has disappeared (Gramini & Dodds, 2023, p.11). Books are here likened to a form of durable communication; durability is mobilized to sustain information.

Apart from durability, other temporal features are present in open letter communication, in particular short timescales, which represent an urgen-

cy and focus on the present, a specific point in time. Open letters constitute a type of alarm clock wherein authors make use of a large number of signatures (Article I), emotions (Article III) or perceptions of “media logic”—here understood as controversy and celebrity bias (Article V)—to highlight a specific point in time, drawing increasing attention to that very moment and communicating urgency (Article II). As such, the synchronic time aspect, that of a flash, of a specified short moment in time, and the long-term durable time perspective are curiously mixed in the open letter initiatives (Article II). They seem, in different ways, to mobilize information through durability and long timeframes for exposure as well as through the short flash, a lightning moment in time. The long timescales and the short timescales represent two modes of mobilization. Mobilization, a key theme in Davies’ (2018) outline of the role of crowds and emotions in contemporary politics and science, is employed by various actors using different means. While Davies primarily highlights the grand and the attention-grabbing aspects of mobilization, epitomized in the politics of crowds (pp. 6-12, 23, 28), there are reasons to also consider the more low-key, mundane types of mobilization. In the open letter initiatives, the expressed desire for the durability of information—a desire linked to the choice of media platforms (Article II)—can be seen as one of these more mundane, low-key ways of mobilization. At the same time, the short, presentist timescales during which signatures are amassed to highlight a message at a particular time (Article II) conform to the louder and attention-grabbing aspects of mobilization. Undeniably, the signatures evoke parallels to Davies’ idea of amassing a large number of bodies to promote a certain form of knowledge and authority (2018, pp. 208-211).

I suggest that temporal mobilization highlights ways in which aspects of the integration between information and communication are made visible. While evoking temporal dimensions by various communicative means, researchers are not only communicating the epistemic content of information; they are also communicating intent, ways in which information is to unfold, happen, and be put into action. Temporality is implicated in ways to make information matter.

Relying on different means of temporal mobilizations can be viewed in light of the complex intersections of science, politics, and social issues

surrounding the topic of climate change (see e.g., Serrao-Neumann et al., 2018). In relation to time and climate change, temporal accelerations, primarily manifested as rapid capitalist accumulations at the expense of sustainable regrowth, have been described as contributors to climate change. In this setting, deceleration becomes the means to mitigate the severity of the climate crisis (Adam, 1993; Rosa, 2013). In order to have a sustained conversation about climate change, there are reasons to view the preference for durability as related to discourses on the topic of climate change. Moreover, climate change is a politicized topic consisting of many voices pulling in different directions. In order to make certain voices heard in the cacophony of different desires, statements, and comments, short timescales that center attention on a specific point in time are valued and used (Article II). This is where elements of practice, including the “aboutness” of information comprising discursive social and political fields of climate change, are especially prominent. The unique composition of climate change in public debates shapes and is shaped by research communication.

Mobilization as a trust-making activity: projected identities and collectives

Trust is an omnipresent component framing interaction in various ways, but it is particularly highlighted and visible when a debate is polarized and when there is a lack of trust among speakers and listeners. The climate crisis constitutes one of these instances in which trust is brought to the forefront. Furthermore, as trust in traditional authorities, including scientists, politicians and the media, is waning in the West (Davies, 2018; Oreskes, 2019; Smulewicz-Zucker, 2018; SR, 2020; Thompson, 2018), how do researchers attempt to enact trust in what they say? I suggest that trust-making constitutes a way of mobilizing information which can take many different forms. As in my discussion on temporality, durability as a means of mobilizing can also be interpreted as a form of trust-making, as it vouches for the longevity of information. Another mode of mobilization exemplified in my material is practices aimed at projecting identities and collectives. In this section, I explore projections of identities and collectives as trust-making activities. I call the specific projections I discerned in the

material *the concerned scientist* and *the concerned citizen*, identities composed of a mix of old and new practices and understandings. I commence the discussion of projected identities in the open letters with the identity I have labelled the concerned scientist. This identity follows a trajectory involving epistemic authority and the position of scientists as knowledge elites in society, and it also encompasses an emotional dimension of the scientific profession, which chafes against the depiction of scientists as unemotional and objective (Article III).

The identities and collectives are projected by various practices. Article I briefly touches upon the signatures in the letters and how the amassment of a large group of academic signatories was perceived as giving weight to the letters (Article I), an issue which I explored in more detail in Article III. The signatures, as viewed in Article III, can be treated as representations of an affective practice aimed at instilling certain emotions such as respect, awe, or authority. It is by virtue of elucidating a specific professional position that awe and authority are elicited. In this scenario, the open letters are trading on ideas of scientists as objective cognitive authorities, a representation that has circulated since the 18th century and forwarded by prominent scientists and philosophers alike, such as Einstein, Weber, Wittgenstein, and Veblen (Proctor, 1991, pp. 219-223). This specific evocation could also be traced to letters that were published in newspapers. A journalistic framing of the letters highlighted that numerous scientists were speaking as authorities in climate matters, thereby emphasizing a specific knowledge authority (Article III). Affective practices here comprise the signatures of the letters and their journalistic framings, and they constitute trust-making activities. Identities, traditionally seen as trustworthy and knowledgeable, are projected at audiences in order to increase trust in what is being said.

In this setting, it is particularly interesting that institutional practices of trust, such as peer review, replication, and transparency, which underpin the idea of science and scientists as knowledge elites, are not explicitly manifested or referenced in the open letters. Adherence to institutional practices often provides ways for scientists to lay claim to epistemic authority, and by doing so, they increase trust in their knowledge claims (Hardos, 2018) Although the initiators of the letters do make use of peer

review, this is not announced to the world and the audiences (Article I). Instead, it is a long and lengthy process that takes place out of the lime-light, and other practices emerge as more central. As climate change goes beyond academia and presents social and political problems of transitions, it arguably requires other types of trust-making activities (see Pamuk, 2022, p.189). Indeed, the type of knowledge authority presented above is primarily displayed as an integral part of a professional identity as scientist. Trust in information is created by mobilizing a certain identity and through the discursive creations of scientific communities. Admittedly, depending on the identity projected, it can also sow discord and distrust among the intended audience. However, what is interesting about the open letters is that they do not only rely on one identity, such as the epistemic authority of a scientist; instead, they use a mix of several identities.

While the particular representation of scientists as epistemic authorities is known and explored (Merton, 1973; Proctor, 1991), open letters on climate change also add another dimension to this representation. Indeed, emotions, which in traditional frameworks chafe against ideas of science as neutral (see e.g., Merton, 1973), are added to the representation of scientists as objective knowledge authorities. As explored in Articles III, IV, and V, the initiators of the letters expressed anxiety, frustration, and concern. To many, the climate crisis did not only require more active engagement among researchers; indeed, active engagement has become a necessary, integral part of being a researcher. Some researchers even viewed their work as futile unless people act on the knowledge they have created (Article IV). While this example carries a sense of dejection and gloom, there were ways in which this type of frustration was channeled into constructive action. Article III illustrates how emotional projections are turned into agents of change. Not only do emotions highlight the writers' own worries and grief about the current situation, but they also illustrate how understanding, action, and emotions are connected: it is in fact rational to be concerned, afraid, and anxious in view of the dire facts about the climate crisis (Article III). In other words, emotions, understanding, and action are interrelated in climate matters. Trust-making activities in the open letters are referencing a traditional sense of epistemic authority, of scientists as established knowledge providers. At the same time, this role is also

infused with that of concern—it is a concerned scientist that is speaking to politicians and citizens.

To be concerned is one of the leitmotifs in the open letters, but it is not only an emotion tied to scientists. The open letters illustrate how scientists also align themselves with citizens, thus projecting an identity of a *concerned citizen*. The existential problems climate change presents disregard professional boundaries and divisions between work and leisure, and it becomes an issue which researchers may struggle with, causing many interlocutors to reconsider their professional role (Article IV). To align with citizens and to make one's role as a citizen more visible were aspects the open letters incorporated (Article III). Researchers put themselves on par with striking school children, activists, citizens, and even business leaders in order to articulate their affinities with these groups and to present their roles as concerned citizens and concerned scientists (Article III). This could be seen as a reaction to the specific existential dimension of the climate crisis.

The specific alignments, where conviviality and togetherness are discursively nurtured, are important components in climate communication and representations of climate change (Song, 2022). Climate issues are plagued by social ruptures and differentiations, while the climate crisis is a problem which demands social collaboration (Song, 2022). In my analysis of the open letters, I find that they nurture certain types of social cohesion, specifically collaborations and affinities between scientists, citizens, activists, school children, and business leaders (Article III). Indeed, the role of a concerned citizen becomes a way of establishing an affinity with others, to discursively build bridges with people who align with their concern of an issue. As such, I view these social projections as a trust-making activity aimed at mobilizing information; these constitute an intent to make information matter. Projected social collectives signal that regardless of status and professional roles, we are all in this together and we can all put information into action.

These more subtle ways of mobilizing information, to establish relationships, project identities, account for accuracy and the importance of information along with the hope that it inspires people to take action, can be seen as an intent to make information happen and unfold. Indeed, trust is an issue which enters the constitutive aspects of communication; it is a

practice, an aspect of information and communication which is present in research communication. Social and material aspects related to trust-making can be seen as elements which make up the open letter initiatives and shape climate communication. Furthermore, to focus on trust is a way to illustrate the different elements involved when communicating. Open letter communication on climate change intersects with the scientific, the political and the social, shaping research communication in particular ways.

Scaling as a means of mobilization: decontextualizing communication and information

In practice theory, the interrelations and interdependencies between issues and fields which may appear disconnected are enacted in practice (Pentzold, 2020; Schatzki, 2001). These interrelations highlight context —practices are situated and can be understood in context.

While the previous sections have illustrated how researchers implicitly acknowledge these interdependencies, such as through the mobilization and projection of identities which navigate the sociopolitical landscape on climate change and through practices recognizing the interdependency between the medium of communication and information, researchers in my study also disregarded relational aspects and, at times, approached open letter communication as a decontextualized activity. These understandings are important to highlight since they stimulate discussion regarding the use of and engagement in open letters.

In this section, I look at scales and scalability in open letter communication. Scalability, which is the scaling of small units onto a larger setting without adapting the original design, is a global phenomena found in businesses, politics, science, as well as climate representations (Pasek, 2019; Pfotenhauer, 2022; Tsing, 2012). Scalability disregards relations and context; it presents ways to scale up without accommodating for local changes (Tsing, 2012). Scales are thereby the opposite of theoretical approaches embracing interdependencies and practices since scales de-emphasize the interconnections between fields, actors, and objects in research communication.

Open letter communication exhibits strands of scaling, primarily in efforts “to scale the message”. In Article II, communication in the news me-

dia is presented as being of higher quality partly due to its ability to create ripple effects in other media and thereby provide information with a longer temporal existence in this medium (Article II). In a way, the media is perceived as a megaphone; the message is scaled up, and it has expanded without, for that matter, changing the content. Likewise, Article V on media logic illustrates the researchers' preference for the news media based on its ability to expand and enlarge a message (Article V). The examples exhibit modes of scalability; information is meant to spread to as many people as possible by maximizing the available medium while at the same time remaining self-contained and intact. It resembles the scaling of a small unit onto a larger setting without changing the format (see Tsing, 2012). However, one of the core problems with climate change, which the letters also call out, is the lack of action, and as Song (2022) pointed out, the lack of social cohesion and collaboration. Can you build social relations when communicating in scales, through a "megaphone" which doesn't take the context into account? In many ways, the "real" problem identified is not the lack of information and loud voices that circulate in different media; the problem is about social relations or, perhaps, the absence of such.

To scale information shares affinities with diffusionist approaches to public communication. A message travels intact, independent, and insulated from any encounters (see Bucchi & Trench, 2014). As a form of mobilization, it is therefore best described as promotion. The rationale is to expand and elevate a message and through this means induce action. Scalability is built on the disregard of relations and the quest for expansion (Tsing, 2012), yet it is the encounters and relations that are at the heart of climate action—social relations constitute a prerequisite for action. The question is thus whether scaling a message in the form of maximizing the use of various media will create the relationships needed for climate action. Perhaps nonscaling and interaction with different actors need more research attention. Instead of focusing on the scalability of a message, a more direct way of interacting with audiences that bring relationships and social transformation in focus would complement and enhance the motives of the open letters, which are to communicate for change. In line with Pasek (2019) who calls for trans-scalar attention in regard to representations of climate change, which incorporates both global and local representations,

I argue that communication strategies cannot only rely on scaling up and expanding a message. They also need to take the relational into account by using different types of media and communication forms wherein relations can more easily be formed with other social actors.

In the open letter initiatives, scaling does not only occur through the maximization of media and their ability to spread the message to as many people as possible; it also occurs in the form of signatures. By increasing the number of people communicating and including supporters of a specific letter, it echoes the scaling involved when media is used as a megaphone—the more voices, the more visible the message. Although consensus is an issue which has been described as a crucial communication component in climate issues, there are also critics who argue that a consensus way of framing questions shares characteristics with the information deficit model, signaling to the public to unquestionably accept scientific authority (Pearce et al., 2015, p. 618). However, what is interesting in the case of signatures is that despite failing to form actual relationships with the intended audience, the process of signing created relations among the signatories. In Article I, I illustrate that relations between the signatories resulted in collaborations for academic papers or the establishment of new organizations/communities in which academics came together to engage in climate issues (Article I). These examples show how scaling does not necessarily prevent relationships from forming. Nevertheless, the type of scaling involved in the process of signing a letter is very different from how the scaling is supposed to work for an intended audience. In the first case, it is centered around a number of people that share a common understanding of climate change and a desire to push for action; scaling can here be likened to networking. It puts people in contact with each other under a common cause and thereby enables relations to form. In the second case, it is employed as a way to increase authority and visibility. Scaling is based on the number of people who think and say the same thing with the intent of increasing authority and/or trust via the mobilization of a large number of voices. This type of scaling runs the risk of impeding relationships to form. Thus, depending on the intention of the letters—what do researchers want them to achieve?—scaling can be employed in different ways and may have different meanings.

Mobilization and the entanglements of communication and information – summary

In this first part of the discussion chapter, I have explored issues of communication and information in the open letter initiatives. Interdisciplinarity is here employed to explore open letters from various angles. In particular, I have been interested in the connections between information and communication, and at times their disconnect, all of which ties into research question RQ2: “In which ways do researchers intend to make information matter (mobilize information) through their open letter communication practices?”

This question has served to structure this first part of the chapter, in which I discuss my suggested conceptual tool of mobilization. Mobilization has been inspired by the practices which my interlocutors undertook in their communication efforts. In particular, I have highlighted how mobilization can be understood as a trust-making activity, a certification of the validity of what is being said, and a form of promotion. More importantly, it marks the intention of my interlocutors to make information matter, and to make it approachable, come alive, and put into action. To this aim, researchers make use of several practices: 1) giving attention to temporality in their publication choices, 2) projecting identities and collectives as a means of tying different groups together or asserting particular identities to enhance the trustworthiness of what is being said, and 3) making use of scales to “scale-up” the message, such as through the display of signatures.

Moreover, by applying and building on concepts and theories from both information studies and STS approaches to science communication studies, I illustrate the interdependencies between information and communication in open letters on climate change through the notion of mobilization, as exemplified in 1) the researchers’ ideas of the temporality of information and its intersections with communication choices, and 2) projected identities, an information and communication practice manifested in the letters by signatures and/or the creation of affective alignments. Finally, the open letters also incorporate scale and scalability which comes with a note of caution since this has various implications depending on the purpose and intent of communicating.

Constitutive aspects of research communication in relation to identities and social collectives: contingencies and ruptures in the climate crisis

During one interview session, my interlocutor suddenly stood up and went to their packed bookshelf. They pointed to the stacks of books that competed for space and held out their arms exasperatingly:

We have the science that we need on climate change, and having more studies is not what we need to actually solve it. So I started to feel like, I cannot sleep at night by just publishing more studies. And most of my studies were about what is bad and in which ways it was bad. And it is bad for agriculture, it is bad for wine growing, it is bad for ecosystems, it is bad for, you know, and at some point I was just like, yeah, we know it is bad! Ha-ha!

As I joined in the laughter, they continued:

And I mean like, having one more study, in one more place, or site refinement of methods, is just an incremental improvement but this is just like not a meaningful way to spend my life. Like, you know, it doesn't matter if I get a Nature paper out of it or something, if what the paper says is like: "yeah, we cannot grow wine on planet earth anymore if we don't stop burning fossil fuels". Like, we should stop burning fossil fuels!

In this quote, my interlocutor illustrates an issue which has become increasingly prominent in the last decade: how to be a climate scholar in the climate crisis (Beaulieu et al., 2018). This issue of how to be a scholar in the climate crisis is manifested in various ways in the letters and the interlocutors' reflections on their engagements in the open letters. In a sense, research communication comes to materialize different aspects of knowledge-making: the scientific, social, and political entanglements of climate change are manifested in practices, representations of social collectives, and especially, in the researchers' own reflections and understandings of their professional roles and institutions.

DISCUSSION

In this section, identity and social collectives constitute points of departure to explore different aspects of communication as a productive practice. I probe how the communication practices that researchers engage in inform, change, and affirm ways of being and becoming. Fundamentally, this section investigates the direction of academia and of academics engaged in climate issues, and it seeks to answer RQ3: “How, and in which ways, does open letter communication come to shape, reshape and affirm researchers’ professional identity?”

Identity, social collectives and the communication practices of becoming

“We are like a committee doing standard work, but just by having a draft of the open letter and looking at it together and the whole experience of doing it together, like it was really an experience of shaping it content-wise that was helpful. But in the end, it was very much this metalevel, like, who we are as a committee, what are we doing as professionals...Those were really the real issues that the letter triggered.” Interlocutor, March 2022

In the previous sections, identities and social representations were explored as trust-making activities and means of mobilization. However, identities can also be seen as indicators of change or stability. As Jasanoff points out, identities are powerful as they inform and anchor our understandings of the world, and often also shape the actions we take (2004, p. 39). In the quote above, the interlocutor stresses the shaping of social identities and professional reflections triggered by the engagement in open letters; this is what they perceive as the metalevel of open letter communication. Practices and identities are here interlinked, and it casts light on the understanding of communication as a constitutive practice—it is shaping the speakers in particular ways; it constructs scientists in specific ways (Davies & Horst, 2016, pp. 53-77). A similar example of the productive metalevel of communication can be seen in the following statement:

I think we all felt a bit frustrated because we had to speak on behalf of the x (institution) rather than speaking on behalf of us, personally. We couldn't

really tell the governments what we wanted them to do, so we wanted to try to maximize the impact in some way, and I think the reason why I did it personally, and x (person), my colleague who was really involved, is that we wanted to come away from the x (conference) thinking that we tried our best to convey the urgency of the climate situations to the delegates. So in a way, I think we did it mostly to ourselves, to try to walk away feeling we did our best and tried our hardest.

Frustration and professional constraints are here enacted, negotiated, and partially circumvented through open letter communication, and the quote encompasses aspects of research communication that often go amiss. Research communication is more than producing a message—it performs and enacts in the world (Davies & Horst, 2016).

As I illustrate in Article IV and which resonates with the quotes above, to some initiators the open letters presented ways to reflect on their professional roles. The genre characteristics of open letters, such as the relative flexibility in terms of wording and the various options for publication, gave space to reform and trying out new or emerging roles, such as a more emotional scientist or a more engaged scientist, liberated from the perceived shackles and boundaries of the institution (Article IV). Indeed, some initiators saw open letter engagement as a form of activism, an activity that also reformed their profession (Article IV). Within these frameworks, engaging in open letters opens up new and emerging ways of being a researcher and it links back to the questions raised by the literature on engaged science and activist academics (Frey et al., 2006; Joosse et al., 2020), and the issue of how to position oneself in the climate crisis and the intersection of one's role as a citizen and as a scientist.

While some of the researchers saw their identities in a transformative light, others projected their identities in line with the institution (Article IV). The academic institution is here brought forward as something researchers may position themselves against or in tandem with, and it influences researchers' understandings of their identity. Although academics are part of a variety of groups—labs, departments, disciplines, and research networks to name a few (Davies & Horst, 2016, p. 73)—my interlocutors primarily, and quite vaguely, spoke of “the academic institution”. In this

context, institution is understood as the specific university where one is employed, as well as the codified behavior and scientific norms that may be shared beyond a specific academic organization. There were, however, other institutions against which researchers compared and formed themselves. In my study, apart from the academic institution, other social institutions contributed to shaping the researchers' self-understandings. In Article V researchers' understandings and use of mass media as an institution with specific norms and codified behavior is explored. The article illustrates how identities are formed and linked vis-à-vis perceptions of this institution—it is a way to separate one's profession from another profession; it is a way to carve out one's identity in opposition to something else (Article V).

Even though the practices which my interlocutors enacted appear similar, they did not interpret their engagement in the open letters in the same way. Indeed, an emotional engagement, or even hints at activist engagements, were by some initiators interpreted in accordance with what they perceived to be currently existing norms and institutional values. To these interlocutors, the open letter engagement did not differ or stand out from other types of communicative engagements; it was part and parcel of what "researchers do" (Article IV). While some viewed open letter communication as slightly political and thereby constituting a way of developing one's professional identity, to others the same characteristics were interpreted as encouraged by the institution. Continuities as well as ruptures can thus be present in the same events, depending on the positioning and understandings of the actors involved. Furthermore, the contingencies and ruptures in regard to my interlocutors' perception of their professional identity may also be an expression of an emerging identity, thus indicating that the researchers were still in a phase of figuring out how to act and how to be in the climate crisis.

To a certain extent, the confusion and phase of figuring out one's professional role in the climate crisis could also be linked to the intersections of different practices the open letter engagements brought forward. As Article I points out, several practices, such as peer review, community building through communication, and merit-making, were present in the open letters (Article I). These aspects are all part of scholarly communication and what has been referred to as constitutive practices of contempo-

rary science—practices that make science into what it is (Article I). I suggest that communication practices anchor and project ideas of science and of society and position actors in society in relation to each other to form specific social collectives.

The implications of these practices, which exist in both open letter communication and scholarly communication, can be seen in the light of discussions on how to position science in society and what being a scientist means in the climate crisis. Overlapping practices that are similar and in line with other forms of research communication may thus contribute to a sense of professional stability and continuation as well as a more hybrid form of professional self whose communication practices overlap in different contexts. Furthermore, the hybrid practices enacted in open letter communication raise questions about how we study research communication: if practices that are deemed “purely scientific” are used in public engagements, does it make any sense to maintain an analytical separation between scholarly communication and science communication? Admittedly, the open letter initiatives add certain practices not often present in scholarly communication. As Article III illustrates, affective alignments between actors and the projection of certain social identities are mobilizing practices which the open letters also highlight as aspects of research communication. They constitute a way for researchers to create links with nonacademic communities such as striking school children, citizens, activists, and business leaders. Together, they form discursive social communities concerned about the climate crisis (Article III), and it becomes a form a meaning-making through which the professional identity is constructed in relation to specific social groups in society outside academia. However, these attempts do not mean that public engagements should be analytically separated from scholarly communication; in fact, it makes sense to view them in tandem. If science communication borrows from scholarly communication, what kind of practices does scholarly communication borrow from science communication? What kind of overlaps and intersections exist between different forms of engagements? For instance, it is noteworthy that the professional award structure, primarily manifested in scholarly communication, transgresses into matters of science communication where the visibility of open letters becomes an asset that plays into matters of merit-making (Ar-

ticle I). Thus, communication through open letters is as much a scholarly peer-to-peer activity as it is a public activity; it incorporates aspects of both “worlds”, for the lack of a better word.

Professional identities and social relations: contingencies and ruptures in the climate crisis – summary

In this section, I have illustrated how open letter communication brings identity aspects to the forefront as researchers find ways to position and reposition themselves in relation to different actors, including the academic institution in the broad sense of the term. How to be a scholar in the climate crisis is a theme upon which open letters provoked reflection. Projected identities and understandings of identities are important as they also may shape our actions (Jasanoff, 2004). Indeed, the practices of communication involved in open letter engagement illustrate a mix between new emerging, and habitual practices. The tensions, intersections, and entanglements between them were also vocalized in researchers’ perceptions of themselves as climate scholars, highlighting emerging ways of being pushed primarily by the climate crisis. First and foremost, researchers are seemingly juggling and navigating the professional role of an academic with that of a citizen, roles that conflate and intersect. In contrast to other scientific roles such as the expert in policy processes (Maasen & Weingart, 2005) or the value-neutral scientist (Merton, 1973), this role comes closer to Marxist ideas of science as transformative social immersion, or to perspectivism, which embraces values since it is thought to make knowledge transparent and objective (Longino, 1990). Furthermore, aspects of social immersion evoke parallels with discussions that have emerged concerning engaged science (Beaulieu et al., 2018) and the activist aspects of being an academic (Frey et al., 2006).

What does climate scholars' engagement in open letters contribute to understandings of research communication?

Community, points of contact, scientists as fellow citizens, coming together—these are words and phrases that my interlocutors often used to describe their involvement in open letters. As one interlocutor stated, “For me, a key feature of an open letter is to invite people to come together”.

In light of my explorations of the social-collective dimensions of identity, professional reflections of identities and the above stated quotes concerning togetherness and community, an issue emerging in my research, is the sociality that communication offers. When it comes to research communication, there have been recent calls for analyses that investigate how “climate communication functions as a social force” (Kumpu, 2022, p. 312) and, more generally, how science communication furthers social connections (Joubert et al., 2019). But what does this social force consist of? And what do the social connections of science communication entail? What my analysis of the open letters on climate change have illustrated, and which I suggest is an important feature of research communication, is primarily the social alignments of communication, or to borrow from Kumpu (2022), the social force of climate communication. In my study, the social force constitutes the social alignments, social connections, and the making and remaking of identities through communication practices. These alignments, I have argued, are representations of being in the world, and they also constitute the experiences among the communicators of becoming and acting in the world. In other words, “change” as spoken of in climate communication does not necessarily have to be directed towards the desired action of others; instead, it can incorporate a personal and individualized dimension where change affects the speaker as they engage in new social communities, or reflect on or reform their professional roles.

Another issue highlighted in the discussion regards mobilization, which I also view as a conceptual contribution. Summarizing the first part of the discussion chapter, I suggest that the open letters on climate change bring issues of mobilization in research communication to the forefront. In my understanding of mobilization, I diverge from ideas of mobilization as

primarily a political feature. Instead, I view it as an intent to make information matter; it is an intent to account for ways in which information is meant to unfold and happen and, additionally, it provides a means to account for its importance. As such, it is an aspect and practice involved in all forms of communication. Although I view mobilization as an activity which transcends the specific context of open letters, I argue that climate scholars' engagement in open letters highlights specific features of mobilization, particularly because the social and political discourse that is played out in the field of climate change makes certain features of mobilization more prominent. In this context, trust-making emerges as an important feature of mobilization, and my thesis illustrates that trust-making can take the form of projected identities and social collectives, or be enacted through communication choices such as preference for the news media, the use of scales in the form of signatures, and a temporal desire for the durability and visibility of the message. These forms constitute both the low-key aspects of mobilization as well as its more visible and attention-grabbing forms.

Furthermore, adopting a view of communication as constitutive signifies exploring the situatedness of practices; even if they appear to be similar, they may acquire different meanings in different contexts. The practices explored in Article I—peer reviews, community building, and merit-making—reveal their intersections with the topic of climate change (Article I). The politicized environment surrounding climate change can be seen to accentuate these different practices; they gain importance in an environment where the issue has been neglected, politicized, and subjected to inaction. In view of this, it is perhaps no surprise that politicians are the prime antagonists in the open letters (Article III). The inaction leading up to the crisis is a political failure, and the affective practices aligning different social actors in the letters are all directed against politicians (Article III). These examples illustrate how aspects of communication borrow from all the different contexts in which climate scholars find themselves. And this context can be confusing to navigate, as experienced by researchers when they reflect upon their professional roles.

Since identities are fluctuating and changing but also reaffirmed, there are several conclusions that can be drawn. There is room for a profession-

al role which departs from both Mertonian ideals of how to be a scientist and frameworks intimately integrating scientists and politicians as experts in policy processes (Maasen & Weingart, 2005). This emerging role can be more immersed in social issues, a role of being both citizens and scientists in the climate crisis. Concurrently, there are also instances when the former roles are reaffirmed and sustained.

The implications of these professional fluctuations and shifts, not only in regard to professional roles (Article IV), but also confluences of scholarly and science communication practices (see Article I), should be reflected in how we approach and study research communication. Instead of treating scholarly communication as a peer-to-peer activity, a transformed social and political landscape requires a broader conceptualization of communication, including public engagement activities and focus on the various ways of mobilizing information. Drawing on information studies, science communication, and the field of environmental communication, I suggest that scholarly and science communication practices conflate and borrow from each other, thus making research communication into a patchwork of integrated contexts and understandings. As professional identities may be formed closer to other social actors, and practices of information and communication intersect and bring together different spaces, an integrated approach to the object of study might enrich our understanding of research communication as a constitutive practice.

Concluding remarks

This thesis sheds light on different aspects of research communication in the climate crisis using an interdisciplinary lens comprising an STS approach to science communication, environmental communication, and information studies. This approach comes with several strengths, but also complexities. How are words and concepts employed in the different disciplines? What implications do conflictual or different understandings of concepts have for the study? Indeed, the conceptual complexities involved when drawing on different fields can be discerned in several parts of this compilation thesis. Perhaps the most prominent feature regards the conceptual understandings of communication and information—when to use the different words/concepts and what one communicates by choosing one over the other. In some cases, communication and information merge; at other times, they are separate and different. Moreover, colloquial meanings of the terms add to the complexity. As such, the different traditions, understandings, and their related praxis inform the object of study and may at times present quite contradictory and conflicting meanings. When is communication an information practice and when is it not? What views of information are implied in the word communication?

At the same time, the strengths of borrowing and merging different research areas represent a wider and broader understanding of the object of study. My articles are positioned in different journals with different disciplinary readers in mind, but as a compilation they come to present a multifaceted picture of the phenomenon I study, which is engagement in open letter communication. These are aspects worth repeating, and in my concluding remarks, I present what I find to be the strengths and main insights gained from this interdisciplinary approach.

First of all, when analyzed together, open letters on climate change as a

form of research communication shed light on both a transformative pattern of communicating—primarily represented by the creation of social collectives and social identities that are projected and experienced—and a diffusionist pattern of communicating. Diffusionist is here understood as the envisioning of science communication as a translation between the scientific community and differentiated publics, where information is seen to travel from one community to another. Open letters trade on the cognitive authority of scientists as knowledge-makers in society and use scalability to promote a message, such as through the mass media and large numbers of signatures. At the same time, open letter communication is more than just a “sent message”; it is a form of action in itself. And this is where the open letters on climate change partly diverge from ideas of climate communication as a means to increase the exposure to, and experiences of, climate issues in everyday life in order to induce action among publics (see e.g., Ballantyne, 2016; Kumpu, 2022; Song, 2022). Indeed, the social alignments, professional reflections, and converging communication practices indicate that it already is a form of action, and should be valued and recognized as such.

The social force of communication, which Kumpu suggests as being a feature of climate communication (Kumpu, 2022), is here understood as the sociality that communication practices offer. It forms connections between actors and forms new understandings of social communities and selves. In this sense, the practices do not have to be geared towards invoking action among others, which is commonly encouraged in climate communication; open letter communication is already inducing change and transformation among the people communicating.

Moreover, the open letters projected identities and social collectives, which may induce climate action among publics in different ways. In this way, they are similar to ideas of climate communication as aimed towards inducing action in others. Admittedly, projected identities and collectives may present obstacles to action since the chosen identities or collectives may not resonate with particular groups and may even exclude groups and communities. However, the social collectives created through communication represent a social issue which has not previously been explored much. As such, I suggest that social alignments present a wide range of opportunities for future research. What kind of social collectives are enacted, created, and

transformed in different communicative events? How are social identities and social coalitions changed, preserved, and pursued? And what kind of action may the social relations and understandings, projected and formed in the communicative acts, inspire? Thus, instead of focusing on the transmission of a message to induce action among audiences, researchers can think strategically about communication in terms of the sociality it offers.

While the social alignments of open letter communication can be seen as indirect ways of mobilizing support and engagement in climate change issues, there are also more direct ways of mobilization that trade on diffusionist conceptions of communicating. I have argued that the ideas of scales and scalability occurring in different forms in the open letters intersect with ideas of transmission and diffusion that largely disregard the relational aspects of communication. Scaling can be social, which the relationships formed among signatories showed, but the potential of scales and scalability to work as a social force in communication is arguably limited and depends on the intent of the person communicating. If the intent is to induce action among audiences, attention to nurturing social relationships with relevant actors must remain central. I simply argue that relational sensitivity should be observed as an integral component of research communication.

Apart from the aforementioned concluding remarks about research communication as a social force, my study also presents theoretical and practical implications. Firstly, the study of scholarly communication and science communication as separate research fields/topics/notions is called into question. Given the overlapping practices and attitudes towards scholarly and science communication that the interlocutors exhibit in this study, an analytical separation of the two may obscure the complexity of social and scientific entanglements in everyday life and may risk idealizing an ideal of science as existing outside politics and social life. Scholarly communication may need a broader conceptualization since open letters are as much a peer-to-peer communication activity as an entity catering to wider publics and politicians.

Secondly, my study has implications for the metric culture related to scholarly output (see Feldman and Sandoval, 2018). Indeed, one may question whether scholarly output is best valued through a metric ranking system and whether metrics and numbers are the best way to assign value to an act. However, if the system is in place and expanding, it does not

make sense to only account for certain types of scholarly output. In fact, there is a case to make for including open letters or other types of “external” forms of research communication in the merit system. In some countries, this is progressing (see Wise et al., 2016). Merit is generally tied to the making of a new claim that is published in a journal or conference proceedings (Frohmann, 2001; Merton, 1973). However, studies suggest that new claims and knowledge are made through a variety of communication forms, such as policy assessments (Oppenheimer et al., 2019). Decisions to reframe or restrict the boundaries of a related scientific problem also constitute ways to produce new knowledge (Oppenheimer et al., 2019, pp. 199-208). Likewise, in open letters, new factual claims are not made, but decisions have been made in regard to how climate change is framed. Furthermore, open letters discursively organize social actors into new collectives. This is a way to put knowledge and facts into action. As such, knowledge is not only made but also put into action, and these kinds of contributions should be valued in their own right. Indeed, the open letters highlight that there is a need to view, study, and account for research communication as something more than factual information, and to explore the happenings of information and communication as they unfold.

In conclusion, I suggest that the open letters on climate change as well as the communication practices involved in their creation can be seen as a form of reflection, resistance, and co-option in the current academic communication environment, mirroring the various contexts in which researchers are situated. As such, the mobilization of identities, practices of scale, ideas of activism or engaged science, emotions, facts, durability, and instant visibility are not phenomena which necessarily constitute each other's binaries or adversaries; rather, they exist in a nexus of interconnected fields and need to be viewed in relation to each other. The continuities, contingencies, and tensions appearing in open letter communication on climate change are shaped by the complex and changing environment in which climate scholars are situated. And as these situated conditions are in flux, and as the climate crisis relentlessly continues to unfold, future research on the topic can only be expected to delve deeper into the conditions of communication and information, thereby expanding our understanding of research communication as a constitutive practice.

JUST NU: Det regnar

► Ordenligt skur i södra Sverige – rör sig norrut

Screenshot by the author from Aftonbladet, June 17th, 2023

Postscript

In the early summer of 2023, the sunny weather in Sweden had caused alarming reports about a dry spell record. When the rain finally came, it made headlines that overshadowed news of the war in Ukraine, gang violence, and inflation predictions, as indicated in the screenshot above from the tabloid Aftonbladet. In this context, where so-called adverse weather events make headlines, the Swedish government had already decided to roll back environmental policies of the former government such as by removing the existing tax on plastic bags (Olsson, 2023). Moreover, there had also been suggestions by a member of parliament in Sweden's post-election political landscape that the climate crisis is not supported by scientific facts (Hedbom & Odelfors, 2022).

Although the developments in one country may be an isolated event, there were indicators that climate pledges and commitment among governments and related agencies in other European countries were cooling off. In the UK, increased civil protest against oil caused the law enforcement agencies to label the climate activist group Extinction Rebellion an extremist group (Dodd & Grierson, 2020); this is a group which one of the open letters in this study also openly supported. Poland, on the other hand, may best be described along the lines of what was not happening, as the government has yet to sign the commitment of reaching climate neutrality by 2050, a commitment the rest of the countries in the European Union have pledged to fulfill (ClientEarth, 2023).

The governments and law enforcement agencies in some of the countries in this study are thus moving further away from their previous standpoint regarding climate issues, or not moving at all. Meanwhile the IPCC issued their hitherto most damning verdict, the synthesis and final summary of its sixth report, once again warning of the dire consequences of climate inaction (Harvey, 2023).

In this setting, it perhaps comes as no surprise that the role of climate researchers in the public debate and their means of communication are more pronounced and discussed than when I began this project. Where are the borders between politics and science, and if such borders exist, should they necessarily be stable? (Thoren et al., 2023, Curie). Can scientists be activists? (Frisk, 2023). These questions keep surfacing in public debates, and they are still as relevant today as they were at the Copenhagen conference, which sparked my engagement in this doctoral project in the first place.

Another enormously significant event, which occurred during my study and came to shed light on the role of science, was the pandemic. As it unfolded during my collection of the open letters, something in the public debate also started to change. The pandemic created conditions under which the role of academics in the public debate became highlighted. While public discussions of the pronounced role of scientists began tentatively, for instance by questioning their means of communication and related skills (Klenell, 2020), the debate became more sustained, and a frequent question asked concerned the role of scientists in relation to policy. “What is policy, what is science, and how do they interact?” became the focus of many discussions, not the least because different countries took different precautions against the disease (Bavec, 2020; Gluckman & Mendisu, 2021; Maani & Galea, 2021).

As the climate crisis unfolds and the expected future IPCC reports look bleak based on the current climate trajectory, public discussions about science’s role in society and researchers’ own reflections of their role can only be expected to become more intense. My hopes are that this thesis contributes to furthering an understanding of research communication on climate change and its related contextual practices. Communication, information, and social roles are never static in a changing world: as the world moves on, so does science and its many integrated, constitutive, and interlinked communication and information practices.

Svensk sammanfattning

Forskningskommunikation i klimatkrisen: öppna brev och mobilisering av information

I den här avhandlingen utforskas öppna brev om klimatfrågor som en typ av forskningskommunikation. Öppna brev är en kommunikationsform som har använts sedan 1800-talet, men lite har skrivits om denna genre. En av de mest populära framställningarna av öppna brev behandlar dem som politiska och populistiska åsiktsyttringar, där man gör en skiljelinje mellan fakta/information och politik/populism. Därutöver återfinns argument som vidhåller att öppna brev är överflödiga i vårt digitala samhälle eftersom social media anses erbjuda samma funktioner som öppna brev. Denna studie utmanar dessa tekno-deterministiska synsätt samt binära skiljelinjer och bygger istället vidare på Davies (2018) idéer om att dessa så kallade binära motpoler är sammanflätade i vad som kan ses som mobilisering av information.

Med utgångspunkt i praktikteoretiska anslag undersöker jag hur forskare kommunicerar i de öppna breven samt hur de uppfattar sin roll som forskare i klimatkrisen. Utgångspunkten är att kommunikation är en praktik som inbegriper mer än förmedling av ett specifikt ämne: kommunikation formar, omformar, förhandlar och förändrar; det är en meningsskapande aktivitet där identiteter, organisationer och fenomen skapas (Davies & Horst, 2016; Felt & Davies, 2020). En praktikteoretisk utgångspunkt tar hänsyn till kontexten, och i denna avhandling utgör klimatkrisen en avgörande faktor med sociala och politiska dimensioner som påverkar kommunikation i ämnet.

Materialet som studien bygger på består av 17 öppna brev om klimatfrågor producerade i en europeisk kontext av forskare verksamma vid europeiska universitet, samt 20 intervjuer med initiativtagare och medförfat-

tare till de öppna breven. Breven och intervjuerna samlades in i två omgångar, 2019 och 2022. Det metodiska tillvägagångssättet utgjordes av en blandning av systematisk sökande efter öppna brev via webbaserade sökmotorer (Google, Start Page), samt en snöbollsmetod där jag introducerades till öppna brev via kontakter. Intervjuerna var semi-strukturerade och behandlade frågor om forskarnas engagemang i öppna brev samt deras syn på sin forskarroll. Materialet analyserades sedan tematiskt där olika teman blev till utgångspunkt för de fem artiklarna. Utöver tematisk analys, bearbetade jag materialet med en praktikteoretisk metodologisk ansats där olika så kallade element uppmärksammades – affekt, aktiviteter, aktörer, objekt, diskurser som utgör och bildar en praktik (Cox, 2012; Lloyd, 2009; Schatzki, 2001). Med denna metod kunde jag undersöka praktiker och de förståelser som understöds och appliceras i kommunikation genom öppna brev. Dessutom tillämpades narrativ analys, där händelser, vändningar och känslor som uttrycks i intervjusammanhang kan ge klarhet kring vad intervjupersonen finner meningsfullt och meningsskapande (Gabriel, 1991; Sharman & Howarth, 2017).

Avhandlingen består av fem artiklar. I de första tre tar jag avstamp i de aktiviteter genom vilka initiativtagarna engagerade sig i öppna brev samt de konceptuella idéer och förståelser de formar. I de två senare artiklarna utforskar jag hur engagemang i öppna brev kan ses som en professionell reflektion, en identitetsrelaterad eftertanke om hur forskare förhåller sig i samhällsfrågor. I dessa artiklar klargör jag hur olika aktiviteter som initiativtagare till öppna brev engagerar sig i kan ses medvetandegöra aspekter relaterade till ens professionella identitet.

Jag ser sammanläggningsavhandlingen som en *emergence* (Hagen, 2011) – ett framträdande – där de olika artiklarna säger något i sig men samtidigt belyser något nytt när de analyseras i relation till varandra. De övergripande frågorna för sammanläggningsavhandlingen är således: 1) Vad bidrar klimatforskarnas engagemang i öppna brev till förståelsen av vetenskaplig kommunikation? 2) På vilka sätt avser klimatforskare att göra information betydande (mobilisera information) genom sina kommunikationspraktiker i öppna brev? 3) Hur och på vilka sätt formar, omformar och bekräftar forskningskommunikation genom öppna brev forskarnas yrkesidentiteter?

I den första artikeln utforskas de praktiker som forskare engagerar sig

i när det skriver öppna brev om klimatfrågor. Slutsatsen är att de praktiker som är mest framträdande i skapandet av de öppna breven – kamratgranskning, samhörighetspraktiker, och merit-skapande – även är centrala delar i forskningskommunikation som berör artiklar, monografier och andra vetenskapliga kommunikationsformer. Jag föreslår därmed att en analytisk undersökning som inte separerar olika former av forskningskommunikation på grund av olika typer av publik kan gagna förståelsen av vetenskaplig kommunikation. Dessutom lyfter jag frågan om mobilisering baserad på insamlingen av underskrifter till breven. Jag argumenterar i avhandlingens kapp för att detta fenomen kan ses som en form av mobilisering av information som utgår från scalability – att skala upp. Syftet är att ett meddelande blir så högljutt och iögonfallande som möjligt för att öka synlighet.

Slutsatserna från den andra artikeln i relation till mina frågor för sammanläggningsavhandlingen visar hur olika former av temporalitet, bland annat varaktighet, beständighet, omedelbarhet, snabbhet och övergångar, är aspekter som påverkar forskares förståelse av information samt vad de vill med information. I sin kommunikation kan forskare därmed ses mobilisera information genom att bejaka tidsaspekter och de verktyg de bäst ser svarar till den temporala avsikt de har med öppna brev. Mobilisering omfattar en tidsmässig, framtidsorienterad dimension, en önskan om att möjliggöra särskilda förståelser och handlingar där information utformas i relation till varaktighet eller omedelbarhet.

I den tredje artikeln, som är baserad på närläsning av de insamlade breven, undersöker jag känslor och så kallade känslopraktiker i text. Mer specifikt undersöker jag hur känslor sammanlänkar olika sociala grupper, samt hur olika skriftliga praktiker ämnade att framkalla känslomässiga reaktioner knyter olika aktörer till varandra. Slutsatserna jag drar från denna studie relaterar först och främst till de sociala aspekterna av forskningskommunikation. Dessutom belyser studien en aspekt av mobilisering som relaterar till förtroende för information. De sociala konstellationer som formas i kommunikation har potential att välkomna olika grupper som medaktörer i klimatfrågor; aktörer som liksom forskare är bekymrade över planetens välmående. Information blir på detta sätt giltighetsförklarad genom sociala grupper ställningstaganden; sociala konstellationer kan ge

aktörer förtroende för information när den involverar dem eller grupper de har förtroende för.

De slutsatser jag drar från den fjärde artikeln behandlar de yrkesmässiga reflektioner som engagemang i öppna brev gav upphov till. Artikeln belyser forskningskommunikation som en konstitutiv praktik som kan forma eller omforma professionella identiteter och förståelser av yrkesroller. I min studie lyfter jag hur initiativtagare kom att ifrågasätta vissa värderingar de kopplade till yrkesrollen, exempelvis neutralitet. De öppna brevens genre-egenskaper, såsom den relativa flexibiliteten vad gäller formulering samt de olika publiceringsmöjligheterna, gav forskarna utrymme att pröva nya eller framväxande roller, exempelvis en mer känslösam eller socialt engagerad forskare. Vissa initiativtagare såg engagemang i öppna brev som en form av aktivism; ett sätt att förändra och utveckla sina yrken. Samtidigt var det inte alltid som kommunikation genom öppna brev sågs som om-danande och omvandlande. Några forskare projicerade sina identiteter i linje med institutionen, och såg engagemang i öppna brev som en aktivitet institutionen understödde. Engagemang i öppna brev var därmed inte något nytt eller nyskapande, utan en del av "vad en gör" som forskare. Den akademiska institutionen lyfts därmed fram som något forskare kan positionera sig emot eller i tandem med, och den påverkar forskarnas förståelse av engagemang i öppna brev.

I likhet med den fjärde artikeln, understryker den femte artikeln identitetsaspekter och kommunikation. Den problematiserar konceptet medielogik och introducerar termen som ett analytiskt instrument för att utforska professionella relationer mellan aktörer i öppen brev-kommunikation. Artikeln belyser forskarnas förståelse av massmedia som en institution med specifika normer och kodifierat beteende. Artikeln illustrerar hur identiteter formas och kopplas till uppfattningar om denna institution – det är ett sätt att skilja sitt egna yrke från ett annat yrke; ett sätt att förstå sin identitet i motsats till något annat. Förutom den akademiska institutionen är således massmedia ytterligare en central samhällsinstitution som bidragit till att forma forskarnas självförståelse när de kommunicerar i öppna brev.

De två senare artiklarna ser engagemang i öppna brev som sätt att visa vägen för nya och framväxande sätt att vara forskare, och de understödjer de frågor som ställts av litteratur om engagerad vetenskap och akademisk

aktivism (se Frey et al., 2006; Joosse et al., 2020) – frågan om hur man positionerar sig i klimatkrisen som forskare och som medborgare. Ett genomgående tema för alla artiklarna är att de understryker hur klimatfrågan och dess sociala och politiska liv kommer att påverka initiativtagarnas praktiker, förståelser och engagemang i öppna brev. Det vill säga, ämnet i sig – klimatkrisen – inbegriper vissa sociala diskurser, politiska debatter och policies, aktiviteter och värderingar som även påverkar kommunikation i ämnet.

I sin helhet drar jag slutsatsen att klimatkommunikation genom öppna brev belyser kommunikationens sociala kraft, här förstådd som de nya sociala gemenskaper och identiteter som formas i olika kommunikationspraktiker. De öppna breven om klimatfrågor är mer än ”skickad information” med avsikt att framkalla handling hos någon annan, i detta fall allmänhet och politiker. Öppen brev kommunikation om klimatfrågor är en typ av handling i sig som kan förändra och omforma de aktörer som är en del av det. De sociala gemenskaperna och sammanlänkningarna, de professionella reflektionerna och de sammanstrålande kommunikationspraktikerna indikerar att det redan är en social handling och bör värderas och erkännas som sådan. Därmed pekar min studie i samma riktning som forskning som ser kommunikation som formande och medskapande, en omvandlande aktivitet som i sig kan ge upphov till förändring.

Jag föreslår även att forskningskommunikation måste ses i sin helhet, och att olika kommunikationsformer inte bör exkluderas från analytisk gemenskap med vad som traditionellt setts som forskningskommunikation, exempelvis forskningsrapporter, artiklar, monografier med flera.

Sammantaget understryker jag även de mobiliserande praktiker som tillämpas i öppen brev kommunikation om klimatfrågor. Istället för att se mobilisering som en politisk aktivitet, betraktar jag mobilisering som en praktik som överskrider populärvetenskapliga och akademiska texter och sfärer. Den kan bidra till att belysa de många sätt som används för att redogöra för förtroendet för information såväl som försöken att göra information trovärdig, viktig och satt i verket. Mobilisering kan artikuleras på olika sätt i olika informationssammanhang och i min avhandling om öppna brev har jag understrukt scalability – tendensen att skala upp; trovärdighet och tillit i relation till sociala gemenskaper, samt temporalitet som

olika mobiliseringsaspekter. I min användning av ordet mobilisering omfattar det sätt att göra informationens epistemiska innehåll trovärdigt, tillgängligt, synligt, aktiverat och satt i verket. Mobilisering är futuristisk i den mening att den inbegriper en avsikt relaterad till hur information ska utvecklas och ske i den offentliga sfären. Att betrakta mobilisering som en fråga som överskrider offentliga och akademiska texter och sfärer kan bidra till att belysa de många sätt som används för att redogöra för giltigheten av och förtroendet för information såväl som försöken att göra information viktig. Betydelsen inbegriper en underliggande tanke om informationens uppenbarelse, görande och blivande i kommunikationspraktiker.

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Appendix

Information letter (first round of interviews)



LUNDS UNIVERSITET
Humanistiska och teologiska fakulteterna

Department of Arts and Cultural Sciences
Lund, 2019

Information concerning PhD project

My name is Carin Graminius and I am a PhD student in Information Studies at Lund University, Sweden. My project, initiated autumn 2018, is entitled Communicating Climate Change: science communication in a post-academic setting. The project is an individual project and not part of a larger research project. The overall purpose of the study is to explore existing pathways for academics to communicate externally on the topic of climate change in different collaborative engagements. In my study, I will look at different types of academic collaborations, related communication techniques and subsequent information content. I am particularly interested in the intersection of science- and scholarly communication, as well as academics' understanding of their professional role in relation to science communication. The primary methods to be used consist of interviews and document-studies. The collected material will form the basis of my thesis and will be published as articles. The collected material will be handled confidentially in accordance with current regulations on research ethics. If not otherwise stated by the interviewee, names will be an-

APPENDIX

onymized in the thesis and in related articles. Participation is voluntary and you can choose to cancel your participation at any time. If you withdraw from the study before data collection is completed, your data will be destroyed. If you have any questions regarding the research, please feel free to contact me. See contact details below.

Best regards,

Carin Graminius, PhD student in Information Studies, Lund University

Email: carin.graminius@kultur.lu.se

Tel: 046-222 30 22

Supervisor:

Jutta Haider, associate professor in Information Studies, Lund University

Email: jutta.haider@kultur.lu.se

Information letter (second round of interviews)



LUNDS UNIVERSITET
Humanistiska och teologiska fakulteterna

Department of Arts and Cultural Sciences
Lund, 2019

Information concerning PhD project

My name is Carin Graminius and I am a PhD student in Information Studies at Lund University, Sweden. My project, initiated autumn 2018, is entitled "Communicating Climate Change: open letters and research communication". The project is an individual project and not part of a larger research project. The purpose of the study is to investigate climate change related communication in order to understand how researchers navigate the complex communication environment of which they are part. Climate denialists, political inaction, as well as the seriousness of the climate crisis are all issues researchers confront when communicating climate change. Originally I meant to investigate different forms of research communication, but settled on one specific genre – open letters – after an initial collection of material in 2019. This round of material collection is a follow-up study to delve deeper into the genre of open letters.

I am particularly interested in the intersection of science and scholarly communication, academics' understanding of their professional role, and what open letters mean or contribute with as a genre of communication. The primary methods to be used consist of interviews and document-studies. The collected material will form the basis of my thesis, and will be published as articles and a PhD thesis.

If you have any questions regarding the research, please contact me at carin.graminius@kultur.lu.se or my main supervisor Jutta Haider, at jutta.haider@kultur.lu.se

Confidentiality

The collected material will be handled confidentially in accordance with current regulations on research ethics. If not otherwise stated by the interviewee, names will be anonymized in the thesis and in related articles. Every effort will be made to preserve your confidentiality including the following:

- Assigning code names/numbers for participants that will be used on all research notes and documents
- Keeping notes, interview transcriptions, and any other identifying participant information in a file cabinet in the personal possession of the researcher.

Voluntary Participation

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you withdraw from the study before data collection is completed, your data will be destroyed.

Kind regards,

Carin Graminius

PhD student in Information Studies, Lund University

Email: carin.graminius@kultur.lu.se

Tel: 046-222 30 22

Interview guide

First of all, thank you so much for agreeing to participate! The time planned for the interview is between 30-40 minutes, but can be shortened/prolonged according to the wishes of the interviewee. The interview is designed as a semi-structured interview with five fields of interests with related questions. The design leaves room for the interviewee to raise his/her interests. I am really looking forward to talking to you and learning more about the open letter initiative!

The fields of interest are envisioned as the following:

1. Questions about the initiative.
 - Why did you write the letter?
 - Why did you choose this specific form of communication?
 - Tell me about the signatory process. What kind of communication channels did you use to reach fellow academics?
 - What “public” did you have in mind when you wrote the letter?
 - Why did you choose to use newspapers/homepages/social media? Why these/these specific channel of communication?
2. Questions about content and style.
 - Tell me more about the style you use in these letters? Why did you choose this style?
 - Would you have written it differently had it been published on a homepage/newspaper/social media?
 - In terms of content, was there anything that you chose not to include in the letter?
3. Questions about reception.
 - How was the letter received?
 - Has anything changed in terms of your professional engagements after the publication of the letter? If yes, what?
4. Questions about science communication in general.
 - What other types of science communication activities do you engage in?
 - How is the letter different from other types of scientific communication you engage in (if it is)?

APPENDIX

- Do you view the letter as science communication? Why?/ Why not?
 - Do you view the production of the letter as a work-task or something you engage in outside work?
5. Questions on science/society relations.
- How do you envision science-society relations in regard to the open letter?
 - How do you envision the role of science in society?
 - In your opinion, what are the boundaries between science communication and activism?

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What happens to researchers when the topic they study poses an existential threat to the world as we know it? When communication on the topic is politically polarized, but at the same time institutionally encouraged and existentially needed? By what means do researchers come to navigate this complex communication environment? The climate crisis and changing social, political, and academic conditions bring such questions to the forefront in researchers' public communication on climate issues.

This thesis engages with open letters as a form of research communication to explore the practices climate scholars engage in to convey information and inspire urgent action in climate matters. Contrary to views of open letters as political opinion pieces used for popular mobilization, this dissertation explores their multifaceted roles through a variety of information and communication practices. The thesis illustrates how open letters provide a space to contemplate one's role as an academic in the climate crisis, emphasizing the transformative and constitutive potential of communication as practice. Moreover, researchers' practices and engagement in open letters on climate change also contribute to reconceptualizing the notion of mobilization, thus expanding the breadth and understanding of how information is put into action.



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