Past the tipping point

Climate change and the public sphere in Germany and the United States

Tschötschel, R.S.

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Robin Tschötschel

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SUMMARY

How we, as societies, communicate about climate change shapes how we understand and possibly overcome this century-defining challenge – or fail to do so. In this dissertation, I argue that public discourse about climate change can face a social tipping point that is marked by a fundamental shift in public opinion, political parties' positions, and media reporting.

My empirical research, comparing Germany and the United States, supports the view that the former has surpassed this crucial threshold: public controversy is predominantly focused on finding solutions, and the media overwhelmingly emphasise consensus around the need to reduce emissions by mid-century. In contrast, the US suffers from a disconnect between public opinion and how media report on the issue, likely aggravating public controversy and perceived differences between supporters of the two major parties. As my findings indicate, once the conversation has 'tipped over', the communication strategies and practices that helped bring about this development are likely no longer effective.

We direly need a faster and more just transition to an economy and society free from greenhouse gas emissions. To help materialise it, communication practitioners can learn from the cases presented to keep moving the conversation forward. By depoliticising geophysical and social scientific insights about climate change and its impact on humans, they can build the foundation for an informed discussion about different solutions to underpin the controversial political debates needed to make future-defining decisions.

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foreword

At the time of writing this foreword in early 2022, the world is a very different place from what it was when I started my doctoral research. In the fall of 2017, Donald Trump, then-president of the United States, seemed to dominate most media reporting on climate politics, also in many European countries. Presumably grateful about the distraction and excuse for their own lack of effort, European leaders continued to largely ignore the need to act rapidly and decisively to reduce emissions at the pace needed. The German elections of 2017 and the government coalition that then took office also made clear that protecting the global climate was not a top issue on the country's political agenda.

In these circumstances, doing in-depth research on climate change communication was a somewhat frustrating endeavour. Especially since the first year of my work was dominated by a study that proved difficult in its technical details and seemed so distant from what mattered to me – figuring out how we could finally have a conversation about how to solve this global crisis. Yet, as a result of that project, I realised that the (European) public conversation about the issue was moving in the right direction. And the nascent Fridays for Future movement started to stir hope that the widespread acceptance of climate science might soon be followed by a political ground shift.

Observing and studying the political events in Europe throughout 2019 gave me new hope and motivation. Seeing that a new generation was taking up the baton and forcefully fighting for meaningful climate politics proved to me that good climate change communication can make a difference. However, observing the monumental shift in public discourse and politics also made me feel that academic research in this field was starting to lag behind the realities on the ground. Most published studies were still heavily focused on convincing people about the existence of climate change and were at odds with the new European reality.

In 2020, I got the chance to put this feeling to the test. I found confirmation that most Germans – unlike US citizens – are rarely swayed by information about the scientific consensus that climate change is real and harmful. As I was writing up this research, Joe Biden was elected president in the US, promising to reduce US citizens' enormous per capita carbon emissions and recognising the value of international cooperation by rejoining the Paris Agreement. Soon after, climate change started to overtake the Covid-19 pandemic as Germany's most important political issue. Arguably this lay the foundation for an election bringing a government into power that declares protecting the climate its "highest priority".

The events of 2021 gave me confidence in interpreting the research I present in this book. I am both personally and professionally convinced that to keep us going in the right direction, we need to talk more about the politically difficult questions regarding all aspects of climate justice. Only this will allow us to keep building momentum and sustain engagement with this future-defining issue. It also is an absolute prerequisite for finding solutions that do not worsen the inequalities that may make it seem like fighting climate change is too costly.

The real-world political developments over the past years make up an essential part of my drive and motivation to pursue the research presented in this book. Yet, actually getting the work done and not giving in to the occasional bout of self-doubt wouldn't have been possible without the help of many people – colleagues, friends, lovers, family, and many others that supported and inspired me.

First and foremost, my supervisors, Anke and Andreas, I want to thank you for your openness and trust. Despite starting with minimal experience in communication science, you gave me the freedom to transform the idea you had brought into existence into something I can now fully call my own. Throughout the years, you combined the exact right amount of radical laissez-faire with gentle guidance and emotional support when things seemed to be falling apart. I remember many meetings that I entered with doubts and worries only to realise that you had my back and would support me in realising even my wilder ideas. I always felt stronger after our conversations and realising this project would have never been possible without you.

I want to thank the members of my doctoral committee, Michael Brüggemann, Joyeeta Gupta, Michael Hammeleers, Theresa Kuhn, and Rens Vliegenthart, for reading and evaluating my work. I am honoured to have you on my committee and that you deem this dissertation ready for the world. Michael (B.), thank you for all our conversations at conferences and for giving me the chance to join you in Hamburg for the coming years. I am looking forward to our future collaboration. Michael (H.), thank you for hosting our PhD club and for the frequent and substantial feedback about my work you offered. Rens, thank you for being a great colleague and director of ASCoR, giving all of us the room to shine.

At ASCoR, many others played important roles in allowing me to make the best of my time there. Damian, you taught me a lot about computational social science methods and co-supervised my master thesis, first putting ASCoR on my mental map. Bert, you offered me great advice and guidance regarding open science, promoting a development that will improve our field as a whole. Wouter, Rachid, and Sjifra, you gave me important methodological counsel that allowed me to take my skills to the next level. Penny, you provided me with a much needed and different perspective on what it means to find your way in academia.

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I would never even have made it to the start of my time at ASCoR without the help of many other academic mentors and their support. I want to thank in particular: Daniel Mügge, my other master thesis supervisor and mentor during the years prior. Learning from you and your approach to research helped me grow tremendously. Anders Blok, who taught me in Copenhagen, thank you for helping me discover my pragmatic style and interests in research. Margit Schratzenstaller, you offered me wonderful first opportunities in Vienna and kept supporting me, even when I had to let them go.

Some people say it takes a village to raise a child, and I certainly felt that I had a fair amount of loved ones taking part in allowing this academic baby to develop – and helping me to grow myself along the way.

Thank you, Christine, mum, for teaching me all I need to find my way in this world. The older I get, the more I appreciate how much of what I can do I owe to you. You gave me the strength and the trust to embrace both my wishes and my doubts and the mental fortitude to make (mostly) good decisions, no matter what comes my way.

Lucy, you have shown me what acceptance truly means, and you've been at my side during my best and my worst. Thank you for your emotional support, unconditional love, and curiosity about what I do and who I am. You are my haven when life is rough and the wind in my sails when it's time to take to the world again.

Pomona, your creativity, passion, and "just-do-it"-attitude keep inspiring me to focus on what I truly care about. Thank you for that and for the creative work you've put into the cover and layout of this book.

Navi, leading by example, you have shown me how to be the weirdest creature I can be and how to cherish myself for all of who I am.

Julia, your strength and perseverance have shown me how to keep going when things get tougher than I could imagine. You also taught me that freedom is something I create and that nobody can stop me from doing so.

Julian and Pablo, you are my home, there are no better words, and I am deeply grateful that I know it will always be like that.

Maria, knowing you for so many years and seeing who you are today, I am deeply grateful for growing into the person I am with you. Thank you for still being around after so many years and helping me understand myself and my past.

Anja, Nele, Markus, thank you for being my family and for allowing me to have a part in your lives. Knowing you're there and that I am always welcome gives me the feeling of safety I need to dare to make my own path.

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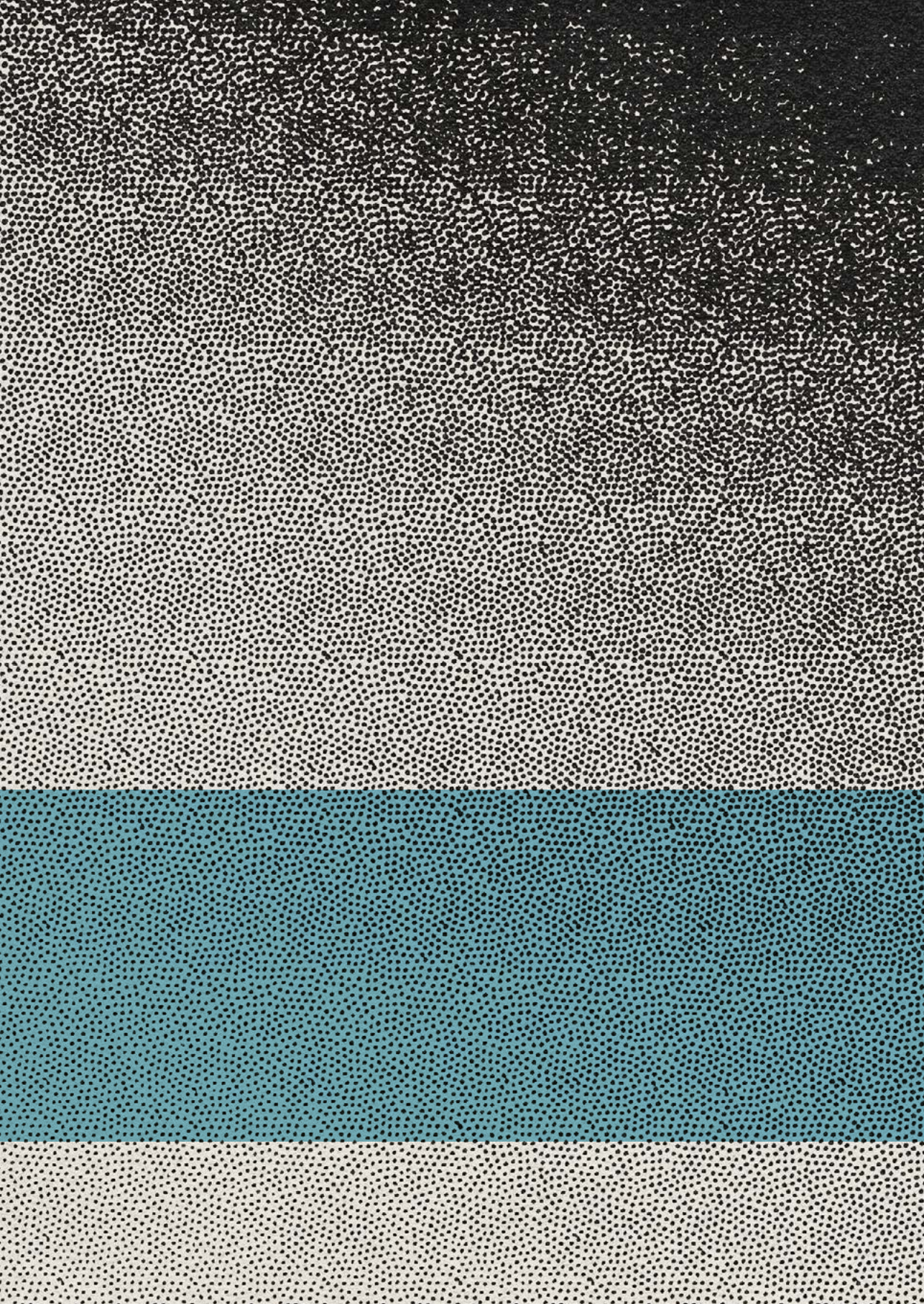


chapter 1

climate change, the public sphere, and this dissertation

Climate change is one of the toughest challenges humanity has had to face in the species' recent history. Its societal and economic causes are complex, and, for many years, its consequences seemed to lie far in the future. In addition, to those chiefly responsible for global warming – citizens, corporations and governments in countries that grew rich while emitting greenhouse gases – climate change appeared chiefly to affect people far away. Under these circumstances, political will to reduce emissions severely, transform the economy, and change the way of life of millions was hard to mobilise. The failure to understand the looming crisis and the lack of political determination has brought us to a point in history at which we can no longer avoid severe climate change. Now, all we can do is put out the fires, literally and metaphorically, by limiting global warming as much and as fast as we can and adapting to its consequences.

To avoid a constantly worsening crisis, almost everybody on this planet needs to change their individual and collective behaviours. Fortunately, most people in the world's richest countries, with the greatest impacts on the global climate, are increasingly ready to do what is necessary. This is understandable, as the consequences of what majorities now rightly see as a global emergency (Flynn et al., 2020) are hitting closer to home and fewer people are willing to accept the suffering of those most severely affected. But we still have complex problems to deal with. Most of us, in particular those at the top of the global income ladder, will have to change which foods we eat, with whom and where we work, what we do for leisure, where we travel – in short, how we go about almost every aspect of our lives.

As we do so, we, as citizens, are faced with numerous tough choices, most of which require political decision-making. For example, we need to figure out who should be the first to abandon the comforts and pleasures we have become used to – and in some cases dependent on because we ignored other options, for example when entire cities are filled with families needing to own at least one car. We must also decide who should pay for putting alternatives in place and what aspects of our lives need to be abandoned when no other options exist, or they are too costly. In the strongly liberal, democratic societies that this dissertation seeks chiefly to address, our public conversations about the challenges we face tend to inform the political decisions made by our representatives. Thus, how we debate climate change and the way we collectively understand the problem are central to determining how we will solve this century-defining problem – or fail to do so.

What does this dissertation contribute to meeting this era-defining political challenge? How can some studies of media coverage and the effects of a very specific messaging strategy help to deal with a crisis so monumental that it is probably going to change the life of everybody on this planet? Alone, they may do very little, that is true. But taken together with some other research in the field of climate change communication conducted over the past decades, they help us understand better why our public conversation has gone astray so many times, ignoring the difficult questions that we should have answered decades ago. And maybe more importantly, I hope to point out what we can do to discuss pressing issues without being distracted any longer by arguments that ignore the reality that we are faced with. Chiefly, I will argue that we no longer need to convince people of the mess we are in. Rather, it is time to push the conversation forward to start debating how we can democratically shape a faster and more just transition to society free of greenhouse gas emissions. Doing so will help us to make the decisions we have avoided for such a long time.

NORMATIVE CHOICES AND DILEMMAS

At this point, some of my readers may feel that what I am aiming to do here is too normative and pragmatic and not at all suitable for a dissertation that should be concerned with empirical research questions, hypothesis testing and theory-development. But I believe that meaningful social research should be explicitly 'value-relevant' (Gray, 1983) rather than ostensibly value-free. And in fact, most research implicitly or explicitly commits to certain values. For instance, when scientists study the determinants and ways of promoting environmentally friendly behaviour, we implicitly make a normative decision that protecting the environment is important, but also that we prioritise the development of tools to manipulate (a provocative term, I know) people into doing so. Overall, since there is some truth in the adage that 'knowledge is power', researchers, in my view, should reflect on and be explicit about their normative assumptions and the consequences that their research may have.

Others may argue the opposite, that my stance does not take a strong enough position and that beyond 'pushing the conversation forward', research should actively commit to political goals. As a citizen and activist, I agree that we need to promote climate justice, giving a voice to the marginalised and further approaches that challenge the political or economic status quo. However, as a scientist and scholar I am cautious about giving answers to questions that are at the heart of politics. What is a fair and just balance of interests between different groups? Should we direct our

solidarity primarily to coal miners having to find new ways of earning an income or farmers struggling to make a living – and sometimes survive! – in the face of rising costs for water and falling yields due to worsening droughts? Whose arguments can be justifiably side-lined for the greater good and to what degree? Can we exclude those continuing to argue that there is no anthropogenic climate change from democratic debate?

While I have opinions on these matters, I think they should not guide research. Rather, embracing a version of the 'all-affected principle' (cf. Näsström, 2011), I believe that research should enable and empower those affected by political decisions to be part of the conversation where they are determined. Finding a balance between my activist goals and identity as a social researcher, I see it as the pragmatic aim for this dissertation to promote a public conversation that embraces difficult political questions and supports a faster and more just transition to an emissions-free society.

Facing difficult realities and promoting democratic decision-making pose a tricky dilemma that I shall grapple with continuously throughout this dissertation. In essence, it concerns the question of who gets to define the facts and answers to normative value-questions – about the climate, human behaviour, our economies and political matters. All the questions pointed at above have what I would call 'factual' components. For example, which regions of the world will become virtually unliveable in is a question that involves mostly facts, not values. Should we still answer this question collectively, or leave it to a group of (scientific) specialists that can define the facts? What if the balance swings towards values not facts? What weighs heavier: the lives of a few dying in a flood or those of the many who could escape poverty more easily by burning fossil fuels? (Ideally, we would find solutions that allow for both, escaping poverty and not dying in floods). In my view, this dilemma cannot be resolved fully, but is important to keep in mind when developing a theoretical lens for interpretation, discussing empirical results, and, most importantly, offering pragmatic recommendations, as I do in the final chapter of this dissertation.

PRAGMATIC AND SCHOLARLY AIMS

From a pragmatic, action-oriented perspective, the aim of this dissertation is clear: to promote a public conversation about climate change that supports a faster and more just transition to a greenhouse gas emissions-free society. As an activist, I am mostly concerned by the question how best to do so? And as a scientist and scholar, I wonder how theory and empirical research in the field of climate change

communication can contribute to this goal. What advice can I give to activists and other communication practitioners? For instance, should we still focus on correcting misinformation, or promoting public debate about politically tricky questions? And what information is central to enable the necessary debates? To answer these questions, I find it crucial, to assess what we know about the public conversation about climate change in different countries. In addition, we need to dive a little deeper into how we think public conversations work and what role they play in democratic decision-making.

These considerations translate into an empirical and a theoretical question that this dissertation seeks to address. From an empirical perspective, it proceeds from the observation that most existing research in the field of climate change communication concerns the United States and other anglophone nations (Moser, 2010, 2016; Schlichting & Schäfer, 2014). Yet, many non-anglophone countries work differently in terms of political and media systems (Brüggemann et al., 2014; Hallin & Mancini, 2004). Thus, there is a need for additional up-to-date comparative research, directed at figuring out how similar or different our public conversations about climate change are in other circumstances, and what can be generalised from different cases. My studies offer a comparison between the US and Germany – the latter being a country that used to be (and arguably still is) similarly dependent on its high-emissions economy but with a very different political and media system (Brüggemann et al., 2014). Studying Germany reveals insights useful for communicators in many other countries – and hopefully soon also those in the US. This comparative perspective informs all studies presented in this dissertation, with different theoretical concerns in mind.

The first study, presented in chapter 2, seeks to build a more solid empirical basis for cross-national comparisons regarding which actors drive media portrayals of controversy and consensus in the United States, Canada, and Germany.[1] Extant research tends to focus on comparing differences in national conversations, for instance in the emphasis on specific issues or arguments, or provides in-depth discussions of an individual case. My study, using quantitative content analysis, investigates the positions taken by different actors in favour or against key statements concerning climate change, offering a level of nuance that is rare in comparative research.

1 While Canada is itself an interesting case, this dissertation focuses on the German-US comparison that is central to the other two studies.

The second study (chapter 3) aims to improve our comparative understanding of how news media in the United States and Germany exacerbate or attenuate political divisions when portraying political actors that engage with climate change. Using a qualitative approach inspired by Actor-Network Theory, it offers fine-grained analysis of how political actors' self-positioning and portrayals of others influence how media present political identities. Theoretically, it connects the field of climate change communication with social identity theory and studies of identity politics – an intersection deserving more attention.

The third study (chapter 4), by way of a conceptual replication, offers evidence about the transferability of communication strategies between the United States and Germany. Employing novel Bayesian statistical analysis techniques, I use a survey experiment to test whether consensus messages, a prominent communication tool with demonstrated effects in the US, have equally strong effects in Germany. I find that important outcomes are largely unaffected by this type of message. I argue that this raises a question about whether message effects in the field of climate change communication are as universal as they are often treated to be.

In the final section of this introduction, I discuss these findings in relation to three key empirical lines of inquiry widely discussed in the research field: how organised climate denial influences our public conversation, what impact political polarisation has on public discourse and on finding effective solutions to climate change, and which communication strategies are most effective at garnering public support.

However, to treat the pragmatic questions at the core of this dissertation with the depth they deserve, empirical insight needs to go along with theoretical reflection. In my view, aiming to enable a faster and more just transition necessitates answering some key questions that cannot be discussed without relying on theory. What is the relationship between politics, science, and society? What role does the public conversation about climate change have in democratic decision-making? What ideals and norms can be used to facilitate a critique of the current state of affairs that can help move the conversation forward? Answering these questions means tackling normative questions and discussing theory that establishes causal relationships between different aspects of the public conversation of climate change at a high level of abstraction. In my view, theories of the public sphere satisfy these needs.

THE PUBLIC SPHERE AND CLIMATE CHANGE

According to Jürgen Habermas, one of the founders of modern public sphere theory (1962, 1981), the public sphere is 'a realm of our social life in which something approaching public opinion can be formed' (Habermas, 2010/1964, p. 114). Often associated with the social field of 'civil society' (Calhoun, 2002), the key idea behind this definition is to shed light on how different actors engage with each other, neither for the purpose of economic exchange nor for executing state function (Fraser, 1992) but, rather, with the aim to discuss the ideas, knowledge and political views that make up public opinion. Note that 'public opinion' in most contemporary scholars' view, and in my own view, is not meant to denote a general consensus, the majority position, or a Rousseauldian 'volonté générale', but rather refers to a multiplicity of attitudes and beliefs that can be in opposition and conflict with each other (Fiig, 2011; Fraser, 1992; Habermas, 2006; Mouffe, 1999). Studying how and why some of these become more influential and consequential is one of the key tasks of contemporary research on political communication and the public sphere.

The definition above brings my understanding of the public sphere close to theories of 'public discourse'. Without going in depth with discourse theory, discourse analysis, or any of the other numerous discourse-oriented approaches (Jørgensen & Phillips, 2002), I take a position that builds on a key tenet of some of these theories. In this dissertation, I adopt what I call a 'deep realist constructivism', according to which meanings and truths are an inter-subjective product of human communicative action that seeks to create agreement about the nature of an objective, yet differentially experienced reality. Taking this stance, the central task of this dissertation is to analyse whose efforts are more influential in this process of negotiating public opinions about reality, shared in what I have so far called the 'public conversation about climate change'. In what follows, I shall continue to use this term along with 'public discussion' and 'public discourse' about climate change interchangeably, referring to publicly mediatised interactions about climate change in its scientific, political and societal dimensions.

The 'public sphere', for the purpose this dissertation, is an umbrella term for the social fields where public discourse plays out. Following the definition above, individual face-to-face interactions can be as much part of public discourse as televised debates between political candidates or performance art. Dahlberg summarises this stance by stating that the public 'refers to the mode, rather than the content or place or medium, of communication' (Dahlberg, 2014, p. 24). As a consequence,

empirically speaking, the public sphere is perhaps best understood as an assemblage of many different 'publics' and different private fora (Breese, 2011; Dahlberg, 2016; Fiig, 2011) that may or may not play a role in the public sphere writ large. To begin with the private side, some acts are intended to have little or no publicity: speaking to a family member or friend about a seemingly private matter for instance (e.g., whether or not they buy an electric car) or internal communication in a corporate setting, where unintended publicity may sometimes result in severe crisis. In the case of the state and policymaking, public-oriented communication is often separate from 'coordinative discourse' (Schmidt, 2011), which can be kept secret intentionally. Thus, next to the public sphere, there exists a whole range of private fora. Which of those should be kept private or be part of a public conversation can be the subject of fierce political – and sometimes cultural – conflict. Some publics may seek to garner wider attention and recognition but remain relatively marginalised due to their specialised nature or cultural norms, or due to being subjugated by political power. And in some cases, the relationship between the public at large and a so-called 'counterpublic' (Fraser, 1992) may be more complicated, when the latter opposes (but potentially seeks to change) hegemonic norms and assumptions about the generally accepted way of discussing an issue in the public sphere.

Notwithstanding the complexity of overlapping publics and private fora, in this dissertation, I focus on the mediatised public at large. On the one hand, I focus on the conversations and actors that appear in media reporting with nation-wide reach. And on the other, I study the opinions and responses to messages held by a representative sample of the national population. While there are good arguments against the 'methodological nationalism' (Beck & Sznaider, 2010) implied by this stance and my comparative approach, most political decisions about how to deal with climate change take place at a national level. Thus, I find it fruitful to focus on national public spheres, while maintaining an analytical openness to the participation (or lack thereof) of actors from outside the national context. Briefly returning to the actors, while individuals are central to most studies of public opinion, it is important to recognise that a wide variety of collective actors also engage with the public sphere: the state, public and private (journalistic) media outlets, universities and scientific professional associations, and others.

WHAT THE PUBLIC SPHERE SHOULD DO

Most theories of the public sphere see it as a central institution of liberal societies, fulfilling one or more key functions in democratic self-governance (cf. Gripsrud et al., 2010). Since a thorough discussion of any particular theory of the public sphere would go far beyond the scope of this chapter, I want to highlight theoretical ideas that can offer a lens through which to view my empirical findings in relation to the pragmatic and theoretical tasks developed above. I presented the strive towards a faster and more just transition as the pragmatic aim for this dissertation. Highlighting the role of communication, I emphasised the theoretical task of offering a critique that could move our public conversation about climate change to debate the political questions associated with this aim. To live up to this task, I find it fruitful to distinguish two theoretical aspects: functional desiderata, concerning the consequences of public discourse on the one hand, and, on the other, the 'normative core' (Bernstein, 2012) of the public sphere, governing the rules of engagement within it. Theories of the public sphere typically link these two by discussing how the failure to realise certain normative ideals stands in the way of achieving its functions, which offers the possibility of using normative ideas as tools for critique. Discussing the normative core in detail would mean moving this dissertation in a theoretical direction at odds with the pragmatic aims outlined above. Thus, in what follows, I focus on the functional desiderata that enable a critical analysis of the outcomes of the public conversation about climate change.

Above, I have developed an account of the public sphere as the realm where a multiplicity of public opinions is formed. In doing so, I set aside some of the other functions that scholars have emphasised, such as the idea that the public sphere should ensure that political decisions actually reflect majority public opinion (Habermas, 1994), that the public sphere is one of the key realms to distribute the immaterial good 'recognition' between social groups (Honneth, 2012), or that it acts as the stage for individual and collective acts of performative self-expression (Tucker, 2005). While such functions are partially present in the subtext of my exposition, to centre them would mean mobilising an altogether different body of empirical data or analytical approach.

Instead, I focus on how public discourse promotes different public opinions and how participants in the public sphere respond to them. Here, I conceptualise public opinions as multidimensional assemblages of beliefs and attitudes of which I shall emphasise three categories: factual knowledge (e.g., whether current policies are enough to reduce emissions to zero by mid-century), political views (e.g., the

question of whether more priority should be given to promoting the use of electric cars or expanding public transport), and ideas about collective identity and self-understanding: who certain groups are, and who does not belong to them, being viewed as their collective 'Other'.

DEVELOPING FACTUAL KNOWLEDGE

Most, if not all matters discussed in the public sphere combine descriptive factual claims (what is the case?) with prescriptive normative considerations (what state of affairs would be desirable?). This is particularly apparent in the case of climate change, where questions about the nature of the phenomenon and its impacts intermingle with debates about how to deal with it – as illustrated by the empirical analysis of how political actors enmesh factual claims with their political views, presented in chapter 3. At a more abstract level, the currently much-discussed challenge of how to grapple with misinformation (e.g., van der Linden et al., 2017; Treen et al., 2020) illustrates the relevance of understanding how public spheres develop and disseminate knowledge, and how this function of the public sphere, in practice, is rarely separate from politics. Following an orthodox reading of Habermasian normative theory, participants in public discourse should offer reasons for their factual truth claims. If participants in the public sphere find ways of agreeing on valid reasons, the public sphere realises a 'truth-tracking potential' (Habermas, 2006, p. 413). Consequently, everything hinges on the capacity for agreement and one way that this could come about is by relegating the decision over what reasons are acceptable to a field of experts – i.e., science.

Such a top-down and consensus-oriented view invites two substantial lines of critique from public sphere scholarship. The first proceeds from a pragmatic angle, highlighting that participants in the public sphere often strategically misrepresent science or do not make recourse to science-based arguments at all. The phenomenon of organised climate denial (see below) is a case in point, and some scholars go as far as diagnosing a 'post-truth' era (Lewandowsky et al., 2017), in which truth claims are wholly disconnected from science and reasoned argumentation. However, other research highlights that climate 'sceptics' selectively use scientific evidence (Schmid-Petri, 2017). This indicates that incomplete reason-giving, relying on non-scientific arguments to underpin 'factual knowledge', and misrepresentation of science, may be equally important elements in explaining the politicisation of facts regarding climate change, as I shall discuss further below.

The second, more fundamental line of critique, emphasises that the top-down consensus-oriented view of how factual knowledge should be developed in the public sphere does not do justice to the fact that access to the scientific field is unequally distributed. As a consequence, reasons that are generally accepted as valid and science-based represent the views of those with privileged access, institutionalising a form of implicit exclusion from public discourse (Dahlberg, 2014). Similarly, if familiarity with scientific reasoning and manners of speech (such as using statistics and specific terminology) are necessary to express one's factual views about the world, this results in a form of implicit exclusion from the public sphere. While inclusion in itself may be seen as an important ideal in the public sphere (see final chapter), exclusion also undermines the inter-subjective basis for finding agreed-upon truths. This can, for example, lead to an under-appreciation of the suffering inflicted by climate change on disadvantaged populations or the young, as is demonstrated by the marginalisation of climate protesters in the United States, discussed in chapter 3.

Both lines of critique, in my view, point towards the need for tackling the question of factual knowledge as open-ended and empirical. This implies asking who advocates for what knowledge and based on what reasons (or lack thereof). For instance, it means restating the concern with organised climate denial and political polarisation (discussed below) as open-ended questions about which factual knowledge is emphasised, the reasons brought forward for factual claims, and the evidentiary basis (e.g., experience-based, science-based or ideological) and the epistemic beliefs that may underpin them (cf. Smith & Lynch, 2020). It also opens up discussion for a critical intervention that builds on an analysis of what knowledge would be needed to facilitate a faster and more just transition, offered in the concluding chapter of this dissertation.

FORMING POLITICAL VIEWS

Above, I analytically distinguished political views from factual knowledge, by emphasising the former's prescriptive and normative character. Political views, as I define them for the purpose of this dissertation, are opinions about desirable states of affairs concerning the good of the collective, individual interests, or anything in between (cf. Breese, 2011; Fraser, 1992) and about the normatively acceptable ways of getting there. This means moving on from the idea that public opinion should be chiefly concerned with 'criticism and control … [of] the ruling structure organised in the form of a state' (Habermas, 2010/1964, p. 115), and acknowledges that political views can address not only institutionalised politics but also economic and civic

life (Breese, 2011) and the public sphere itself. For example, public discourse may criticise the heavy emissions of large corporations or call out attempts at greenwashing, seek to change the strategies of semi-democratically governed entities, such as some pensions funds or exchange-traded companies, or comment on activities in particular areas of practice (e.g., frequent flying for tourism or in the sports and fashion worlds).

An important aspect of the public conversation about climate change is that it can redraw the boundaries of the public sphere and its relation to what is considered the private realm. As discussed above, I conceptualise the public sphere as an assemblage of both public and private fora, and I have emphasised that the relationship between 'the public' at large and its sub- and counterpublics is complex, and potentially fraught with tensions and conflict. As Fraser (1992) and Fiig (2011) highlight, a central aspect of discursive interaction lies in shifting the distinctions between the private and public spheres. In the case of climate change, for example, a public conversation about seemingly private decisions, such as whether to use planes for holiday travel, can lead to the formation of social norms that can have considerable impact (Gössling et al., 2020). As my research confirms, attitudes about what is and should (not) be a public matter is an important element of political actors' identities, as portrayed in the media (chapter 4). Consequently, studying the shifting lines between the public and the private (and who argues for these shifts) is one of the keys to understanding the activities of organised denialism and climate-friendly activists, political polarisation, and what makes successful communication strategies.

Finally, a key question concerns which political topics and issues are discussed in relation to climate change, and which are not. For instance, while the impact of carbon pricing mechanisms on commuters and consumers is frequently discussed, how new building regulations will affect different populations' access to affordable housing is not. The absence of an issue from mediatised public discourse about climate change could be read as a sign that it is largely seen as a private question or has not been politically connected to climate change. Taken together, to understand the political views formed and transformed in public discourse about climate change, research needs to ask who construes which issues as public or private concerns, and who is chiefly addressed as responsible for dealing with them.

SHAPING COLLECTIVE IDENTITIES

Adopting a discourse-oriented approach to identity, this dissertation maintains that individual and collective actors participating in public discourse implicitly, and at times explicitly, engage in a process of reinforcing and transforming identities (Benwell & Stokoe, 2006; Tschötschel & Jacobs, 2021). This view is grounded in social-psychological 'social identity theory', according to which identities are seen as mental blueprints, or 'prototypes', that individuals can, to varying degrees, identify with or see as 'Other' to themselves (Hogg & Reid, 2006) (for a more detailed discussion, see chapter 3). It opposes the view that identities are fixed characteristics of people that can be objectively ascribed, based on demographic variables, and emphasises that the elements of what makes an identity can shift over time. Importantly, seeing identities as changeable mental images means that the different characteristics associated with an identity category can be influenced by communication (Ellemers et al., 2002). In addition, prototypes are not clear-cut, but somewhat 'fuzzy' combinations of different characteristics (Hogg & Reid, 2006) including behaviours, attitudes, beliefs and political views, highlighting that the different functions of the public sphere discussed here can be distinguished in theory, but often intermingle in practice (see chapter 3).

The relevance of the collective identity dimension of public discourse about climate change is illustrated by recent research highlighting how social identity appeals can be used to leverage motivated reasoning to boost the efficacy of climate-related communication (Bayes et al., 2020; Fielding et al., 2019; Goldberg, Gustafson et al., 2019) – a line of research that chapter 4 addresses directly. Interpreted through the lens of social identity theory, this strategy arguably works by transforming the perceptions of what it means to be a member of a certain group, integrating new attitudes and behavioural norms. These effects can work both for or against a faster and more just transition away from greenhouse gas emissions. For instance, when prominent political leaders, such as Donald Trump model climate change scepticism, this can have a strong impact in reinforcing the same type of beliefs among followers (Zawadzki et al., 2020). Understanding how public discourse about climate change transforms or reinforces current social and political identities, embroiling factual beliefs and political attitudes, is a key theoretical and empirical challenge addressed in this dissertation.

Returning to theories of the public sphere, extant scholarly critique has focused on how public discourse can foster the creation of majoritarian hegemonic identities that become oppressive (Korstenbroek, 2021; Mouffe, 1999). This line of criticism

points towards important questions, such as why opposition to greenhouse gas emissions reductions has become a hegemonic aspect of Republican political identity in the United States (chapter 3) and what alternative views of Republican identity exist at the margins. In addition, the critique of hegemony has been mobilised against an orthodox reading of Habermasian public sphere theory. According to the critics, the emphasis on finding consensus about a common good legitimises forms of hegemonic oppression (Dahlberg, 2014; Mouffe, 1999). In response, Habermas has increasingly embraced pluralism (Dahlberg, 2014), in line with other scholars emphasising how discourse can foster the formation of a plurality of identities that allow for new forms of self-expression, and participation, in political and social life (cf. Fiig, 2011). Centralising the notion of identity also helps address the criticism that theories of the public sphere tend to be overly rationalist and universalist, focusing on arguments rather than the actors advancing them (Korstenbroek, 2021). In this dissertation, I build on these debates by asking how the public spheres in Germany and the United States shape (i.e., reinforce, transform or generate) political identities in relation to climate change, and what role organised climate denial and political polarisation play in this process.

Overall, in my view, focusing on the three associated functions — developing factual knowledge, forming political views and shaping collective identities – allows for an integrative analysis of how climate change is discussed in the public sphere. Regarding all these aspects, the key empirical questions are: what is being discussed? How is this discussion taking place? Who advances which facts and views? And finally, what effects do the observed patterns have that could guide strategic interventions in the public sphere?

DENIAL, POLARISATION, AND STRATEGIC COMMUNICATION

Evaluating and criticising the public sphere in terms of some functional desiderata is an important endeavour for solving the theoretical and pragmatic puzzle of how to move the conversation about climate change forward. But doing so requires solid grounding in empirical research. In the following three sections, I offer evidence from studies – my own and others' – conducted over the past four years, that allow me to address three central debates in contemporary climate change communication research. These are framed in empirical terms but, on occasion, I point out the relationship to the functional desiderata of the public sphere, foreshadowing an in-depth discussion in the final chapter of this dissertation.

FROM CLIMATE DENIAL TO POLICY RESISTANCE

A considerable body of literature in the field of climate change communication focuses on various forms of climate change 'scepticism' or 'denial'. This focus has its roots in the history of climate change as a subject in the public sphere. In the 1970s, '80s and early '90s, politics and the media seemed to embrace the early warnings of climate scientists in both the United States (Bolsen & Druckman, 2017) and Germany (Schäfer, 2016). However, when greenhouse gas emission-reductions became a real political possibility with the adoption of the Kyoto Protocol, the affected industries in the US reacted by sponsoring a campaign intended to stop the protocol's ratification in Congress (Bolsen & Druckman, 2017). The strategy employed consisted of undermining political and public acceptance of emissions-reducing policies by framing climate science as uncertain. Financed by industry interest groups, conservative think-tanks, lobbying groups and Republican politicians participated in the concerted political and media campaign (Dunlap & McCright, 2011). While first a national phenomenon, the so-called 'climate change countermovement' (Brulle, 2014) soon turned international, with political and media influence across the globe (Dunlap & McCright, 2011), albeit less so in non-anglophone countries (Painter & Ashe, 2012) and with a rather limited impact in Germany (Schäfer, 2016).

Notwithstanding this historical background, recent research highlights that reporting on climate change is changing, also in the United States. Conservative think-tanks seem to be shifting their arguments to attack climate policy as economically costly forms of (socialist) 'central planning', increasingly abandoning the lines of argument that question the reality of climate change (Busch & Judick, 2021). Portrayals of positions opposed to climate science are increasingly replaced with a focus on resistance to policies intended to reduce emissions (Schmid-Petri et al., 2017). In addition, conflict about climate science is 'frequent, but accurate' by focusing on political actors' positions, rather than selective attention to climate scientists opposing the far-reaching scientific consensus (Rice et al., 2018), a finding that my research corroborates (chapter 2). However, as the overall amount of coverage of political actors has gone up over the period 1985-2017 (Chinn et al., 2020), this does not necessarily mean that there is less attention paid to arguments critical of climate policy measures.

And indeed, as my own research shows, the climate countermovement is only slowly loosening its grip on US politics. In a comparative study of German and US mainstream media portrayals of climate change (chapter 2),[2] I find considerable differences between the two countries' public conversations over a 6.5-month period surrounding COP 23 in 2017. On the one hand, a much larger share of portrayals in the United States emphasises controversy around either the fact climate change will have negative consequences for humans, or that further emissions reductions are needed. This is to the detriment of a conversation about the question of efficacy, i.e., which measures are needed to reduce emissions effectively. It is noteworthy that discussions couched in terms of efficacy seem to have been quite prominent in the United States during the period 2006-2011. Feldman et al. (2015) and Hart & Feldman (2014) report 35-40 % of articles and cable news reports as mentioning some form of efficacy information. This difference could be seen as one of the successes of the Trump administration, which managed to shift the focus towards political conflict and portrayals of science denial, and criticism of the former – in line with a similar Trump effect on public opinion (Hahnel et al., 2020; Zawadzki et al., 2020).

Taking a closer look at the portrayal of politicians, chapter 3 shows that Republican politicians embraced conservative think tanks' arguments presenting climate-friendly policies as attempts to stage a socialist take-over of the United States. While the climate countermovement is arguably still influential in the US, I argue that this strategy should not be conflated with the simpler forms of climate denialism of days past – even though it may be similarly effective in steering the public conversation away from finding solutions to climate change.

In contrast, in Germany, most media reporting on climate change presents a consensus that emission-reductions are necessary and emphasises controversy surrounding the measures that could be put into place to decarbonise fully by mid-century (chapters 2 and 3). In particular, portrayals of political actors opposed to the scientific consensus on climate change are very infrequent, and a broad range of actors make up the conversation about the political and societal measures needed to tackle climate change. My findings about Germany and the United States fall in line with a global trend that mainstream media increasingly focus on the societal and political dimensions of climate change (Hase et al., 2021). This is not to say that climate science denial has ceased to exist: some counterpublics heavily opposed to climate science continue to thrive in online fora, where they form

2 The study included substantial findings about Canada but I leave that country aside for the purpose of this discussion.

densely linked networks that can attract attention from conservative media (Adam et al., 2019; Treen et al., 2020). However, as my research shows, in Germany this attention is marginal in comparison with the vast majority of media portrayals that emphasise the need to act.

The key take-away from this discussion is to recognise that 'climate denialism' – understood as opposition to the scientific consensus that climate change is human-made, harmful to large populations across the globe, and that urgent action is needed to keep warming below 1.5 C (Intergovernmental Panel on Climate Change [IPCC], 2018) – is becoming an increasingly marginal phenomenon. In the United States, it is being replaced by a narrative that focuses on policy support or opposition, based on political ideology (see more below) and, in Germany, public discourse builds on a consensus around the need to act. While opposition to government-lead intervention to combat climate change might be related to attitudes sceptical of climate science, I caution against conflating the former when thinking about how to craft communications strategies that seek to build majorities for a faster and more just transition. Instead, as I shall argue, a clear recognition of the actual lines of argument and political concerns of those opposed to climate policy is needed to tackle political divisions or build on existing majorities.

POLITICAL POLARISATION AND CLIMATE CHANGE

This shift from climate science to climate politics is reflected in both media portrayals and the communication strategies of political actors on the left and right, and driven by material, scientific, political and cultural trends. Despite this development, or rather because of it, conflicts surrounding climate change are a ubiquitous feature of contemporary politics – both in the United States and Germany. Reviewing the literature on climate politics in the US reveals that one of the key concerns in the field is polarisation – the tendency of the two dominant political camps to hold increasingly opposed and fundamentally irreconcilable positions, undermining the basis for compromise (Bolsen & Druckman, 2017; Clark et al., 2019; Dunlap et al., 2016; McCright & Dunlap, 2011). The reasons for the high levels of polarisation are manifold and the field of communication science has contributed by discussing how patterns of media consumption can reinforce group differences – both generally and with regard to climate change in particular (Feldman et al., 2014; Gustafson et al., 2019; Hmielowski et al., 2020; Slater, 2007; Stroud, 2010; Zhao, 2009). However, as I will argue in this section, while polarisation is a considerable problem made worse by partisan media portrayals of climate politics in the

United States, the German case illustrates how climate change can facilitate new forms of consensus across party lines, that can dominate public discourse about the issue – even when media actively seek to portray conflict and divisions.

At the level of public opinion about climate science and politics, contemporary political polarisation with regard to climate change in the United States is chiefly an outcome of right-wing conservative Republicans not following along as other groups increasingly accepted climate science over the past decade (YPCCC & Mason 4C, 2020). This is reflected at the party level: Democrats have embraced climate change as a social justice issue, while the Republican Party makes opposition to the IPCC a part of their party platform (Party, 2016). While climate change is not the only dividing issue and the US is overall politically polarised (Iyengar & Westwood, 2015), it is an important one, with opinions on the issue being strongly organised along political and party lines (Leiserowitz et al., 2021; Leiserowitz et al., 2020). The United States does not stand alone in this development. Across the anglophone world, opposition to the consensus on climate science is a more prominent feature of right-wing political identity than in western European and post-Communist states (McCright et al., 2015; Smith & Mayer, 2019). The political rift appears to be wider at higher levels of socio-economic status or education (Ballew, Pearson et al., 2020), in contrast to many western European countries (Poortinga et al., 2019) and overall trends across the globe (Czarnek et al., 2020). This indicates, in my view, that views on climate change are a major element of partisan political identity in the United States, but less so in many European countries.

Interestingly though, in the US most people overestimate the differences in opinion between groups, regarding climate change and otherwise (Ahler, 2014; Ballew, Rosenthal et al., 2020; Lees & Cikara, 2021), pointing to the role of communication in exaggerating perceived between-group differences. In the United States, political preferences correlate strongly with patterns of media consumption, much more so than in many other (western European) countries, including Germany (Fletcher et al., 2019). In the study presented in chapter 3, I investigate how media portrayals could reinforce or attenuate actual party positions on climate change. I find that 'polar media', read more exclusively by those leaning to the left or right, tend to reinforce differences between political identities and cast climate change more strongly as a question of identity. This observation, in my view, is part of the explanation for why media consumption and attitudes regarding climate change can be two sides of a 'reinforcing spiral' (Feldman et al., 2014), where 'partisan selective exposure' (Stroud, 2010) to a certain type of media tends to lead to engagement with content that reinforces existing beliefs. An example of this phenomenon can be

found in the development of partisan polarisation over the Green New Deal in the US (Gustafson et al., 2019), where consumers of Fox News (one of the polar media) developed more negative views of the policy initiative than other Republicans.

Turning to Germany, as in other European countries, at the individual level, scepticism about climate science is associated with holding a nationalist political ideology (Kulin et al., 2021) but the share of people holding dismissive or doubtful views about climate change is much smaller than in the United States (Metag et al., 2017). At the level of party politics, most serious climate sceptics have found their political home in the radical right-wing party AfD,[3] rather than dominating the larger conservative 'Union' sister parties CDU and CSU,[4] or the liberal FDP[5]. While German politics seems to experience similar levels of affective polarisation (Wagner, 2021), the federalist institutional setup of the German legislatures (nationally and within each federal state) has meant that most parties are experienced in finding compromise across party lines and political blocs. As I discuss in the study presented in chapter 2, rather than opposing climate science or measures to reduce emissions, German parties, except for the AfD, have positively integrated the issue with their core profiles – both in official party programs and in media portrayals. While German polar media also attempt to emphasise conflict and inter-party divisions on climate change, this rarely leads to portrayals of fundamental divisions over the need to act.

Another element of the divergent patterns of portrayed political polarisation around climate change is apparent when considering the young climate activists that increasingly make their voices heard across the globe. My own analysis (chapter 2) shows that German media tend to portray climate protesters relatively favourably, focusing on their position as a relatively non-partisan, moral and ethical vanguard that struggles for recognition as the future affected. This is somewhat in contrast with other research that finds that German media tend to discount young protesters' intergenerational justice demands (von Zabern & Tulloch, 2021), albeit my findings about the tabloid 'Bild Zeitung' can be interpreted similarly. In contrast to Germany, portrayals of young protesters in the United States are relatively rare on the one hand and tend to subsume their political demands under those of the radical left (chapter 3). This is in line with other research on portrayals of young protesters that finds them portrayed as 'threatening Millennial "Other"' (Morris, 2020).

3 'Alternative für Deutschland', Alternative for Germany.

4 'Christlich Demokratische Union', Christian Democratic Union, and 'Christlich Soziale Union', Christian Social Union – the parties form one parliamentary group, with the latter campaigning exclusively in Bavaria, while the former avoids that region.

5 'Freie Demokratische Partei', Free Democratic Party.

Overall, political polarisation around climate change is a real and concerning issue in the United States – both at the level of public opinion, party politics and media reporting. While my findings confirm this view, they also corroborate existing literature that presents the US as part of a group of 'anomalous anglophones' (Smith & Mayer, 2019). As the German case illustrates, climate change can be a cause for new forms of consensus-building around the need to act, that legitimises the claims of the young as relevant across the political spectrum. This has important implications for the communication strategies used in this context.

DENIAL- AND POLARISATION-ORIENTED COMMUNICATION STRATEGIES

With these findings, just discussed, in mind, it makes sense to take a step back and reconsider what public communication about climate change should achieve. I argued earlier that public discourse about climate change should enable participants to develop factual knowledge, form political views and reshape their collective identities in a way that facilitates a faster and more just transition. Before returning to these somewhat abstract functional desiderata for the public sphere, in the final chapter of this dissertation, I want to take a more concrete angle and discuss what I would call denial and polarisation-oriented strategies and their consequences for two relatively concrete outcomes: behaviour (change) and support for policies to reduce emissions or adapt to climate change.

Taking a step back from the strategies used to influence these outcomes, one long-standing and often-confirmed finding is that demographic factors are relatively weak predictors of policy support and individual behaviour, while beliefs and perceptions of climate science and the policies intended to tackle the issue stand out as central (Bergquist et al., 2021). Among those, Goldberg, Gustafson, Ballew et al. (2020) identify 'worry about global warming; risk perceptions; certainty that global warming is happening; belief that global warming is human-caused; and general affect' as the most important predictors of policy support in the US – although 'perceived injunctive norms' of what people approve and disapprove of made the top 5 for Republicans, replacing general affect. Other research demonstrates the predictive power of different 'efficacy' beliefs: the idea that personal action is possible (self-efficacy) and governmental efforts are effective (response efficacy or outcome expectancy) both predict policy support (Bostrom et al., 2019).

Most studies testing predictors in the German context use slightly different variables, conceptually and empirically (e.g., Gregersen et al., 2020; Schwirplies, 2018), but my own research (chapter 4) shows similar patterns to those in the US: beliefs

that climate change is real, human-made, and will have negative effects are strong predictors of intended behaviour change and policy support, respectively, along with worry about climate change. Concerning efficacy beliefs, my research shows a noteworthy differentiation: perceptions of personal efficacy (self- and response efficacy) more strongly predict behaviour change, while perceived governmental efficacy better predicts policy support. This finding is in line with other studies, with consistent findings across most of the European Union (Choi & Hart, 2021). 'Perceived scientific agreement' about climate change is identified as a central predictor of most key beliefs in the literature (e.g., Ding et al., 2011; van der Linden et al., 2015; Pearce et al., 2013 and is discussed in depth in chapter 3 of this dissertation.

Turning to the ways used to influence these key beliefs, one set of communication strategies focuses on beliefs about climate science and emotional responses to climate change. I would call these 'denial-oriented', reflecting the conjecture that either a lack of understanding – an iteration of the 'deficit model' (Simis et al., 2016; Sturgis & Allum, 2004) – or a lack of problem awareness or risk perception, is at the root of low policy support or unwillingness to engage in behaviour change. For instance, studies have shown that reframing climate change as a public health (Myers et al., 2012) or national security (Bolsen et al., 2019) issue can boost policy support in the United States. However, there are noteworthy signs that denial-oriented communication can cause 'reactance' when recipients question the existence of climate change, are ideologically opposed to measures to reduce emissions, or respond with fear to information about climate change (Scharks, 2016; Zhou, 2016). One key denial-oriented strategy are 'consensus messages' that seek to influence perceptions of scientific agreement as a 'gateway belief' (van der Linden, 2021) that influences other beliefs and ultimately behaviour change and policy support. While there is ample evidence for the efficacy of this strategy in the anglophone context, there is also a debate about the conditions under which consensus messages could cause reactance and backfire (Chinn & Hart, 2021; Dixon et al., 2019; S. van der Linden, 2021; van der Linden et al., 2019; Ma et al., 2018).

Addressing these debates, with evidence from a different communication context, the research presented in chapter 3 demonstrates that the effects of consensus messages are probably much smaller in Germany. Yet, the evidence also is contrary to the notion that consensus messages backfire. I argue that the reasons for this are twofold: on the one hand, broad political agreement with the consensus position on climate science and frequent media coverage of the former are likely to lead to a saturation effect, where individuals are less likely to respond to information they are largely familiar with – in particular those that have entrenched views in

opposition to overwhelming public, political and scientific majorities. On the other hand, a ceiling effect may limit the effectiveness of this strategy: Most Germans generally agree that climate change is real and anthropogenic, are worried about the issue and supportive of public policies to deal with the problem. Messages seeking to further boost these beliefs may simply suffer from diminishing returns. While the exact mechanisms explaining my observations need further study, my findings are in line with other research showing that misinformation about climate change and the inoculation strategies used to fight it are less effective in Germany (Schmid-Petri & Bürger, 2021).

Polarisation-oriented communication seeks to address the gap between the political wings by directly orienting communication towards the political right and, in some cases, further boosting support on the left. It often does so by building on denial-oriented strategies, for example when right-leaning groups most likely sceptical of climate science are specifically targeted (e.g., Benegal & Scruggs, 2018; Goldberg, Gustafson et al., 2019). Most of the approaches in this category build on the notion that political partisans engage in some form of 'motivated reasoning' (Hart et al., 2015; Hart & Nisbet, 2012) or 'cultural cognition' that might influence how people perceive and process information (Newman et al., 2018). While the debate about these concepts is ongoing (Druckman & McGrath, 2019; van der Linden, 2016), political cues in messages have been shown to act as triggers in anglophone countries. For instance, message recipients tend to embrace or reject policies based on opposition to, or support for, the political leaders portrayed as being in favour of, or opposed to, the policy in question (Ehret et al., 2018; Kousser & Tranter, 2018). In contrast to these findings, the study presented in chapter 4 indicates that these effects tend to be marginal in the German context, although there are signs that messages from preferred parties may have somewhat stronger effects.

The findings about the German case make sense in light of the context discussed above: in this country, public discourse about climate change has arguably entered a state of saturation, limiting the efficacy of further messaging that attempts to combat denial and depolarise. Yet, these strategies may continue to constitute an important element in the toolkit of communication seeking to address specific audiences, particularly in the United States. In addition, they may also be useful in other forms of communication that focus on moving the conversation about climate change forward — for example, by depolarising views around evidence from the social sciences that points towards the need for additional policy efforts in most sectors of the economy, or by fostering group norms that promote political engagement with climate change across party lines (Goldberg, Gustafson, &

van der Linden, 2020). As using in-group messengers has been shown to enhance messages – with my findings pointing in a similar direction – having a diverse set of communicators that convey messages will continue to play a key role.

PAST THE TIPPING POINT

The previous section discussed some important empirical insights based on my research, and the field at large, along three lines of inquiry. First, I argue that the influence of the climate countermovement on politics and the media is a marginal problem in Germany and has changed its metaphorical coat in the United States. There, it now appears no longer primarily as outright science denial but as voices ideologically opposed to a purported socialist take-over in the guise of climate policy. Yet, it successfully draws attention towards the question whether emission-reductions are needed, undermining a conversation about which measures could be implemented and how to shape a just transition. Second, while political polarisation is pervasive in the United States and exacerbated by the country's polarised media landscape, the opposite is true in Germany, where the emphasis lies on consensus to act, and conflict revolves around which measures are effective and realisable. Third, probably because of what has been observed, denial- and polarisation-oriented communication strategies are likely considerably less effective in Germany.

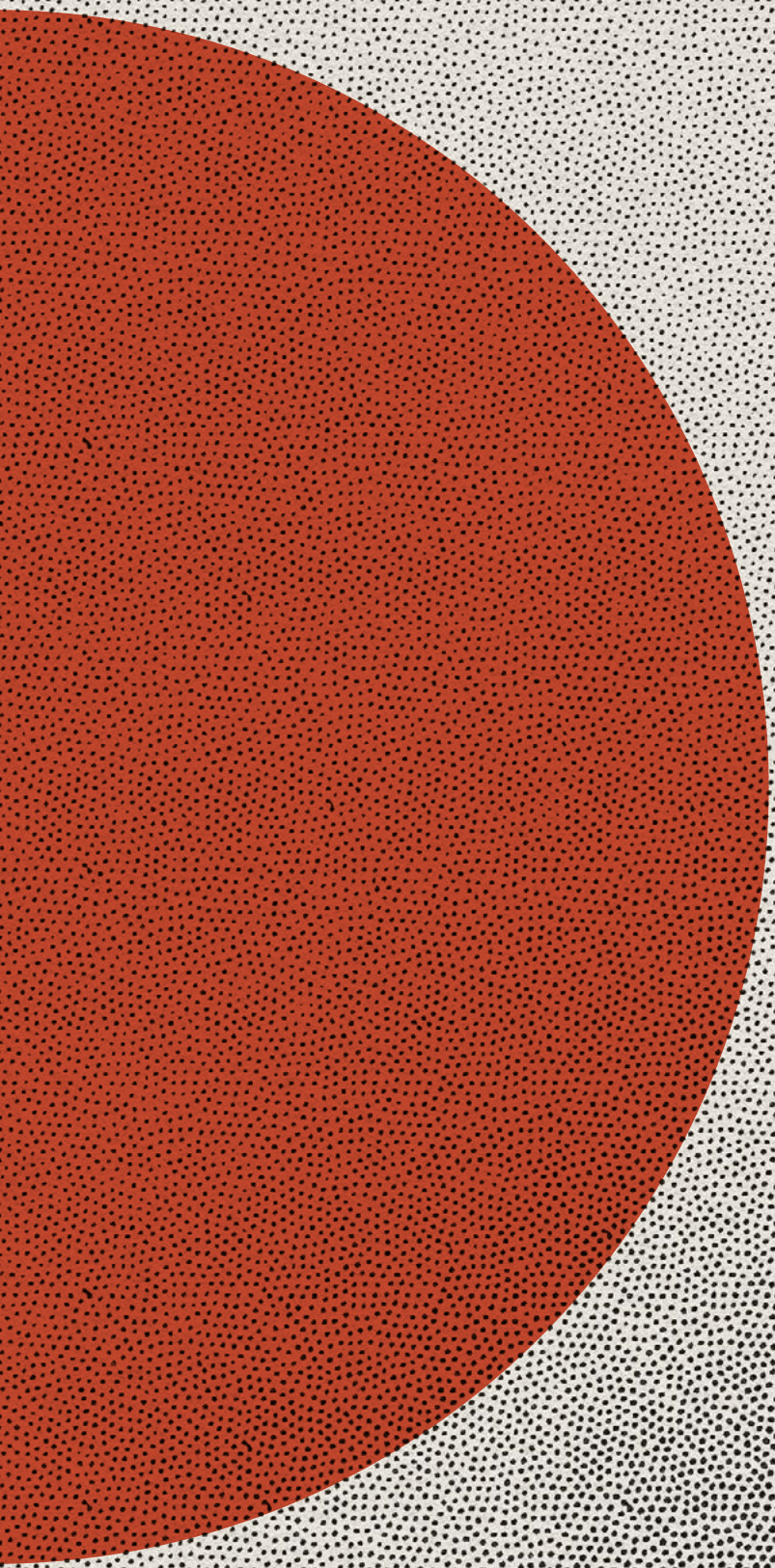
Overall, in my view, these findings present the picture that the German public sphere has moved past a social tipping point concerning climate change. Following Malcolm Gladwell's advancement of the 'tipping point' metaphor (Gladwell, 2000), the notion has become popular in both climate science and social research (Russill & Nyssa, 2009). Climatic tipping points are commonly used to describe a developmental moment, or phase, when slow and gradual change within a climatic (sub-) system turns into a qualitative shift that makes future developments partially independent of the original cause of change (Lenton et al., 2008). In the worst case, this is associated with more rapid, catastrophic, or uncontrollable global warming. Similarly, social tipping points describe how, once a small group of early adopters reach a critical threshold through growth in numbers, their previously unusual behaviours and ways of thinking become normal and spread quickly to the rest of the population (Mahl et al., 2020; Russill & Nyssa, 2009). Social science scholarship in the field of climate communication, politics and psychology has embraced the

idea, debating when and how a social tipping point towards widespread acceptance of climate science, political measures and emission-reducing behaviours could be reached (Moser & Dilling, 2007).

In the case of Germany, Mahl et al. (2020) argue that public opinion stood at, or may have passed, a social tipping point over the period 2015-2019, when citizens' beliefs, attitudes, and communicative engagement with climate change rapidly shifted. Concurring with their analysis and going a step further, I argue that the German public sphere has surpassed the social tipping point, marking a fundamental shift in climate politics and communication. In my view, the empirical insights discussed above support the interpretation that most relevant German political actors (with the exception of the AfD and their supporters), media organisations, and citizens have solidly embraced the need to decarbonise by mid-century as their point of departure for the public conversation about climate change. They are now predominantly approaching the issue in terms of technical feasibility and social implications. Next to my analysis, real-world events seem to be pointing in the same direction: the German constitutional court ruled in April 2021 that federal emission-reduction plans were disadvantaging younger citizens in their right to liberty in the future (Bundesverfassungsgericht, 2021). The federal government reacted almost instantly, revising German climate protection law with tighter emission rules and a new net-neutral target by 2045 (Bundestag, 2021). Nonetheless, leading up to the German federal election of 2021, climate change consistently polled as one of the most important issues among voters (Forschungsgruppe Wahlen, n.d.).

In the United States, the picture is less clear. Ideological opposition to climate policy continues to play an important role in media coverage and politics. However, I would argue that the United States is also at the cusp of tipping over. Climate change communication, as a field of practice, can prepare for that moment by learning from the German case. For instance, I would argue that the climate countermovement's, Fox News' and many Republicans' attempts to make climate politics, rather than climate science, a deep ideological question, are responding to the fact that climate policy can have severe distributional implications. Similarly, Democrats have started to link questions of social and racial justice with the issue of climate change, emphasising that a failure to halt global warming will have severe impacts on already disadvantaged communities. In my view, climate science is playing an increasingly subordinate role in the political back-and-forth of the two parties, with the focus being on the consequences of dealing, or not dealing, with climate change by political means.

Given these circumstances in the two countries, does public discourse about climate change indeed enable citizens to develop the factual knowledge needed, form relevant political views, and reshape their collective identities, in a way that facilitates a faster and more just transition? Yes and no. In Germany, on the one hand, it provides the right fundament for the conversations that need to happen in the future. On the other hand, the topics discussed, and the strategies employed, have not yet embraced the past-the-tipping point context described. And in the United States, in contrast, the debate about the need to reduce emissions still rages, even though it now appears as a more ideological and identity-related question, rather than a scientific one. What needs to happen to facilitate a public conversation that embraces the need to reduce emissions, and puts the focus on the challenge to shape a faster and more just transition? In the final chapter of this dissertation, I will return to this question and present a critical analysis of the current state of affairs in the public sphere – and my conclusions what needs to be done to keep us moving in the right direction.



chapter 2

patterns of controversy and consensus in German, Canadian, and US online news on climate change

ABSTRACT

Individual action and support for policy to tackle climate change have been linked to perceptions of political and scientific controversy and consensus concerning the issue. Recent media effects research indicates that presentation of agreement or conflict between actors' opinions influences how audiences respond to news about climate change and policy. While some national case studies have investigated portrayals of actors' positions on important questions regarding climate change in the media, they are largely absent from comparative research. This study addresses this gap by analysing portrayals of actor-issue-positions and the emerging patterns of controversy and consensus in German, Canadian, and US coverage. Studying a sample of occurrences of climate change-related issues (N = 902) in-depth, the results show German media present political consensus about the need to limit emissions and societal controversy about the efficacy of specific mitigation measures. Presenting mainly consensus, Canadian media report more on climate change's impact, leaving aside the issue of efficacy. In the US, media emphasise political controversy – about the need to limit emissions and occasionally about climate change's impact on humans. The findings, consistent with other recent publications, can best be explained by journalists selectively indexing of seemingly relevant actor-issue-positions.

Keywords: climate change, controversy, consensus, online news coverage, US, Canada, Germany

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INTRODUCTION

As climate change warms the earth's atmosphere and oceans, it also heats up public discussions of the phenomenon. Matters of contention range from fundamental questions about the causes of global warming to detailed disputes over how exactly to achieve specific renewable energy goals and involve scientists, politicians, businesspeople, and citizens across the globe. News media in most countries increasingly make climate change visible (Barkemeyer et al., 2017) and have considerable power over selecting which issues and actors are portrayed. This also means that they decide which issues appear as controversial, consensual, or remain entirely hidden from their audiences. As demonstrated by the literature linking coverage to perceptions of climate change, public engagement, and policy support, such choices can have effects on the recipients of news, but the relationship is complicated, sometimes counter-intuitive, and differentiated between audience groups (e.g., Feldman et al., 2014; Hart et al., 2015; Nisbet et al., 2013).

Recent findings in the field of media effects research suggest that the actors driving controversy and consensus are particularly important in explaining links between news coverage and public beliefs and attitudes about climate change. For example, the perception of consensus among scientists has been linked to engagement and policy support for mitigation measures (Kerr & Wilson, 2018; van der Linden et al., 2015). Some evidence suggests that the portrayed positions of political leaders on climate science and policy influence how audiences react to consensus-reinforcing messages (e.g., Benegal & Scruggs, 2018; Kousser & Tranter, 2018). While extensively studied from a message-effects perspective, actors have received little attention in comparative studies analysing news coverage in multiple countries.

In the communication science literature, media coverage of climate change has been discussed extensively in each national context (Schlichting & Schäfer, 2014). Some of these case studies made issue-specific actor positions and the relations between them the subject of inquiry (e.g., Rice et al., 2018; Stoddart et al., 2017). Comparative research sometimes (indirectly) captures controversy and consensus, for example by studying the 'scientific uncertainty' frame (Schäfer & O'Neill, 2017, p. 13). However, most cross-national studies place little emphasis on the actors presented by the media and focus on dynamics at a higher level of abstraction, such as issue attention (e.g., Barkemeyer et al., 2017), thematic emphasis (e.g., Gurwitt et al., 2017), or the use of frames (cf. Schäfer & O'Neill, 2017). Portrayals of actors, their positions, and the relations between them drive these patterns. Yet, detailed

studies of these underlying dynamics are still strikingly absent from the comparative literature, which means that national case studies remain isolated and their findings difficult to integrate with existing theory.

In order to address this gap, we present a comparative analysis of media portrayals of controversy and consensus in Canadian, German and US news coverage of climate change. These countries are well researched, both as individual cases and from a comparative perspective. They exhibit interesting variation in terms of national politics, public attitudes to climate change, the media system, and journalistic cultures. At the same time, all three are considerably invested in their fossil fuel industries and are subject to international pressure to limit greenhouse gas emissions, which means that variation cannot easily be reduced to seemingly external factors.

In each of the three countries under scrutiny, we study online news coverage – including digital-born outlets and those with roots in print publishing and TV broadcasting – of climate change in media consumed by audiences across the political spectrum during the period 3 months before, during, and 3 months after COP 23 in Bonn in 2017. The timeframe and selection of outlets contains news reporting both idiosyncratic to the national context and driven by a prestigious international event (see Wessler et al., 2016). It thus corresponds well to the range of coverage the issue typically receives.

CONTROVERSY AND CONSENSUS

Presenting controversy is one way of 'generating newsworthiness' (Lester, 1980), by providing an overall narrative that can contextualise individual news items, such as coverage of specific actors' positions found in press releases or media events (Price, 1989). Its effects, however, are ambivalent. Controversy can lead to higher engagement with the issue at stake, as demonstrated in the case of European parliamentary elections (Schuck et al., 2016). However, it can also have demobilising effects, for example when disagreement is linked to 'incivility' (Mutz & Reeves, 2005).

In the field of climate change communication, controversy has proven particularly pertinent: public perceptions of controversy among scientists have been linked to lower levels of engagement and policy support (e.g., Lorenzoni et al., 2007). Consequently, media portrayals of arguments about scientific controversy have

been studied intensively (e.g., Boykoff & Boykoff, 2004; Painter & Ashe, 2012). The absence of controversy, here conceptualised as 'consensus', is also highly relevant: explicit emphasis of scientific consensus on certain key questions about climate change can have substantial effects on audiences, acting as a 'gateway belief' (Kerr & Wilson, 2018; van der Linden et al., 2015). Thus, the mode of presentation (controversy or consensus) is a highly relevant distinguishing feature of different media portrayals of climate change.

Previous cross-national comparative research has conceptualised controversy with relatively little theoretical sophistication and has a strong focus on media portrayals of climate science (rather than policy and societal responses). For example, research has investigated the presence of a "scientific uncertainty" frame (Schäfer & O'Neill, 2017, p. 13) and "sceptic" arguments that questioned the anthropogenic nature of climate change (Painter & Ashe, 2012). Cross-sectional studies were able to show that these were more prominent in the UK and the US, as compared to other countries, e.g., France, India, China, Brazil (Painter & Ashe, 2012), or Germany (Grundmann and Scott, 2014). Recent case studies, on the other hand, use more fine-grained approaches and have deepened scholarly understanding of how the media present controversy about climate change. For instance, Schmid-Petri et al. (2017) show that while still prominent in US media, the nature of scepticism covered has changed from 'trend' and 'attribution' towards 'impact' scepticism. In the German context, Kaiser and Rhomberg (2016) show that media occasionally 'question the doubt' by critically evaluating sceptical arguments.

Concerning the topics covered in the news media, the presentation of climate science is well-researched, but climate change, taken as a whole, is a broad discursive arena, allowing the media to emphasise different themes. Experimental studies have demonstrated the impact these choices have on how audiences respond to climate change messages (e.g., Myers et al., 2012). Thus, both the mode of presentation and thematic emphasis differentiate coverage. Recent comparative research is sensitive to this second dimension of cross-country and between-outlet differentiation. For example, Gurwitt et al. (2017) show that, across the globe, print coverage of the Paris climate conference was 'heavily skewed towards the developed world, with little discussion of the most vulnerable countries or the issues that are important to them' (p. 281). One remarkable insight from the comparative field is a change of reporting during international climate conferences: in contrast to the national differentiation discussed above, coverage of these events is characterised by cross-country convergence (Wessler et al., 2016).

ACTORS MATTER

By using approaches sensitive to thematic emphasis and the mode of presentation, the field has generated valuable insights. However, the role of actors in media portrayals of climate science, policy, and politics is understudied from a comparative perspective. In contrast, the literature on media effects demonstrates that understanding the role of actors is crucial. Recent findings from a range of experimental studies show that audiences are sensitive to 'competitive framing environments' in which they are presented with different options of how to interpret news (Nisbet et al., 2013). This is typically the case in real-life climate change reporting, where coverage involves many actors and their competing views. In order to reduce the 'information costs' of thinking about complex and distant phenomena, such as climate change, individuals often rely on heuristics that help them make sense of news (Rugeley & Gerlach, 2012). The actors and their opinions presented serve as such a heuristic and can have a strong influence on how audiences respond to messages. For example, as Benegal and Scruggs (2018) show, consensus supporting messages by partisan peers have the potential to increase belief in scientific consensus about climate change. In the Australian context, Kousser and Tranter (2018) demonstrate that cues about political leader's positions trigger support or opposition for climate change energy policy among partisan voters. Most of the work in the field has been done in the US, and without a cross-national dimension, but these findings highlight how important individual actor's positions are in shaping audience responses.

National case studies have responded to such insights and started to focus on the actors driving scepticism and uncertainty. They have shown, for example, that 'the vast majority of the uncertainty, controversy, disagreement, and scepticism frames in [US] climate change journalism are not from scientists' but from political actors (Rice et al., 2018, p. 17). Discourse network analysis (Leifeld & Haunss, 2010), has been extensively used to extract climate change policy advocacy networks from newspaper coverage, demonstrating how think tanks and politicians advocate for business interests in Canada (Stoddart et al., 2017). While actor-centric case studies have produced valuable insights into the nature of climate change coverage, their focus on single countries and the diversity of methods employed makes it difficult to compare findings and integrate them in a broader theoretical framework for comparison.

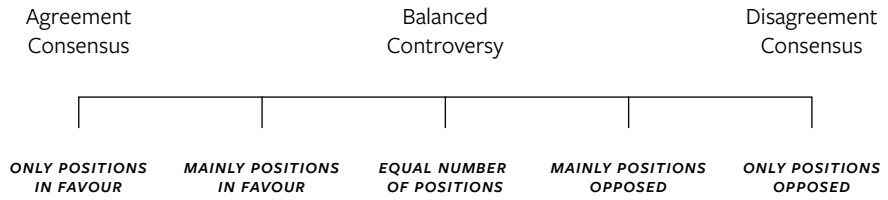
ACTOR-ISSUE-POSITIONS DRIVE CONTROVERSY AND CONSENSUS

The theoretical challenge, then, is to use the existing literature to conceptualise thematic emphasis, the relative proportion of coverage per issue, its mode of presentation, controversy and consensus, and the actors presented in a coherent manner suitable for a comparative study. The most common strategy to study opposition between actors uses the notion of 'conflict frame', defined as news item-level presence of disagreement among actors or the emphasis of multiple sides to a story (Semetko & Valkenburg, 2000) — a concept too coarse to capture the complex interactions between actors presented in most climate change coverage. On the other end of the spectrum, Rice et al. (2018) offer a fine-grained distinction between different types of 'opinion divergence' (p. 5) among individuals, groups, and ideas. This level of detail produces highly valuable insights but is too fine-grained to be used in a comparative setting. Discourse network analysis and its theoretical predecessor claims analysis (see Leifeld & Haunss, 2010) conceptualise relations between actors based on their agreement or disagreement with inductively coded statements and analyse the emergent patterns. The advantage of such an approach is that it enables both issue- and actor-centred analyses.

Building on the latter two approaches but taking a semi-deductive stance, we conceptualise coverage of climate change as the presentation of arguments in favour of or against claims representative for key issues made by different actors. Using these actor-issue-positions (AIPs) as foundation for further theorising, the mode of presentation is best thought of as a position on a scale ranging from agreement consensus over controversy to disagreement consensus emerging from the combination of multiple AIPs (Figure 2.1). The degree of controversy or direction of consensus is thus specific to each issue covered in a news item. For instance, in one item, the actors presented may agree on climate science, while debating the correct policy response. As the default statements are formulated to be in line with the (scientific) consensus position on climate change (see Table 2.3 in the Methods section for details), our conceptualisation links up with existing research. For example, agreement consensus with respect to the anthropogenic nature of climate change represents a 'consensus communication' (e.g., Chinn et al., 2018) pattern, whereas disagreement consensus on the same issue would correspond to a news item presenting only arguments that deny climate science.

Figure 2.1

Consensus-controversy scale



Our approach allows us to investigate the patterns of controversy and consensus found across countries. This term captures the three dimensions analysed in this study in which news coverage can differ between countries: i) thematic emphasis: which issues are presented more prominently than others by devoting a larger share of coverage to them, ii) mode of presentation: which issues are presented as controversial, or as matters of (dis-)agreement consensus, and iii) the actor-issue-positions driving thematic emphasis and mode of presentation. The following research question captures the aim of this study and the theoretical background developed.

> RQ: How do patterns of controversy and consensus about climate change differ between Germany, Canada, and the US?

PATTERNS OF CONTROVERSY AND CONSENSUS ACROSS COUNTRIES

In order to contextualise and explain our country-specific and comparative findings, we build on an extensive body of published research. However, we face two gaps in the literature that we need to address. First, as noted in the theoretical discussion above, only little comparative research studies the positions of actors portrayed in news coverage and the resulting patterns of controversy and consensus beyond climate science. Second, theoretical work that connects such patterns with contextual knowledge concerning political and media systems or cultural factors is sparse. Consequently, neither a data nor theory-driven route to a fully-fledged comparative design are available for strict hypothesis testing. In this study, we thus use extant empirical research to formulate tentative hypotheses and theories from the field of communication science at large to provide a fitting explanation of our findings.

In order to facilitate this strategy, starting from the pool of fossil-fuel dependent countries with international commitments, we choose three cases – the United States, Canada, and Germany – that differ in ways conducive to formulating theory and its integration with existing comparative research. Political and media institutions are part of well-established comparative frameworks, such as media systems theory (Hallin & Mancini, 2004), which suggests selecting cases that differ along these dimensions. We follow Schäfer et al. (2016a, p. 15), in highlighting public values and beliefs on the one hand and journalistic cultures on the other. These macro-level, cultural concepts fit better with the degree of abstraction and generalisation used here than micro-level theories about journalists' behaviour (cf. Esser & Hanitzsch, 2012). We proceed by using findings from national case studies of our countries (and comparative work, if available), that relate to the dimensions of interest to develop hypotheses.

We focus on five issues: the anthropogenic nature of climate change, its impact on humans, the necessity to limit greenhouse gas emissions, the efficacy of different measures, and international climate agreements. While much more fine-grained thematic distinctions are possible (e.g., Rebich-Hespanha et al., 2014), these categories capture well the breadth of topics discussed at a level of abstraction suitable for a comparative study and are covered extensively in the scientific literature. The extant literature indicates that we will find 'disagreement consensus' only very infrequently. Thus, our hypotheses focus on comparing the frequency of controversy across countries, but when discussing our results, we present all three categories.

ANTHROPOGENIC CLIMATE CHANGE

US media have historically overrepresented scientific controversy about the anthropogenic causes of climate change (Boykoff & Boykoff, 2004) but recent research reveals that 'sceptic' arguments in the media have shifted towards the impact of climate change (Schmid-Petri et al., 2017). What drives this shift – a decline in the journalistic norm of balance, as argued by Boykoff (2007), or other dynamics – is not fully understood in the field. Neither Canadian nor German media have an established record for presenting such sceptical arguments and we expect this issue to be covered similarly across countries.

> H1: Similar levels of coverage (H1a) concerning 'anthropogenic climate change' can be found across countries. Likewise, the issue is presented as controversial with similar frequencies across countries (H1b).

IMPACT ON HUMANS

The turn to 'impact scepticism' (Schmid-Petri et al., 2017) in US media appears to be primarily driven by portrayals of politicians' dissent (Rice et al., 2018). Neither conservative nor liberal German media seem to report frequently on this type of scepticism (Schmid-Petri, 2015) and when they do so, it appears to often involve critical evaluation of foreign (chiefly US) political actors' sceptical arguments (Kaiser & Rhomberg, 2015). This may be the outcome of public and political consensus that treats this aspect of climate science as relatively settled (Hake et al., 2015; Metag et al., 2015). In Canada, public perception is a bit more doubtful in some regions (Mildenberger et al., 2016) but the public appears less fundamentally divided than in the US. Taken together with higher levels of climate change scepticism in the US found across the literature (e.g., Painter & Ashe, 2012), these tendencies suggest the following hypotheses.

> H2: In comparison to the other countries, 'impacts on humans' has the highest level of coverage (H2a) and is most often presented as controversy (H2b) in the US.
>
> H3: Political actors' positions on 'impacts on humans' are more often presented in the US than in Canada and Germany.

LIMITING GREENHOUSE GAS EMISSIONS

Germany is often portrayed as one of the global leaders in efforts to mitigate climate change, mainly due to its ambitious 'Energiewende' policy (usually referred to as 'energy transition'). The overall goals of this policy are at large supported throughout the multipolar party system (Renn & Marshall, 2016); divisions mostly concern the measures perceived as necessary or feasible to obtain them. Consequently, a majority of the public supports continued implementation of the policy (Sonnberger & Ruddat, 2016). In contrast, the US is characterised by a high degree of politicisation and polarisation; opinions about climate change-related issues are separated into two camps, which largely overlap with the two major parties (Hopkins & Markowitz, 2017, p. 10), often sparking public controversy. In Canada, climate change politics has seen some historical back-and-forth but currently, the government under the leadership of prime minister Justin Trudeau pursues an ostensibly climate-friendly agenda. On average, the population is concerned about climate change and in favour of national policies addressing the issue (Mildenberger et al., 2016) but not at a level similar to Germany.

> H4: In Germany, media devote more coverage to 'limiting emissions' (H4a) and present it less often as controversial (H4b) than in the other two countries.

While political actors are likely to dominate media portrayals of discussions about the need to limit emissions in all countries, other actors participate. Building on a historically activist stance (Weingart et al., 2000), German media have been shown to explicitly and critically comment on climate science-sceptics' positions (Kaiser & Rhomberg, 2016) and we expect a similar pattern in the discussion about the need to limit emissions.

> H5: Media actors' positions on 'limit emissions' are more often presented in Germany than in the other two countries.

Likewise, German scientists do actively engage with national media, the public, and political institutions through communicative efforts (Schäfer et al., 2016b, p. 10), and frequently comment on the necessity to limit emissions (Rhomberg & Kaiser, 2015, p. 35).

> H6: Scientists' positions on 'limit emissions' are more often presented in Germany than in the other two countries.

In Canada, as Stoddart et al. (2017) show, fossil fuels are an important issue of contention, but this does not appear to correspond to a high level of media presence of corporations involved in the sector. According to the authors, government representatives at different levels (sometimes promoting fossil fuel industry arguments) and environmental activists are most visible in the media.

> H7: Business actors' positions on 'limit emissions' are less often presented in Canada than in the other two countries.

EFFICACY

As mentioned, German politics has to a large extent moved past discussing climate change policy goals, the focus now mainly lies on the policy measures and individual efforts needed to obtain them – questions of efficacy. According to Ivanova (as cited in Schäfer et al., 2016a, p. 15), portrayals of this issue are more frequent in Germany than elsewhere. Also, Hart and Feldman (2014) found that efficacy messages are relatively infrequent in US media. The role of efficacy messages in news coverage has not been studied in Canada and no specific hypothesis is formulated for the country.

H8: German media devote more coverage to 'efficacy' than their counterparts in the US.

INTERNATIONAL AGREEMENTS

International agreements and negotiations are frequently and similarly covered in different countries (Wessler et al., 2016). Ancillary to this study, this issue will not be discussed in great detail if the following hypothesis holds.

H9: Similar levels of coverage (H9a) and modes of presentation (H9b) can be found across countries concerning 'international agreements'.

METHODS AND MEASURES

AUDIENCE-DRIVEN SAMPLING

Any study of news coverage trying to generalise to a national level faces the challenge that drawing representative samples of all news production is practically impossible. Typically, the way out of this dilemma is to focus on a theoretically identified type of media, such as 'broadsheet' national newspapers, the 'prestige press', 'business and financial news' and selecting the biggest or most prominent outlets from the category. Another approach uses expert-established political leanings of news outlets to sample from sources across the political spectrum. In this study, we have taken inspiration from these practices but used a slightly different and novel approach to select news sources.

Majorities in the selected countries use online news sites, which have a wider reach than print media and have surpassed that of TV in Canada and the US (Newman et al., 2017, pp. 70, 103, 109). Using representative survey data from the Reuters Digital News Report (Newman et al., 2017), we selected online media outlets that reflect preferences across political audience segments and include business-oriented publications and national broadcasters (if possible). In the case of Canada, the most prominent left- and right-leaning French-language outlets were also included. Table 2.1 presents the outlets selected, the percentage of the population who name it as a source of news used last week (multiple mentions possible) and a description of the position in the national spectrum of online media outlets – based on the average political orientation of the outlet's audience on a left-right scale reported in the same survey.

Table 2.1

News outlets selected for analysis

Country	Outlet	Weekly Consumers	Position
United States	npr.org	9.8%	Public Broadcaster, far left
	huffingtonpost.com	24.4%	Left
	cnn.com	21.8%	Centre-left
	wsj.com	9%	Business, Centre-right
	fox.com	19.9%	Far right
Canada	huffingtonpost.ca	19.4%	Left
	lapresse.ca	5.6%	French-language, centre-left
	cbc.ca	21.3%	Public broadcaster, centre
	ctv.ca	16.6%	Centre-right
	tva.ca	7.2%	French-language, right
Germany	sueddeutsche.de	6.6%	Left
	tagesschau.de	13.2%	Public broadcaster, centre-left
	spiegel.de	14.8%	Centre
	handelsblatt.com	3.3%	Business, centre-right
	focus.de	12.5%	Right

As previous research has shown, national or international events, such as the regular Conference of the Parties (COP) are associated with heightened media attention to climate change (Schäfer et al., 2013), making them a common object of study. However, previous studies suggest that conferences are covered differently from regular reporting – more focused on the individuals and groups attending the event and its proceedings and more similar across countries (Wessler et al., 2016; Gurwitt et al., 2017). Thus, to focus on only conference coverage would understate cross-national differences, while excluding it would overestimate them. Given that this study aimed to provide a broad picture of differences and similarities of national coverage (which includes reporting on international events in regular intervals), a middle ground was most appropriate. Consequently, we collected articles published in the period three months before, during, and three months after COP 23, the longest time frame around the conference possible within the context of this study.

Most databases include only a limited collection of online media, and few outlets provide a searchable archive, which means that articles have to be sampled using different means. We collected articles using a novel procedure developed to study online news coverage. Our corpus was built from the results of daily searches of each outlet's website for a range of keywords (e.g., 'climate change', 'fossil fuels', 'carbon dioxide') using a Google Custom Search Engine. This technique is in principle prone to sampling biases introduced by the unknown search algorithms. However, our manual inspections of the sample found the procedure to be highly inclusive but also yielding a large share of irrelevant articles, which were manually excluded during the analysis. The full corpus of search results (N=13,149) was used to draw a sample for analysis, which also yielded articles used during coder training and a second, smaller sub-sample for reliability pre-testing (n = 24). The sample was drawn using disproportionate stratified random sampling, in order to obtain a considerable amount of relevant articles from each of the five outlets and three time periods (before, during, and after COP 23). This resulted in 15 strata per country. When the number of articles identified as relevant in a stratum turned out to be too low, additional articles were sampled for that stratum. Ultimately, 364 relevant articles were analysed in-depth during the coding stage. While this number may appear low at first sight (~8 per strata), it is important to keep in mind that the goal of the analysis is not to compare outlets or time periods across strata but to aggregate at the national level. Furthermore, the main units of analysis are the actor-issue-positions and issue discussions, which have much higher case numbers (see the following section).

CODING ACTOR-ISSUE-POSITIONS

Building on the theoretical approach discussed earlier, the following coding procedure was developed and used by a team of three coders. We first checked for relevance, based on whether at least one actor-issue-position for one of our issues of interest could be found in the article but did not distinguish further between genres (op-ed, news, interview, ...). We then identified the six most prominent issues and the six most pertinent actors portrayed to have a position on agreement or disagreement with a key claim representative of the issue or a more specific statement that would still support the main claim (see Table 2.3). For each of the actors identified to have a position, we also coded an actor category (codebook available upon request). This procedure resulted in 2042 actor-issue-positions, across 902 issue-discussions, the main unit of analysis, distributed over 364 articles.

Table 2.2

Reliability measures

Variable	Scope	N	Description	alpha
relevant	article	24	The article is relevant for the analysis	0.83
actor category	actor	66	The actor's category (see theory)	0.84
agreement	actor-issue-position	39	The actor agrees with the affirmative statement or a more specific statement	1

Multiple rounds of training and pre-testing resulted in the inter-coder reliability scores reported in Table 2.2 and 2.3, measured using Krippendorf's alpha (Hayes & Krippendorff, 2007). The ultimate units for analysis, the issues raised in each article and the actor-issue-positions are coded inductively and consist of relational data, which creates a challenge when assessing reliability (cf. Muller, 2015). Put briefly, it is impossible to do classical inter-coder-reliability analysis for actor-issue positions, as an exhaustive list of possible actors cannot be given beforehand. Additionally, most actors (and consequently AIPs) are not present in a given article, due to the sheer number of them, which would invalidate attempts at assessing ICR at this level. Thus, in this study, we re-coded our relational data and used proxy units to give the best possible assessment of inter-coder reliability. First, for each issue category used, we calculated an article-level dummy variable indicating the issue's presence; Table 2.2 presents the ICR results for each of the dummies (n=19). The issues 'limit emissions' and 'efficacy' have relatively low reliability, which means that these issues were not always correctly identified (see discussion of limitations below). Second, for each actor coded by all coders, we checked the reliability of the assigned category (Table 2.3). Third, for each actor coded by all coders to have a position on the same issue, we checked reliability for the agreement with the default statement (Table 1.3).

Table 2.3

Issue descriptions and Reliability

Issue	Name	Affirmative Statement	alpha
1	anthropogenic climate change	climate change is human-made	0.84
2	impact on humans	climate change has an impact on humans (health, economy, security, etc.)	0.78
3	limit emissions	greenhouse gas emissions need to be reduced	0.55

4	efficacy	efforts to mitigate climate change can be successful	0.63
5	international agreements	a response to climate change should be found through international agreements	0.85

ANALYSING PATTERNS OF CONTROVERSY

Since the actual number of relevant articles per national strata were unknown, an estimate based on our categorisation was used to calculate per-strata sampling probabilities and national design weights to counteract design effects (Tracy & Carkin, 2011). These were then scaled to the estimated national population sizes to enable cross-national comparisons and significance tests (Kaminska & Lynn, 2016) and applied in all subsequent analyses. While this procedure cannot yield estimates representative for the entire national landscape of media reporting, it ensures that the findings are approximately representative of the news output of the outlets analysed.

Next, the actor-issue-positions identified during coding were used to classify each mention of an issue according to three categories – representing agreement consensus, controversy or disagreement consensus, as discussed earlier, with one simplification: to ease analysis, we do not measure controversy on a scale, but treat all instances that do not fall into the (dis-)agreement consensus categories as 'controversy'. The following measures were calculated for each country and subsequently compared: i) the proportion of issue discussions for each issue category (operationalising the level of coverage/ thematic emphasis), ii) the issue-specific shares of agreement/disagreement consensus and controversy (mode of presentation), and iii) the percentage of issue-discussion mentioning each actor category under scrutiny. In order to account for the sampling design – design weights and finite population corrections – the R package 'survey' (Lumley, 2004) was used for all aggregations and comparisons. For each variable of interest, we test for cross-country differences by first using a χ 2 -test for independence, followed by Bonferroni-corrected pairwise t-tests (Hayes, 2009, pp. 368–369), if warranted. Confidence intervals presented in the graphs are estimated by fitting a logistic regression model, estimating a Wald-type interval and transforming to the probability scale. For most issues, differences between actor contributions to the mode of presentation (i.e., who disagrees and who agrees with the key claim) could not be tested across countries, due to media in one or two countries covering the issue

so infrequently that case numbers are too low for reliable significance tests of AIP differences. In this scenario, we present intra-country χ 2 -tests of independence to compare actor categories within the countries of interest.

EMPIRICAL RESULTS

In this section, we present empirical results obtained from analysing actor-issue-positions in climate change news. For each of the issues discussed earlier, we present levels of coverage, the shares of issue-discussions classified as controversy and consensus, and an analysis of the actors driving these patterns. Where appropriate, we present significance tests and refer back to the corresponding theoretical hypotheses (summarised in Table 2.4). In addition, for each issue, we append a short illustration of the coverage captured by the patterns described; these descriptions provide qualitative context needed for the discussion of our results in the following section. To give an overview, Figure 2.2 presents issue coverage across the three countries. The omnibus test reveals a significant association between the country variable and observed issue categories ($\chi 2(10) = 111.77$, $p < .001$).

Figure 2.2

Proportion of issue-discussions per category and country

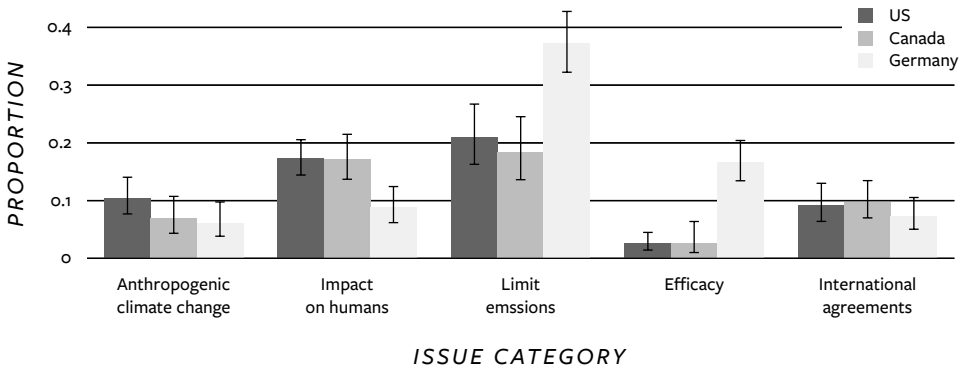


Table 2.5

Hypotheses and findings

Hypothesis	Result	Remarks
H1: Similar levels of coverage (H1a) concerning 'anthropogenic climate change' can be found across countries. Likewise, the issue is presented as controversial with similar frequencies across countries (H1b).	Yes / Yes	
H2: In comparison, 'impacts on humans' has the highest level of coverage (H2a) and is most often presented as controversy (H2b) in the US.	No / Yes	Similar levels of coverage in Canada and the US
H3: Political actors' positions on 'impacts on humans' are more often presented in the US than in Canada and Germany.	No	Same level in the US and Canada. US political actors drive controversy, Canadians consensus
H4: In Germany, media devote more coverage to 'limiting emissions' (H4a) and present it less often as controversial (H4b) than in the other two countries.	Yes / No	Similar levels of controversy in Canada and Germany
H5: Media actor' positions on 'limit emissions' are more often presented in Germany than in the other two countries.	No	No difference between countries
H6: Scientists' positions on 'limit emissions' are more often presented in Germany than in the other two countries.	No	In the US, media actors play a larger role than in Germany
H7: Business actors' positions on 'limit emissions' are less often presented in Canada than in the other two countries.	No	Similar levels of involvement for US and Canadian market actors
H8: German media devote more coverage to 'efficacy' than their counterparts in the US.	Yes	
H9: Similar levels of coverage (H9a) and modes of presentation (H9b) can be found across countries concerning 'international agreements'.	Yes	

Table 2.4

Significance tests for planned comparisons

Issue	Measure	Overall	US-CA	US-DE	DE-CA
Anthropogenic Climate Change	Share	$\chi^2(2) = 4.38$	—	—	—
	Controversy	$\chi^2(2) = 4.38$	—	—	—
Impact on Humans	Share	$\chi^2(2) = 10.74$ **	$t(218) = 0.02$	$t(204) = 3.86$ **	$t(213) = 3.37$ **
	Controversy	$\chi^2(2) = 7.39$[a]	$t(78) = 2.50$ **	$t(48) = -1.67$	$t(53) = 0.55$
	AIP (political)	$\chi^2(2) = 2.30$	—	—	—
Limit Emissions	Share	$\chi^2(2) = 31.41$ **	$t(218) = 0.68$	$t(204) = 4.36$ **	$t(213) = 4.93$ **
	Controversy	$\chi^2(2) = 25.55$ **	$t(84) = -2.90$ **	$t(108) = -4.78$ **	$t(95) = -1.21$
	AIP(science)	$\chi^2(2) = 1.59$	—	—	—
	AIP (media)	$\chi^2(2) = 15.05$ *	—	—	—
	AIP (market)	$\chi^2(2) = 27.47$ **	$t(84) = 0.82$	$t(108) = 2.55$ **	$t(95) = 3.34$ **
Efficacy	Share	$\chi^2(2) = 59.36$ **	$t(218) = 0.00$	$t(204) = 7.04$ **	$t(213) = 6.62$ **
	Controversy	$\chi^2(2) = 4.97$	—	—	—
	AIP	—	—	—	—
International Agreements	Share	$\chi^2(2) = 1.13$	—	—	—
	Controversy	$\chi^2(2) = 1.84$	—	—	—

** Bonferroni-corrected p<.05; * Bonferroni-corrected p<.1; [a] Bonferroni-corrected p=0.103

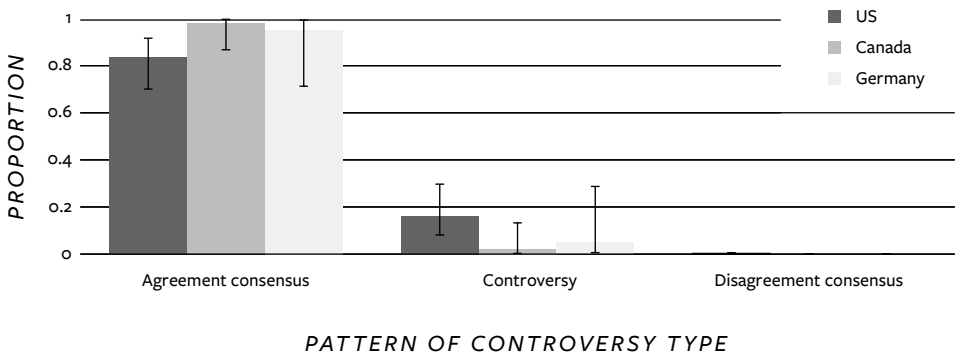
ANTHROPOGENIC CLIMATE CHANGE

The question of whether climate change is human-made is covered relatively infrequently in the three countries studied here. The point estimate is slightly higher for the US: 11% as compared to 7% in Canada and 6% in Germany. However, these differences are not significant (see Table 2.4). Likewise, the estimated share of this issue presented as controversy is higher in the US but given the low amount of coverage (esp. in the other two countries), these differences are non-significant as well. These results corroborate hypothesis 1: indeed, media in all countries seem to have largely parted with presenting (scientific or political) controversy concerning the anthropogenic nature of climate change.

IMPACT ON HUMANS

The next issue of interest, 'impact on humans', is discussed significantly less often in Germany (9%) than in the US (17%) and Canada (17%), while there is no significant difference between the latter two. Nonetheless, taking a closer look at the patterns of controversy, the US and Canada differ in two aspects. First, although US media do not devote more space to the issue than their Canadian neighbours, in the US, the issue is covered significantly more often as controversy (Figure 2.3), which corroborates hypothesis 2 in part. Second, counter to expectation, fewer actor-issue-positions concerning this issue are attributed to political actors in the US (21%) compared to Germany (32%) and Canada (28%). While this difference is non-significant, it constitutes evidence counter to hypothesis 3.

Figure 2.3
Proportion of pattern of controversy types per country for the 'impact on humans' issue



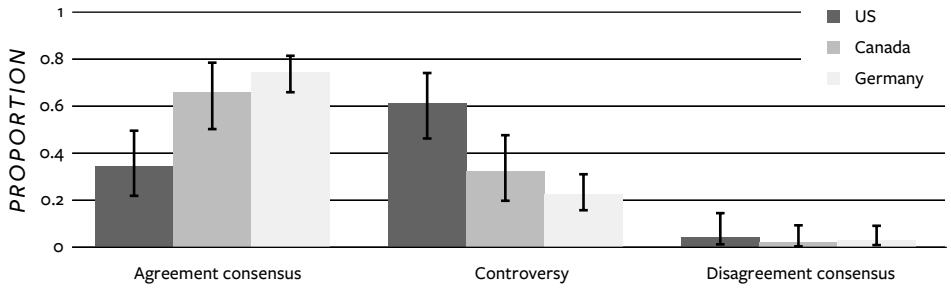
While political actors appear similarly often, they contribute very differently to the public discussion across countries, as revealed by within-country tests. In the US, 26.1% of political actors' AIPs presented disagree with the default claim, comparing to 3.9% for all other actor categories ($\chi^2(1) = 10.73$, $p = .003$). In contrast, political actors' proportion of disagreeing statements on the issue is neither significantly different from those of other actor categories in Canada (4% compared to 0%, ($\chi^2(1) = 3.44$, $p > .05$) nor Germany (0% compared to 4%, $\chi^2(1) = 3.44$, $p > .05$). To summarise, despite inconclusive evidence concerning differences in how frequently political actors are portrayed across countries, in the US, such portrayals lead to a considerable amount of controversy about whether or not climate change has significant impacts on humans.

What types of discussions result in these quantitatively observed patterns? In the US, President Donald Trump's nominations for a range of environment-related governmental functions received ample coverage. Often, his candidates held sceptical stances on climate change, sparking controversy with other politicians and environmental activists. As in the other countries, the cases of agreement consensus usually appeared in reports on scientific conferences or publications. In Canada, coverage of political actors focused on prime minister Justin Trudeau's portrayed international leadership and on politicians' responses to reports on economic repercussions of climate change across the country. In this coverage, potential controversies (about policy, see the following issue), is typically paired with a political recognition of the impact of climate change on humans, resulting in the pattern described here.

LIMIT EMISSIONS

German media devote significantly more space to discussing whether or not to limit emissions (37% of issue discussions), corroborating hypothesis 4a, but the difference in media attention between the US (21%) and Canada (18%) is not significant. However, the issue is presented with significantly more controversy in the US (61%) compared to either of the other two countries (Figure 2.4), with no significant difference between Germany (23%) and Canada (32%). Thus, hypothesis 4b is rejected in part: German media present the issue of limiting emissions less often as controversy than US media (but not less often than Canadian media).

Figure 2.4
Proportions of patterns of controversy types per country for the 'limit emissions' issue



Against expectation, there are no significant differences between the levels of scientists' involvement across countries (US: 22%, Canada: 10%, Germany: 15%), rejecting hypothesis 5. The test for association shows a marginally significant difference for media actors, but given the rare occurrence of media actors' positions, the pairwise comparison yields no significant result. Last but not least, taking a look at market actors, Germany drives the significant inter-country differences. There, 14% of actor-issue-positions are attributed to market actors, compared to 2% in the US and 4% in Canada, the difference between the latter being insignificant. Hypothesis 7 is rejected: market actors are not less present in Canadian news than in the US. Additional in-depth tests reveal marginally significant inter-country differences concerning political actors ($\chi^2(2) = 25.81$, $p<.05$) and activists ($\chi^2(2) = 15.79$, $p < .1$). These are driven by lower shares of activists in Germany (4%), compared to the US (15%, $t(108) = 2.29$, $p < .1$)and higher shares of political actors in Canada (60%) compared to 43% in Germany ($t (92) = 2.10$, $p < .1$) and 36% in the US ($t(80) = 2.47$, $p < .05$).

Taking an in-depth look at the articles discussing whether or not to limit emissions, the following features stand out. In the US, the high levels of controversy surrounding policy stem mainly from reports on the Trump administration's declared intention to repeal Obama-era policies, such as the Clean Power Plan. These arguments can play out in drastic terms, such as claims to end a purported 'war on coal'. In addition, the numerous op-eds discussing climate change policy typically present 'both sides' – positions in favour of and opposed to policy. Part of the Canadian coverage is on US politicians' opinions, but the larger share of reports concerns intra-country disagreements between individual politicians, parties, and

regional governments. However, these controversies tend to focus on specific policies and are cast less frequently in fundamental terms than in the US, where the question of policy intervention is often framed as a matter of principle. In Germany, discussions about policy measures are usually cast as questions of how much political intervention is required and possible (see 'Efficacy', just below). Often, these questions are preceded by re-iterating commitments towards goals or demanding further policy measures, for example by business owners who demand a clear regulatory framework.

EFFICACY

When discussing whether certain efforts to limit emissions (by government policy or based on private initiative) should be implemented or pursued, the argument can also be framed in terms of 'efficacy' – the question of whether a specific response will lead to desirable effects or not. At the most fundamental level, this issue is transformed into a question concerning anthropogenic nature of climate change. When the issue at stake flips to doubting whether any climate goals can be obtained by human activities or them being entirely out of reach (in which case it would have been coded as 'anthropogenic climate change' and not as 'efficacy'). As expected, and in line with the other findings, German news media devote significantly more coverage (17%) to these questions than their Canadian (3%) or US (3%) counterparts, corroborating hypothesis 8.

The rare occurrence of this issue in the latter two countries prohibits more detailed comparison of issue-specific patterns of controversy but taking a closer look at the German case reveals an interesting pattern. The issue is presented as agreement consensus in 42% of cases, controversy in 24% and disagreement consensus in 33%. This pattern originates primarily in frequent coverage of a two-sided argument about whether or not specific measures (most notably abandoning coal within the next few years) are needed to achieve the goals of the energy transition ('Energiewende'). In this context, the disagreement consensus pattern is typically used to argue for more far-reaching policies, by stating that current policy is inadequate. The discussion surrounding Germany's decision not to join an international anti-coal coalition advocated for by Canada and the UK further spurred discussion of this issue.

INTERNATIONAL AGREEMENTS

The issue of international agreements played a minor role in all three countries: 9% of US, 9% of Canadian, and 7% of German coverage was devoted to the issue, the differences being insignificant. Likewise, there is no significant association between countries and the levels of controversy and consensus observed. These results corroborate hypothesis 9 in full. The patterns observed are driven by Donald's Trump decision to withdraw the US from the Paris Agreement, Germany's sceptical stance towards the anti-coal coalition and the fact that COP 23 in Bonn spurred discussions about international agreements.

DISCUSSION

Recent case studies of climate change coverage have begun to use actor-sensitive designs, yielding insights at a higher level of detail than previously possible. This study aimed to complement country-specific research by developing an actor-centred approach suitable for quantitative comparative research. Making actor-issue-positions the core theoretical concept, the study was able to show how differently German, Canadian, and US media portray scientists, market actors, environmental activists, and political actors and their positions on issues related to climate change. The findings just presented, and summarised in Table 2.5, show distinct patterns of controversy and consensus. In Germany and Canada, the studied media outlets emphasise political and scientific (agreement) consensus that climate change will have an impact on humans. In contrast, in the US, portrayals of some political actors' disagreement create noteworthy levels of controversy surrounding this issue, but few articles fall in the disagreement consensus category. Similarly, in the US, the media frequently present controversy concerning the need to limit emissions, whereas the issue is predominantly seen as a matter of agreement consensus in Canada and Germany. In the latter case, this provides the basis for a controversial, yet inclusive discussion concerning the efficacy of specific measures, the only issue and country where disagreement consensus was a common occurrence. This issue is rarely raised in US or Canadian media outlets. As conflict and controversy can engage and mobilise audiences (Schuck et al., 2016), the patterns described here have some wider implications for climate change communication practitioners and researchers. Before discussing these, we consider some possible explanations of our findings.

POLITICS DRIVE COVERAGE?

In our view, two sets of factors influence most strongly how the media report on climate change in a specific country: i) the political system and public opinion, generating political events and accessible background information to report on and ii) journalistic culture and norms shaping how such inputs are transformed into media coverage. While all three countries studied here are among the top emitters of greenhouse gases and face strong international pressure to limit their emissions, the politics of climate change and the associated public discussions have evolved quite differently. In Germany, national climate and energy policy builds on the energy transition ('Energiewende'), initiated in the early 2000s by a coalition government between the Social Democrats and the Green party (Hake et al., 2015). The policy fits with the German corporatist approach to economic policy, where regulation of key industries and markets is commonplace and publicly legitimate – in fact, 60% of the population support the energy transition and oppose slowing down the subsidised expansion of the renewable energy sector (Sonnberger & Ruddat, 2016). German political and public discourse for a large part has taken the overarching goals of this policy as given and moved on to discuss how to achieve the country's ambitious emission reduction agenda. Many concrete policy measures, such as shutting down coal-fired power plants, face opposition from business interests and parties (including the Social Democrats) when they see their constituencies at a disadvantage. However, the Greens, together with their activist support base, keep pushing for far-reaching policies generating a lively political discussion – and media portrayals seem to correspond quite well to these political and social trends.

In the US, in contrast, climate policy positions at the national level are increasingly aligned with the existing two-party polarisation. While a majority of the population believes in climate change and supports policy to mitigate the problem, public perceptions and attitudes are sharply differentiated according to party affiliation (Leiserowitz et al., 2018). This extends deep into attitudes relevant to climate change politics: trust in environmental impact science (McCright et al., 2013), attitudes towards the government and corporations (cf. Pechar et al., 2018), and pro-environmental values pertinent to the issue (Lucas, 2018). Given that these differences align with other political cleavages, the winner-takes-all electoral system leads to more polarised political positions by vocal partisans and prevents the formation of a party catering to voters that care strongly about environmental issues. The patterns of media coverage observed foreground fundamental political controversy about the need to limit emissions, to the detriment of voices discussing policy options and private or sub-national efforts to address climate change.

Canada experienced some political polarisation surrounding climate change – as evidenced by political back-and-forth concerning international agreements. The country's withdrawal from the Kyoto Protocol in 2011, under a Conservative Party-led government, is contrasted by the current administration, which pursues an ostensibly climate friendly agenda, both at a national and international level. Overall, a majority of the population supports this position, but there is considerable regional variation (Mildenberger et al., 2016), which continues to create tensions and disputes about energy and environmental policies, in particular when linked to the fossil fuel extraction sector. Whether or not the current political state of affairs concerning climate change is indicative of a long-term trend, or another swing of the pendulum is to be seen. Despite many cleavages and conflicts that could be highlighted by Canadian media, the overall emphasis lies on consensus rather than controversy – in stark contrast to the US. Political and media system factors would put the country closer to the US than Germany (Hallin & Mancini, 2004), but the observed patterns of controversy and consensus point to the opposite. Journalistic norms and routines are well-suited to add nuance to these system level variables and explain our findings.

SELECTIVE INDEXING AND INTERPRETATION

Political dynamics and public attitudes are important factors explaining climate change coverage, but ultimately, journalists and media organisations make the news. In the US, previous research has identified a shift in media presentations of trend and attribution to impact scepticism (Schmid-Petri et al., 2017). Our results are in line with such findings and add evidence to the notion that portrayals of climate change controversy are 'frequent but accurate' (Rice et al., 2018), by being correctly attributed to mostly political actors. This observation adds evidence to the hypothesis suggested by Schmid-Petri et al. (2017) that 'indexing' politically relevant opinions (Bennett, 1996) drives news coverage of climate change in the US. According to this hypothesis, journalists may try to assess an issue's relevance or boost its newsworthiness by providing an index of what they deem the most relevant political opinions. In our material, for example, many articles that primarily focused on new scientific findings were given context by citing a recent denialist statement by President Trump. We find similar patterns in Germany and Canada, where political actors also receive ample attention – however with less focus on voices denying climate change's impact on humans, such as Trumps' nominees, the AfD in Germany, and regional contrarians in Canada.

Our results also add support to Brüggemann and Engesser's (2017) findings that the norm of balance is being replaced by 'interpretative reporting': journalists contextualise and explain the positions of the actors they cover. In our data, political statements are often contrasted with the scientific consensus position. This is achieved by citing another political actor (and sometimes scientists), or direct journalistic intervention that makes the author's position on the issue apparent (cf. Bartholomé et al., 2015). In the German case, this has been previously described as journalists 'questioning the doubt' (Kaiser and Rhomberg, 2016, p. 556) and commenting critically on climate change denialist arguments. In some sense, this is still indexing behaviour. However, our findings suggest that German news media, compared to their North American counterparts, increasingly ignore (political) contestation of the scientific evidence of climate change and instead portray societal and political discussions of the best strategies to achieve mitigation goals – still following an indexing logic but with a different emphasis.

Indexing, interpretation, and contextualisation may result in accurate pictures of the political landscape and of recent climate science findings. Yet, these norms aren't determinate, and leave room for giving emphasis to select opinions and ignoring others. In the US, the media noticeably foreground political controversy, which results in marginalising voices seeking to shift the public discussion towards finding workable solutions. These trends are in line with US media's widely discussed emphasis on 'game' aspects of politics (Aalberg et al., 2012), personalisation (Van Aelst et al., 2012), and polarisation (McCluskey & Kim, 2012), rather than policy, sometimes captured under the notion of 'media logic' (cf. Brants & van Praag, 2017). In contrast to the US, German media emphasise a comprehensive solution-oriented public discussion. Canada is situated in the middle of these two poles: while the media tend to focus on political actors, they emphasise agreements between them, more so than in the US. To sum up, indexing appears to be an essential factor in all countries alike, but the overlap with other norms drives which actors and which of their statements are selected to give context and build a story.

LIMITATIONS

In many respects, our findings fall in line with and complement existing research on climate change coverage in the three countries. Nonetheless, generalisation from the findings presented here should be done with care and acknowledging the limitations of this study. First, public discussions in the three countries during the period of investigation were driven by idiosyncratic national events and topics (such as political nominations and discussions surrounding specific national policies)

and thus differ strongly. This is an interesting finding and should not be ignored, especially given that coverage of an international climate conference was part of the sample, which has been previously shown to lead to convergence. However, differences may be emphasised by a relatively short sampling frame (6.5 months). In order to evaluate the effect of specific circumstances, a study using the same or similar methodology but over a longer time frame would be needed. This could also remedy the low case numbers in select countries on specific issues, preventing statistical comparison of relevant actor-issue-positions.

Second, in this study, we chose to focus on online coverage, and we selected outlets with great care to obtain the best approximation of a nationally representative sample by focusing on widely-read outlets across the political spectrum. Nonetheless, any selection of online outlets will always present a minority of what is available for audiences. While we have chosen to generalise to the national level, the specifics of the sample should be kept in mind. Third, the data collection and sampling method, while briefly manually validated, would deserve a more formal investigation and comparison with other data sources and strategies. In addition, the impact of estimating design weights on confidence intervals and significance tests needs further discussion. Fourth, the reliability scores reported are mediocre in some cases. Considering that coders analysed mainly different country data, this potentially influences the results presented here. However, most findings are based on variables with acceptable scores and the first author coded data from the US and Germany, making it unlikely that the impact was systematic. The results are also validated by comparison with the existing country-specific literature, which strengthens our confidence in our findings.

CONCLUDING REMARKS

While these limitations require the results to be treated with care, the findings of this study have some wider implications for climate change communication research and practice. To begin with, they provide evidence against the notion that climate change coverage is becoming more homogenous across the globe. On the one hand, COP 23 and US President Donald Trump's decision to intend withdrawal from the Paris Agreement received similar coverage across countries (cf. Wessler et al., 2016). On the other hand, countries differed remarkably with respect to issue

emphasis, mode of representation and the actors presented. This supports Schäfer et al.'s (2011) diagnosis that climate change is not discussed in a global public sphere but differentiated national ones.

The emphasis of political actor's positions is in line with what Schmid-Petri et al. (2017) call the 'large issue cycle of climate change' and the overall shift towards politics. However, in the US case, it does not follow Downs (1972) or Habermas (2006) idealised models of a public discussion that moves from problem identification to finding a solution, since the observed patterns seem to reinforce political division, rather than solution-finding. There is increasing experimental evidence that political identity cues may be important triggers of motivated reasoning (Benegal & Scruggs, 2018; see also McLaughlin et al., 2016), which indicates that the focus on political actor's positions furthers existing polarisation concerning the issue, in particular in the US.

How audiences react to political actors' positions on climate change is only partly understood. Given the frequency with which they are being portrayed as the drivers of controversy, this is a potentially highly relevant avenue for further studies. For example, media attention to political actors and motivated reasoning could reconcile findings of 'reinforcing spirals' (Feldman et al., 2014) – linking conservative media use to declining belief in global warming and vice-versa – with the absence of political parallelism in US media (Schmid-Petri et al., 2017). When audiences are cued into motivated reasoning, for instance by portrayals of political actors' positions or the presence of climate change (Feldman & Hart, 2018), they tend to respond by reinforcing existing attitudes in the light of new information (Hart et al., 2015; Hart & Nisbet, 2012). Thus, rather than a result of media bias, declining beliefs among US Republicans may be an incidental outcome of exposure to political positions concerning climate change, which are widespread across media outlets due to the journalistic norms and routines discussed.

Taken together, these conclusions imply that journalists and campaigners should be careful when selecting a focus for their messaging efforts – emphasising bipolar conflict and controversy concerning fundamental policy (and science) questions side-lines those concerning feasibility and efficacy that more societal actors have a stake in. For example, devoting coverage to the denialist positions of some politicians, while potentially mobilising those already supportive of mitigation policies, reinforces the politicisation of facts otherwise supported by a scientific consensus. It also foregoes the opportunity to discuss different strategies for limiting emissions put forward by scientists, businesses, and activists. Similarly, when presenting

relevant positions on climate change policy, practitioners should pay more attention to non-political actors. Presenting their views may contribute to directing attention away from the impression that the issue can be reduced to only two sides in favour and opposed to policy intervention.

As a final note, our findings suggest a middle ground in the discussion about (de-) politicising climate change (e.g., Corry & Jørgensen, 2015; Pepermans & Maeseele, 2016). Our results point to a need for a differentiated (de-)politicisation as the path forward. Some scientific insights, such as the impact of climate change on humans, broadly speaking, need defence against becoming the object of political controversy, while discussions of the path forward involve difficult questions concerning many that deserve more media coverage and space in the public sphere. In addition, the results presented here suggest that the role and effects of political actors in climate change news need both further studies and more careful treatment by communication practitioners. In combination, such efforts may contribute to a better understanding of how to make current patterns of media portrayals more inclusive and directed towards critically evaluating different mitigation and adaption policies.

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DATA STATEMENT

The raw data used for this research contains information about identifiable natural persons, according to EU General Data Protection Regulation definitions, and cannot be shared. An anonymized aggregate dataset can be made available upon request. The research procedure presented in this article was approved by the Ethics Review Board at the Faculty of Social and Behavioral Sciences, University of Amsterdam; Amsterdam, The Netherlands (ID 2019-PCJ-10143).

DECLARATION OF COMPETING INTEREST

The authors declare no conflicting interests.

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chapter 3

polarisation vs consensus-building: how US and German news media portray climate change as a feature of political identities

ABSTRACT

Perceptions of climate politics often align with individual political leaning and associated media consumption patterns, pointing to a need for a fine-grained understanding of how the media integrate climate change with political identities. This study presents an in-depth qualitative analysis of political identity portrayals from 229 articles published in six German and US news outlets during May-July 2019. The results show that the outlets consumed by left- and right-leaning audiences emphasise oppositional identity portrayals, portraying features that are likely to trigger a negative response towards political identities typically opposed by their recipients. The outlets with a more balanced or centrist audience offer a wider array of identity portrayals and emphasise policy questions over fundamental beliefs. Observed patterns differ considerably between Germany and the US, reflecting political and media system differences. The results add to understanding how the media contribute to political polarisation and consensus-building regarding climate change.

Keywords: news coverage, identity, polarisation, climate change, comparative research, qualitative analysis

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INTRODUCTION

Can you imagine a conservative politician advocating for constitutionally enshrining climate protection as an obligation of government? In most national contexts, this would be a challenging task. But in summer 2019, Markus Söder, the leader of the German Christian Social Union in Bavaria (CSU) and arguably the second-most important conservative politician in the country (next to then-chancellor Angela Merkel), proposed this idea alongside more concrete policy proposals. The press coverage in response offered a glimpse of how conservative identities might incorporate pro-climate ideas.

Most efforts to tackle climate change with the urgency the problem demands require broad societal and political support, and climate politics are arguably one of the drivers of changing political cleavages (Ford & Jennings, 2020). However, in some countries, including the United States, climate change politics is strongly polarised (Clark et al., 2019) and appears to deepen existing divisions. Yet, part of this apparent polarisation is not based on actual attitudes and beliefs but the result of a 'perception gap' (Yudkin et al., 2019), exaggerating perceived differences between political partisans over the reality of existing divisions. Such misperceptions matter since many people rely on mental heuristics when engaging with politically complex issues such as climate change (Rugeley & Gerlach, 2012). Knowledge about the beliefs and attitudes of social and political groups can help navigate the political landscape and the otherwise possibly distant and intangible policy options regarding climate change.

The news media are an important source of information about the politics of climate change and one of the key drivers of public perceptions of the issue (Bolsen & Shapiro, 2017). Still, media outlets report differently on climate change and politics. For example, the prominence of dismissive or sceptical stances tends to align with politically segmented audience profiles (Feldman et al., 2011; Schmid-Petri, 2015). Consequently, individual media consumption patterns are often in line with political preferences (Newman, Nisbet, & Nisbet, 2018b). They are one of the key factors in explaining how political attitudes towards climate-friendly policies develop and follow partisan patterns (Feldman et al., 2014; Gustafson et al., 2019; Newman, Nisbet, & Nisbet, 2018). Yet, the mechanism linking media consumption patterns to changing attitudes is not fully known, pointing to a need for studies going beyond thematic or frame analysis most common in studies of news reporting on climate change.

Over the past few years, political actors and questions increasingly feature in media reporting on climate change (Tschötschel et al., 2020), reflecting the trend towards a focus on policies rather than climate science denial (Schmid-Petri, 2017). Despite this development, few studies have examined how different news media integrate climate change with existing and new political identities (Morris, 2020). Understanding better what kind of identity portrayals of politically relevant actors are advanced by different media potentially adds a key piece to explaining the relationship between perceptions of political identity and attitudes towards climate policies and media consumption patterns.

Across countries and media organisations, journalists and editors must navigate different political and media institutions, cultural norms, and organisational requirements (Reese & Shoemaker, 2016). Additionally, economic and environmental histories in different countries have created various path dependencies and policy options for climate politics – meaning that contextualisation and cross-national comparison are crucial for empirically driven theory-formation. The countries in focus in this study, Germany and the United States, are major per-capita emitters and have considerable investments in their automobile manufacturing and fossil fuel-dependent energy production industries. Yet, the political response to climate change in each country and reporting on the issue differ considerably (Tschötschel et al., 2020), as do political and media systems (Brüggemann et al., 2014; Hallin & Mancini, 2004). Thus, the comparative approach presented here facilitates dissecting media portrayals of climate-related aspects of political identities and enables a context-sensitive explanation of how they fit into the bigger picture of national climate politics. The following question captures the research aim of this study.

> RQ: How do news media in Germany and the US integrate climate change in their portrayals of politically relevant identities?

SOCIAL IDENTITY AND POLITICS

Identity is a complex, multi-faceted phenomenon studied using a variety of social scientific approaches. Foregoing an in-depth discussion of how different traditions conceptualise identity, in this study, I build on social-psychological 'social identity theory' (Hogg & Reid, 2006) and 'self-categorisation theory' (Turner et al., 1994). Following this literature, individuals are familiar with a range of 'social identity prototypes' (Hogg & Reid, 2006) – shared mental representations of different

identities corresponding to social groups that individuals can identify with or consider as 'Others'. The relationship between the individual self and social identities is complex, as people can change their perceptions and evaluations of the identity prototypes they know and adjust the strength of identification with (or rejection of) different prototypes and the groups they represent (Ellemers et al., 2002). Yet, according to social identity theory, people generally 'search for positive distinctiveness' (Brown, 2020) in comparison to others, potentially explaining a range of phenomena commonly associated with identity politics.

Individuals can know a vast repertoire of social identity prototypes, ranging from relatively a-political (e.g., 'avantgarde musician') to clearly political (e.g., 'Republican', 'Green party member'). However, there is no clear-cut a-priori distinction between political and a-political identities since social identity prototypes are multi-dimensional collections of identity markers that can be associated with individuals and groups. These are 'fuzzy sets, not checklists, of attributes' (Hogg & Reid, 2006, p10), including values, attitudes, norms, goals, behaviours, etc. Consequently, 'political' characteristics can be part of 'non-political' identities and vice-versa. However, when identity markers become a part of a political identity – one strongly associated with the political realm – they can be explicitly politicised and can open a new line of political conflict, for example between allegedly radical 'Millennials' and moderate political forces (Morris, 2020).

Political identities take a central role in understanding contemporary political phenomena, not limited to identity politics. They provide heuristics for navigating the political landscape and offer individuals a way of engaging with politics, not requiring an in-depth understanding of policy or institutions. Particularly noteworthy are identities associated with political parties competing in elections – partisan identities (Huddy, 2015). Partisan identity cues can trigger recipients into 'motivated reasoning' that helps interpret information congruent with one's existing cultural and political worldviews (Hart & Nisbet, 2012).

CLIMATE CHANGE AND PARTISAN POLITICAL IDENTITY

When an issue, such as climate change, takes an increasing share of the political stage, it can form the basis of new political identities and transform existing ones. Cast in these terms, the success of political advocates and activists depends on their ability to a) build an identity that is powerful enough to influence politics independently or b) to alter existing identities in a way such that their desired

positions have powerful backing. If and how these dynamics play out at the level of political parties (and thus partisan identities) depends to a considerable degree on political institutions. When the political system allows new parties to be formed and enter representative politics easily, this is likely to happen – as can be seen in many European countries where 'Green' parties have entered national parliaments (Grant & Tilley, 2018). In other cases, such as the US, where the system discourages the formation of new parties, advocates must influence existing parties to get their issue and positions on the political agenda.

Narrowing in on the politics of climate change, the extant literature has discussed how the seemingly non-partisan 'ecological' or 'environmental' identity (Light, 2000; Werff et al., 2013) can include an attitude that favours climate-friendly behaviour and policies. However, these labels are relatively marginalised in public political discourse, at least when compared to established identities (e.g., 'Left', 'Right', 'Conservative', 'Liberal', or partisan identities). Yet, in Europe, following the successes of the Green parties often perceived to be frontrunners of climate-friendly policies, many mainstream parties have followed suit by adopting a stance on the issue (Farstad, 2017). This does not necessarily mean that all of them advocate for progressive political responses, but few parties outright ignore the issue. In the US, positions on climate change have become an element of party politics as well. Arguably, the Democratic party considers dealing with climate change part of their identity, but how so is subject to internal debate. The Republican party's position on the issue can be summarised as: 'government should not be dealing with climate change if it even exists' (Republican Party, 2016), making it an anomaly among conservative parties (Båtstrand, 2015).

STUDYING MEDIATISED IDENTITY PORTRAYALS

Media play an important role as 'gatekeepers' in selecting who and what makes the news (Vos & Shoemaker, 2009). Furthermore, they emphasise specific aspects and characteristics of the issues and actors reported on by using frames to reduce the complexity of real-world events in their reporting (Chong & Druckman, 2007). Notably, the ability to select actors and frame issues highlights that portrayals of political actors differ to a degree depending on the media consumed. An indication of the power of the media and political communication can be gleaned from media

effects studies that highlight how media consumption patterns relate to public perceptions of climate change and political positions on the issue (Feldman et al., 2014; Gustafson et al., 2019).

How media and public discourses could shape perceptions of identity has been studied frequently using discourse analytical approaches by focusing on the 'speaker positions' and 'subject positions' constructed in public discourse (Benwell & Stokoe, 2006). In the field of climate change communication, some studies have built on this approach, or one of its variants (Boykoff, 2008; Pepermans & Maeseele, 2018; Weingart et al., 2000). However, despite many calls to focus on the subjectivities and identities portrayed, few studies, discourse-analytical and otherwise, have rigorously empirically investigated such portrayals in news coverage of climate change (Carvalho et al., 2017). Overall, the extant literature on media and identities thus points to the need for a) an analysis that distinguishes between different media and b) an approach sensitive to fine-grained differences between individual portrayals, allowing the analyst to disentangle who exactly says what about whom.

ASSOCIATIONAL IDENTITY ANALYSIS

To do justice to the complex, controversial, and fluid nature of identities, I develop a theoretical and methodological approach I call 'associational identity analysis', inspired by Actor-Network Theory (ANT). Put briefly, ANT as social theory conceptualises the nature of social reality as an outcome of ongoing practices that make (and break) 'associations' between different actors resulting in groups and categories (Latour, 2005). These associations include shared practices, membership in organisations, belief in the same ideas, contractual ties, etc. ANT empirically centres how the actors studied create and contest associations amongst each other, typically using ethnographic methods (Michael, 2017; Venturini, 2009). However, how the media portray associations and group memberships has received relatively little attention in the ANT-inspired literature. In contrast, in this study, departing from its typical application and methods, I use ANT as an analytical lens to study associations expressed in news reporting and use these to reconstruct the identity portrayals depicted in the media.

Theoretically speaking, associational identity analysis highlights that media portrayals do multiple things simultaneously. First, by writing about social groups and their behaviours, norms and opinions, media associate the latter with the social identity prototype of that group directly, often normatively evaluating the identity

along the way. Second, media portray individuals as representing certain groups, giving them a platform to influence perceptions of the social identity prototype associated with the group they arguably speak for (if the audience accepts this function as a 'spokesperson' (Latour, 2005)). Third, when individuals talk about other groups they are not typically identified with (e.g., a conservative politician speaking about left-wing voters), they potentially influence audience perceptions of that outside group. But more importantly, this portrayal also makes this other-perception a part of the identity prototype associated with the speaker. Using an approach that analytically distinguishes these different aspects thus enables detailed reconstruction of how media and the people they use as sources portray political identities.

METHODS AND MATERIAL

Building on the theoretical considerations discussed above, this section presents a methodological operationalisation of associational identity analysis. The merits of this procedure lie in a primary coding stage that can serve as the basis for both qualitative and quantitative analyses, a theory-agnostic empirical engagement with the material, and a high degree of adaptability to emerging research questions and concerns, thus enabling open inquiry and theory-formation.

OUTLET SELECTION AND SAMPLING

The material analysed here stems from the output of six news outlets selected to represent three different types of news sources per country: one consumed mainly by those identifying with the political right, one consumed by those leaning to the left, and one read by both groups alike. Following the past years' trend towards online news consumption, I focus on online news sites, independent of their background as print, television, or digital-born news media. Using data from the Reuters Digital News Report (Newman et al., 2018) on self-declared political orientation and news consumption behaviour, I selected foxnews.com, abcnews.go.com, and huffpost.com in the US, and bild.de, welt.de, and sueddeutsche.de in Germany. Figure 3.1 illustrates each outlets position in the online media landscape, and Table 3.1 offers more details about their audience profiles.

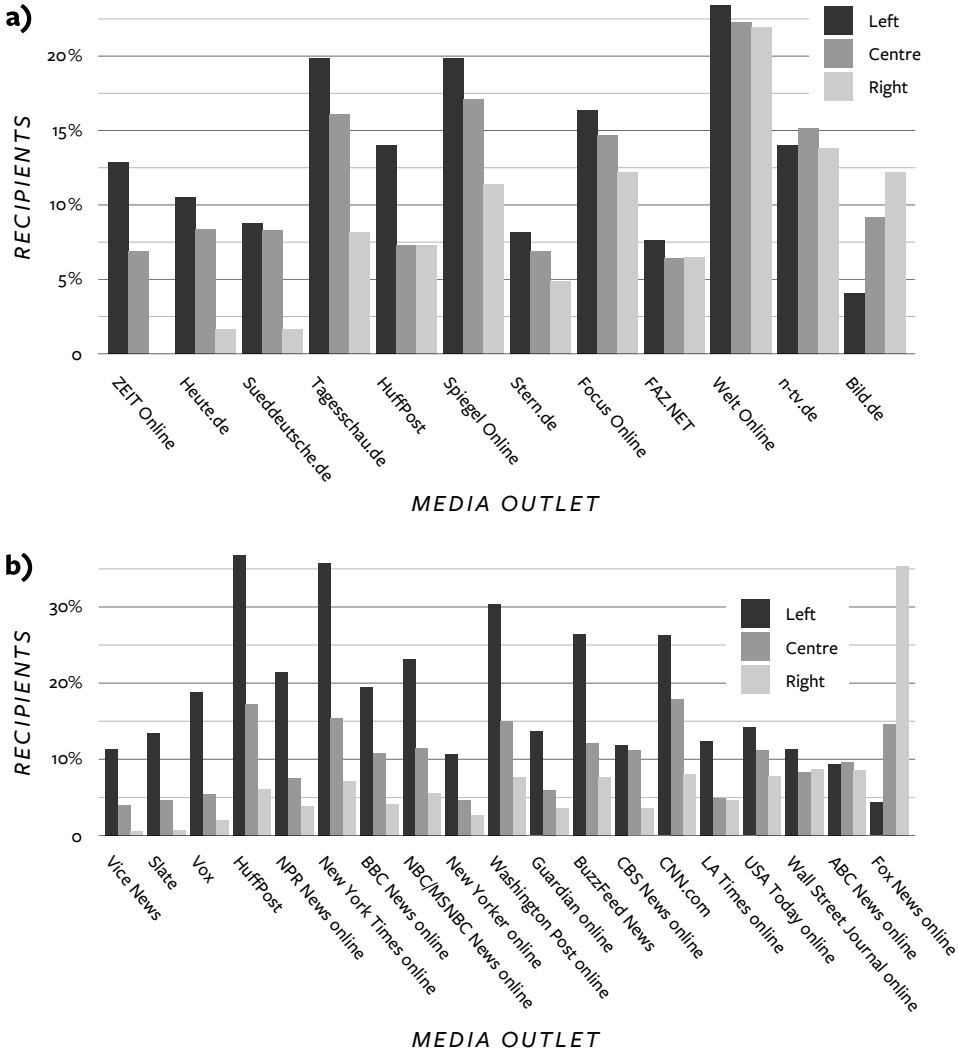
These websites' output (both articles and videos) was monitored using their official RSS feeds, and each item published checked for climate-change-related content using a simple filter. Validation of this filter using a random selection of news items

by one hired research assistant and the author showed good results. Using a set of manually coded articles (Inter-coder Agreement: Krippendorf's alpha .89) to check its quality, the filter identified 85 % of relevant news items.

Aiming to stratify our data across the investigation period, I randomly sampled a maximum of 4 items per outlet per week between May 1 and July 31, 2019. This procedure was chosen over other sampling strategies to avoid cherry-picking items that might be in line with unreflected expectations and to facilitate formulating hypotheses and theoretical accounts that warrant further quantified theory-testing. In some weeks, outlets published less than four relevant items, resulting in slightly different amounts analysed per outlet – Table 3.1 provides an overview of these data characteristics. Ultimately, out of 1043 items flagged to involve climate change in this period, my research assistant and I analysed 229 in-depth. Appendix 3A provides a collection of all articles analysed and referenced in this article.

Figure 3.1

Online media audience profiles in Germany and the United States



a) Media audience profiles in Germany
b) Media audience profiles in the United States
Audience groups are respondents identifying as 'Very left-wing' or 'Fairly left-wing', 'Slightly left/right of centre' or 'Centre', 'Very right-wing' or 'Fairly right-wing'. Recipients (%) are percentages of respondents within each audience group stating they consumed the respective outlet last week. Media outlets are all outlets with an overall audience share >5 % and exclude news aggregators (Google News, Yahoo, etc.). They are ordered by the ratio of left-wing audience share divided by right-wing audience share.

Table 3.1

Audience percentages and news items analysed per outlet

	Audience[a] (%)			News Items		
Outlet	**Left**	**Centre**	**Right**	**Published[b]**	**Flagged[c] (%)**	**Analysed[d] (%)**
Bild	4	9	12	13002	134 (1.0)	51 (38.1)
Die Welt (N24)	24	22	22	12734	466 (3.7)	55 (11.8)
Süddeutsche Zeitung	9	8	2	9241	243 (2.6)	35 (14.4)
Fox News	4	15	35	18289	102 (0.6)	27 (26.5)
ABC News	9	10	9	2786	24 (0.9)	21 (87.5)
Huffington Post	37	17	6	5747	74 (1.3)	37 (50.0)
Total				61799	1043	229

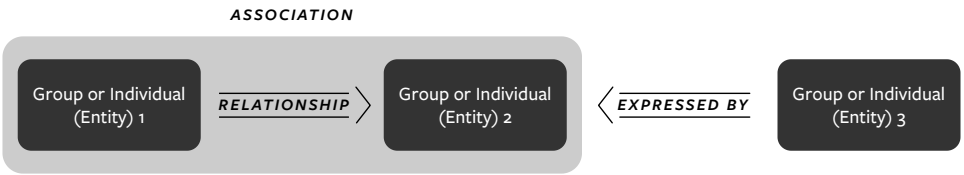
[a] Shares of respondents identifying as 'Very' or 'Fairly left-wing', 'Slightly left/right of centre' or 'Centre', 'Very' or 'Fairly right-wing' who say they have consumed the online outlet in the past week.
[b] Number of news items appearing in the official RSS feed between May 1 and July 31, 2019.
[c] Items flagged to contain information about climate change (percentage of all published items).
[d] Items subsequently selected for in-depth analysis (percentage of flagged items).

PRIMARY CODING

To analyse the corpus of news articles in-depth, my research assistant and I used a two-stage coding approach. First, we coded all associations systematically line-by-line. Each code consists of four elements: the two 'entities' (individuals, groups, organisations) that are linked (individual markers, or groupings), the relationship between them, and the entity expressing the association (Figure 3.2).

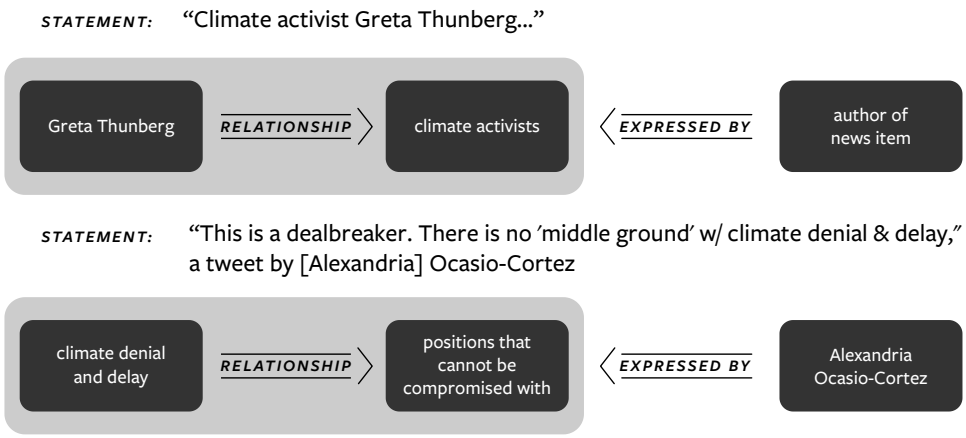
Figure 3.2

Coding scheme and examples for associational identity analysis



Associations vary from simple to complex. For example, applying an identity label to a person, such as 'climate activist Greta Thunberg,' simply categorises Thunberg as a climate activist (associating her with that group). On the other end, consider the statement 'those demanding a price on carbon emissions ignore the risks such an intervention poses for jobs and economic growth.' This phrase constructs

Figure 3.2 (continued)



two groups, 'people demanding a price on carbon emissions' and 'people who care about jobs and economic growth,' claiming that the first does not belong to the second. It also constructs another association, a factual claim that a 'price on carbon emissions' belongs to the group of 'things that pose a risk for jobs and economic growth.'

The last part of the code, the expressing 'entity', allows the analyst to distinguish between in-group self-portrayals and those stemming from an actor belonging to other groups (for example, the journalist writing the article or a political opponent). This distinction facilitates a detailed reconstruction of how different groups and individuals define and portray themselves, their political opponents, and others.

We coded all statements that made relevant associations, given our research interests – meaning we ignored all associations that were not in some way related to climate change or climate-related policy or politics. Note that coding these often-complex statements always includes interpretation and abstraction. Still, the empirical approach developed here allowed us to analyse associations at all levels of complexity with empirical rigour.

SECONDARY ANALYSIS

In the second stage of analysis, I revisited the primary codes and analysed the coded material. First, I identified identities central to this analysis. This was chiefly driven by the a-priori focus on partisan political identities (those associated with political parties). However, one other group of actors appeared as a central political subject in the material: the young protesters that went on school strikes and took to the streets achieved a considerable media presence, particularly in Germany, and

are thus included in this analysis. While a prominent actor group in climate change news, scientists were only infrequently portrayed with a political stance and are therefore excluded from this presentation. An in-depth analysis of the separation between politics and science in news reporting would make an interesting subject of study but is beyond the scope of this article.

Second, adopting an approach akin to a logic of theoretical sampling (Glaser & Holton, 2004), I identified which types of associations drive identity portrayals, resulting in three categories. First, associations based on behaviours denote the things people do, be it deliberate or inadvertently. Second, those based on objects of knowledge represent ideas concerning social and physical reality. They include both prescriptive values and norms – rules for behaviour aimed at promoting or protecting something that is considered valuable – and descriptive claims such as facts, cause-and-effect relationships, explanations, etc. Finally, I separated policy positions (the attitudes to and beliefs about policy ideas and specific policies) from other objects of knowledge, reflecting the fact that much political discourse revolves around policy. The results of this systematisation are presented for each outlet and identity group in Appendix 3B and are exemplified in Table 3.2.

Table 3.2

The 'Green New Dealers' in Fox News

Behaviours	Objects of Knowledge	Policy Positions
lie to their own supporters[1]; use apocalyptic language[6]; want to end the debate on climate change[6]; link tornado warnings to CC[10]; discredit their opponents[17]; would send the economy into depression[17]	acting on CC is a moral question[1]; CC drives migration[1]; there is no middle ground on climate change[2]; the New Deal will create millions of jobs and reduce inequality[4]; CC will set parts of Florida underwater[6]; CC is biggest challenge for humanity[8]; climate change causes tornado patterns to shift[10]; climate crisis is real[10]; adopting Draconian measures will serve as a global example[17]	support the Green New Deal[1,10]; a radical reorganisation of the entire economy[1,4]; provide prosperity and economic security to all Americans[4]; 100% renewables[4]; a 100% job guarantee[4]; government-focused policies[6]; take money from rich people[8]; massive tax expansion[17]

Note: References to news items can be found in Appendix 3A

Third, I developed a theoretical interpretation of how each outlet portrays the three identities, using techniques derived from abductive analysis (Tavory & Timmermans, 2014): defamiliarisation from 'normal' modes of news consumption, revisiting my data on multiple occasions over time, and developing alternative

accounts, weighing their explanatory power against each other. The following section presents the outcome of this first step of theory-formation, serving as a basis for an integrative discussion following thereafter.

EMPIRICAL RESULTS

As I take up each outlet in turn, I discuss the identity constructions gleaned from my data as if they were factual. These interpretations are rooted in statements made by the authors of the news item or by giving voice to somebody carrying the identity label. Statements about other groups are seen as ways of defining one's own identity and are included in these descriptions as other-perceptions (see Methods discussion above) – rather than taken as objective statements describing the other group. References to news items are numbered by outlet (see Appendix 3A).

THE UNITED STATES

In the United States, the build-up to the Democratic Party's primary election received ample attention from the news media and drove reporting about climate politics and policy. Media portrayals focused on proposals for a 'Green New Deal,' a package of economic and environmental (climate) policy reforms. On the other side of the aisle, coverage focused on Republicans' opposition to the Green New Deal, resistance to climate legislation, and the Trump administration's rollback of environmental regulations. Portrayals of young activists (most frequent in Huffington Post) complemented the picture.

Fox News: beware the socialists

Fox News centres its climate-related reporting on mainstream US Democrats and the 'Green New Dealers'. Dominating the Democratic party, the latter see climate change as a moral issue that warrants a 'radical'[1] transformation of the country's economy, where 'middle ground' approaches are not enough[2]. In most of Fox News' coverage, the Green New Dealers also want to expand the welfare state through 'job guarantees,' combating economic injustice, and increasing government intervention in the economy[1,4]. They are ready to 'weaponise the government'[3] – using executive power[5] and prosecuting climate change sceptics[3,5]. Since coverage of 'moderate' Democratic positions or conflict within the party is rare, Fox News paints a strongly prototypical picture of Democratic identity as essentially socialist, using climate change as a pretence to impose their views.

Scared by Democratic 'apocalyptic language'[4] and their attempts to wrongfully link climate change to migration and specific extreme weather events, young voters (millennials) 'see the threat of climate change as real,' want action on climate change, and ignore 'rational debates on the topic'[11]. Some of them, organised in the Sunrise Movement comprised of democratic millennials, actively lobby for the Green New Deal[2].

Republicans, on the other hand, are ready to defend their constituent's interests using their constitutional rights, such as 'walking out' of the Oregon legislature to prevent a vote on a climate bill[5]. And overall, 'Republicans, including in the White House, have been sceptical about climate change and have opposed Democrats' government-focused ideas to combat the threat'[6]. Consequently, they are equivocally critical of the Green New Deal, with some viewing it as a 'radical, top-down, socialist makeover of the entire US economy'[4], in line with the portrayals of Democrats by Fox News.

In sum, Fox News follows the version of identity politics promoted by Republicans appearing in the outlet, painting the political conflict around climate change as a matter of defending America against a radical-left, socialist attempt to use whipped-up fears for an expansion of government.

ABC News: policy focus and intra-party divisions

In ABC News, most Democrats see climate change as a global, existential threat[2,4,10,18] that warrants immediate action[1,13]. Most Democratic primary candidates propose policies to tackle the issue by re-joining the Paris Agreement, investing in infrastructure and emissions standards to reduce fossil fuel consumption and GHG emissions[2,4,10,13]. However, in contrast to Fox, health care and job creation plays a minor role in the coverage of ABC News, and the outlet portrays a broader array of Democratic stances on the issue. Some candidates offer farther-reaching proposals, opposing other 'middle ground' approaches[2,4,10,13], leading to significant debate within the party[13].

ABC News highlights the attitudes of young people by citing a Harvard Poll reporting 'a substantial 14-point increase [...] in those who said they believed 'government should do more to curb climate change, even at the expense of economic growth'"[10]. They also mobilise political scientist Dana Fisher, stating that 'active and progressive young Americans [are] probably the most engaged electorate right now'[4], placing

them in the Democratic camp. Thus, young people appear chiefly as left-leaning voters, albeit this time driven by political considerations and agency, rather than irrational fears.

On the Republican side, ABC News lays the focus on the actions and positions of the Trump Administration. The latter views its policies as environmentally friendly[5], despite opposing the Paris Climate Accord and the Green New Deal, and rolling back Obama-era regulations[3,6], which are 'destroying jobs' and 'singling out' coal[5]. ABC News offers examples of within-party divisions over policy, citing former Republican EPA directors who are seriously 'concerned' over the agency's direction and criticise President Trump's handling of the environment and attitude towards science[3].

Overall, ABC News offers much less prototypical portrayals of Republican and Democratic identities, creating an opportunity for the reader to potentially broaden their perception of what it means to be part of either political camp.

Huffington Post: Democratic primary infighting and Republican denialism

Huffington Post's reporting on Democratic positions focuses firmly on the Green New Deal, here a combination of a commitment to achieving net-zero emissions with job promotion and other welfare and economic reforms[2,3]. However, the different policy proposals separate progressive from centrist factions of the party[1]. The former view climate change as an emergency that has only benefitted fossil fuel companies[28] – an existential crisis[18,19,26] that warrants rapid reform[3] and rejecting middle ground ideas[17,19,28]. In this, they are followed (and sometimes driven) by the liberal and young Sunrise Movement, thinking its 'generation's survival is at stake' and demanding more debates focused on the issue[3].

Accordingly, some members of the Democratic National Committee think that climate change is 'the No. 1 issue for younger voters in our party'[3]. Yet, while there is considerable pressure from the young activist base[6,7,8], the party establishment is apprehensive of placing too much focus on the issue[5]. Similarly, 'mainstream' Democrats, while agreeing with the urgency of climate change, advocate for separating climate protection from other reform initiatives or promote more moderate plans[4,17].

Strikingly, reporting on the Democratic primary is largely disconnected from portrayals of Republicans and the Trump administration, who nonetheless appear frequently. According to Huffington Post, Donald Trump is a climate denier[9,10,11], opposing meaningful regulation to tackle climate change[9] and claiming that

such policies would 'punish' workers and industry, especially in the coal sector. Republicans are generally supporting Trump's views[12], the Administration's continued deregulation of fossil fuel and car industries[13,14], and oppose regulation aiming to reduce carbon emissions[15].

Taken together, the portrayals of Huffington Post present a wide array of Democratic identities in their extensive coverage of the party's primary and are the only outlet giving a relatively prominent position to young activists. On the other hand, Republican's identity portrayals are prototypical, focused on their link to the fossil fuel sector and policy blockade.

GERMANY

In Germany, reporting focused on three issues. First, on a wave of protests by young people, often associated with the 'Fridays for Future' movement. Second, on the European parliamentary election and the EU-level policy positions advocated for by different parties. Third, on the so-called 'climate cabinet' ('Klimakabinett'), a government task force to develop a policy plan across ministerial competencies to achieve Germany's Paris Agreement commitments. For reasons of parsimony, the discussion presented here excludes 'Die Linke' and the 'Alternative für Deutschland,' receiving almost zero coverage in the media analysed.

Bild Zeitung: prohibitions vs incentives?

Bild appears to organise political divisions chiefly around a critique of the Green party as a 'Verbotspartei' (prohibition party). Some party members are portrayed as advocating for the prohibition of meat products and plastics[11]. Together with the Social Democrats (SPD), they are frequently shown in their opposition to short-distance flights[2,3], toying with the idea of prohibiting them alltogether[2,5,27] and promoting train travel instead[1,8].

However, this emphasis only creates weak opposition to the Union block, supporting a tax reduction on rail tickets to promote a more rapid transition from air to train travel[1,2,6,8] 'without prohibitions.' The conflict is more pronounced in portrayals of the market-liberal FDP, attacking the Greens for stoking fear, 'moralising' the debate and advocating for a 'planned economy'[7] that takes away people's cars and meat[11], arguing this will make people angry and lead to a loss of competitiveness[7]. Considering the FDP-Greens conflict alone, the climate-related portrayals of political identities in Bild Zeitung appear similarly exaggerated as in Fox News' reporting.

Yet, returning to the governing parties, the picture gets more complicated. The SPD is a staunch promoter of its carbon tax-and-dividend proposals[1,19], arguing for this approach to reconcile social and ecological issues. Both parties in the conservative 'Union' (CDU and CSU) support German and European climate neutrality by 2050[6,26]. The CSU is creating a more activist profile, for example by arguing climate protection should be part of the 'Grundgesetz' (Germany's constitutional-rank 'basic law')8, and by supporting a rapid exit from coal[6,8], which CDU politicians say would affect certain regions out of proportion[6,9]. Thus, both SPD and Union are portrayed as combining climate protection with a concern for social or regional fairness, in line with their prior political identities.

In Bild, Fridays for Future activists and the German youth receive ample coverage, but this is mostly separate from reporting on parties and policies. According to the outlet, they are driven by a concern over governments' (and grown-ups') ignorance of climate change[9,12], which they see as an existential threat[22,23]. They skip school to protest peacefully[10,23,29] (in Germany and Brussels[20]) and are successful in making climate change a top issue in the European election[21]. While some activists' opposition to meat consumption and flying brings them close to the Green party, overall, their 'activist' identity is relatively independent of political affiliation.

Die Welt: consensus for transformation, but how?

According to Die Welt, almost all political identities include a combined concern for social fairness and commitment to climate protection. The SPD and the Greens want to compensate the burden of a carbon tax by paying a 'climate dividend' to lower-income groups[1,2,3,4], which they argue will avoid unrest over new taxes (as seen in France)[4]. The Union parties (CDU and CSU) equally express wariness over new burdens on citizens or the economy[4] out of concern over urban-rural and East-West divides[3,7,8] as well as social upheaval[3,4]. In 'Die Welt', young protesters demand 'structural change that also maintains employment'[18], established through 'concrete measures' rather than mere 'commitments'[17], allowing governments to live up to their own (Paris Agreement) commitments[9].

However, policy conclusions differ between parties. In opposition to the carbon taxes favoured by SPD and Greens, the Union prefers emissions trading. Similarly, the FDP, infrequently portrayed in Die Welt, argues against taxes and for a European (if not global) emissions trading scheme to protect economic growth and promote emissions reductions elsewhere[4,24].

The when and how of the exit from coal-powered energy production is the most substantial dividing issue in Germany, yet it does not follow classical left-right divisions. The governing parties (SPD, CSU, CDU) propose a coal phase-out by 2038[20,31]. For this, they are heavily criticised by Fridays for Future activists, wanting a more rapid exit from coal[20] and a declaration of climate emergency[9]. Claiming to represent the voices of the Fridays for Future movement[7], for the Greens, the whole government (consisting of CDU, CSU, and SPD) has slowed down the energy transition and shown a general lack of action on climate change[6], for example by its slow exit from coal[20].

Overall, Die Welt, similar to ABC News above, offers a broad range of identity portrayals for most parties and emphasises how they combine the desire to act on climate change with their existing party profiles, with proposals and dividing lines changing the political map.

Sueddeutsche Zeitung: youth-determined Zeitgeist vs status quo

More so than the other outlets, reporting in the 'Süddeutsche Zeitung' focuses on young protesters and the Fridays for Future Movement. They are disillusioned with the inaction of politicians in power, allowing corporations to profit from endangering the future of the now young[12,13,14,15]. For some protesters, climate change triggers a question of system change, questioning the legitimacy of capitalism[15]. Being politically active by protesting and striking[12,18,20], they see grown-ups relying on the movement to set the issue on the agenda and demand their participation in pressuring politics to finally act[12]. Consequently, the young protesters have a relatively strong left-wing identity, and according to the outlet, they flock to the Green party, which benefits from the 'Zeitgeist'[5] by having a credible stance on the issue.

The Social Democrats claim scientific evidence, presenting multiple studies for their carbon tax and dividend to 'reward' climate-friendly behaviour[1,8,9]. Yet, they stress the need to protect commuters and renters[2] and advocate for expanding the European carbon emission trading scheme[2], having little new to offer. Similarly vague, the CDU advocates for a long-term (2050) goal of carbon neutrality[3,11], stressing the need for coordinated action[11] and global[2] and national carbon prices[9]. Similarly, the CSU makes its opposition to carbon taxes a central issue[6] and favours European emissions trading[6]. While claiming to let 'economy, ecology and social affairs go hand in hand,' the CSU advocates a climate-neutral Bavaria in 2040[6,7]. The FDP, marginally covered in SZ, advocates for the market- and technology-based solutions, with minimal (national or European) state intervention[2], and claims that changes to German's current lifestyles shouldn't be necessary[4].

Thus, in Süddeutsche Zeitung, the politics of identity related to climate change play out in more abstract terms, centred on the question of who can offer the most inspiring ideas. According to the outlet, absent in-depth discussion of their policies, the Greens appear to do so, while other parties lack vision and present only well-known positions.

DISCUSSION

This study set out to study differences and similarities between how German and US media outlets integrate climate change with existing and new political identities. The results presented above reveal remarkable differences between outlets that follow patterns with a certain degree of stability across countries. Therefore, depending on the outlet consumed, audiences will encounter different representations of what it means to be a Democrat or Republican, a member of one of the German parties, or a young citizen.

POLITICAL IDENTITIES AND CLIMATE CHANGE

This study was chiefly motivated by the question of how media reporting contributes to making climate change a feature of existing political identities or newly emergent ones. Theoretically, I approached identities not as an essential characteristic of groups or individuals, but as media portrayals of 'identity prototypes' (Hogg & Reid, 2006) that might exercise power by influencing individual perceptions of what it means to be 'Conservative', 'Green', a 'young activist', etc. Taking a step back from the outlet-specific portrayals, I argue that the identity-transforming nature of climate change is apparent in media reporting in both countries and across outlets.

Both Democrats in the US and the Green party in Germany are, across outlets, portrayed as having fully embraced climate-friendly policies. The mediatised identity of the German Green party arguably includes elements of the so-called 'ecological' or 'green identities' associated with environmental movements (Light, 2000). On the other hand, portrayals of US Democrats are focused on how they view climate change as an economic and justice issue, side-lining nature-oriented aspects.

Furthermore, climate change has become an element of the portrayed identities of other German parties as well. Similar to the US Democrats, the German Social Democrats are portrayed to be prominently touting the horn of combining environmental friendliness with social fairness. On the centre-right, the Union parties (CDU

and CSU) have managed to be portrayed as the managers of a business-friendly transition to carbon neutrality. And the FDP, with the least pronounced profile on climate change, is presented as the party promising carbon-price driven market solutions and individual freedom from government regulation. Note that all German parties discussed here are portrayed to embrace the idea of economic transformation towards net-zero emissions, thus incorporating elements of an ecological identity.

The US Republican party is the most complex case, but I would argue that climate change plays a vital role for the party: opposition to climate-friendly policies has become a core element of Republican identity. This view is in line with findings that climate 'scepticism' has shifted from science denialism to policy opposition (Schmid-Petri, 2017) – albeit Huffington Post is still emphasising science denial as central to Republican identity.

Next to transforming existing partisan identities, climate change has also driven the emergence of a new (non-partisan) one on the European scene: the Fridays for Future movement. It is organised around a clear yet somewhat abstract demand: more and rapid action on climate change to limit warming in line with Paris Agreement goals. Their activists behave environmentally friendly, at some personal sacrifice, and demand the same of their peers and parents, using their status as future-affected to derive a position as a moral and ethical vanguard. In contrast to other findings (Zabern & Tulloch, 2021), my results show that these positions are portrayed across the media analysed.

The Sunrise Movement could be seen as a US counterpart, but it has been readily subsumed under the liberal/Democrat political identity label. Arguably, we're living in an era of 'identity politics,' where most political contestation is organised around 'struggles for recognition' of one's situation (Honneth, 2012). Having an independent, somewhat non-partisan recognised identity means being able to influence public and political discourse while allowing all parties to respond in a way that tries to co-opt part of the movement via attempts to have a stronger profile on the climate as part of their identity.

In sum, I argue that the media portrayals of the political and party identities analysed here should be read as evidence of an ongoing transformation of political identities in response to climate change becoming an increasingly important political issue. Yet, my findings also reveal how portrayals of parties differ at times remarkably

between outlets consumed by left- and right-leaning audiences. These differences offer an important piece of evidence linking media portrayals to changing attitudes towards climate politics and policies.

POLARISATION AND OPPOSITIONAL IDENTITY PORTRAYALS

The first striking observation is that the 'polar media', read more exclusively by left- or right-leaning audiences, tend to emphasise differences between parties, particularly in the US. This tendency, not unique to the case of climate change, is likely to reinforce polarisation and 'perception gaps' (Yudkin et al., 2019) between political partisans. In both countries, polar media outlets tend to portray audience-outgroup identities in a way that is likely to create opposition to that identity among their typical audience.

This tendency is most apparent in the US, where Fox News portrays Democrats as fear-mongering socialists using climate change as a pretence for a government take-over, with Republican positions reduced to opposition to these efforts. And indeed, opinion change among Republicans (in particular Fox News recipients) is a key factor in developing partisan polarisation over the Green New Deal (Gustafson et al., 2019). Conversely, Huffington Post paints all Republicans as climate deniers, contributing their share to the widening gap.

In the German case, similar tendencies are at play, but they are less pronounced. Bild emphasises that the Greens (and the SPD) want to work with strict prohibitions, whereas this information is less central in the other two outlets. On the other end, SZ portrays the Union parties as out of touch, and the Greens to be the only party with a sense for the 'Zeitgeist'. Yet, across all outlets, the parties discussed here share a consensus regarding the necessity to considerably reduce emissions over the coming decade.

In addition to emphasising negative traits of political identities likely opposed by the audience, polar outlets tend to portray both left- and right-wing identities as more prototypical – with less diversity and in-group disagreement – than the 'centrist' media. This is remarkable, as intra-party conflict arguably holds news value (Bennett, 1996) and is covered in centrist media. The tendency to emphasise prototypicality appears to be most pronounced in Fox News, where no portrayals of disagreement among Republicans or Democrats were found in the sample. German polar outlets reported on divisions within the left- and right-wing blocks, but portrayals of within-party divisions are equally rare. In line with the first tendency, prototypicality is likely to enhance the effects of group portrayals (Seyranian, 2014).

I suggest that the combination of both tendencies (negative outgroup portrayals and high prototypicality) results in an identity-affirming reporting style avoiding confrontation with cues creating dissonance with existing perceptions of partisan identities. In the US, these portrayals reinforce perceptions of identity prototypes that contain beliefs about climate change and policy positions deeply enmeshed with fundamental beliefs associated with either party, emphasising existing divides concerning values (Lucas, 2018) and attitudes towards policy (Pechar et al., 2018). This dynamic is, in my view, likely one of the reasons why selective exposure tends to reinforce existing worldviews in the US (Newman, Nisbet, & Nisbet, 2018).

In the German case, similar reporting patterns are at play – however, fundamentally speaking, climate change appears as a unifying force, with most party identities including a pro-climate stance. Divisions over policy thus seem much less fundamental, and the within-block divisions lead to stances on the issue mapping less neatly on the left-right scale. German media thus facilitate consensus-building across political identities, whereas US media tend to reinforce polarisation that possibly already exists at the identity level (Bliuc et al., 2015).

The drivers of these country-level differences lie, in my view, in the political and media landscape. Politically speaking, the German multi-party system creates multiple lines of divisions that do not map as neatly on a left-right scale as the US two-party system does, and the media systems in both countries exacerbate political tendencies. In the US, large shares of news recipients consume what I described as 'polar media', while the centrist media are relatively unpopular (Figure 3.1 in the Methods section). In Germany, on the other hand, more centrist outlets are consumed widely, whereas the polar media cater to smaller audiences. In addition, a large state-funded but politically independent, free public broadcasting system (Brüggemann et al., 2014) offering an ostensibly 'neutral' perspective creates pressure on the polar media to appeal to politically diverse audiences to increase market shares. Taken together, my findings and these observations suggest that the different media systems of these two countries do their fair share in exaggerating existing identity polarisation (in the United States) and building centrist consent across party lines and political identities (Germany).

LIMITATIONS

These generalisations should be read as the outcome of an inductive theorising process underlying a range of limitations. First and foremost, the propositions I put forward have not undergone quantified theory-testing. While I consistently cross-checked my findings and accounts with the available data, further research is

needed that quantitatively operationalises the concepts I use, such as audience-adjusted identity portrayals and identity prototypicality. Such an operationalisation could be used for quantitative theory-testing of the proposition that 'polar media' tend to emphasise prototypicality and negative outgroup-portrayals. Quantification also can enable testing these hypotheses in the context of other politically contentious issues or in other countries.

Second, my findings are based on data gathered in a period marked by some idiosyncratic events. In the United States, the onset of the Democratic primary campaigns meant that candidates had to present policy ideas and priorities to sharpen their profiles, which is likely to generate more extreme positions. In Germany, the Fridays for Future movement and the European election heightened attention for the issue, which pushed political actors to adopt positions that otherwise could have avoided the issue altogether. While the observed tendencies and cross-country differences might be less pronounced in other circumstances, I do not believe that they critically influence the direction of my findings. Yet, a longitudinal perspective would be very valuable.

Third, from a theoretical perspective, I want to stress that the present analysis is focused on portrayals of political identities rather than the perceptions of news recipients. I have discussed some reasons to believe that mediatised portrayals might impact individually held beliefs about in- and outgroup political identities. Yet further empirical research is needed to test the role of identity perceptions as a mechanism to explain polarisation over politically contentious issues, such as climate change.

CONCLUDING REMARKS

To conclude, based on the systematic qualitative analysis I conducted, I would argue that, indeed, climate change is increasingly becoming a considerable element of existing partisan political identities. It also shapes a new political identity based on the young's status as strongly affected by climatic changes. In addition, my findings suggest that 'polar media' consumed by primarily right or left-leaning audiences can contribute to identity polarisation. They vary in their portrayals of the identities in a way that often reinforces their audiences' existing perceptions of political groups' beliefs and attitudes towards climate change.

Overall, my findings indicate that the more exclusively an outlet is read by the political left or right, the narrower its portrayals of political identities and the role of knowledge about climate change and policy within them. In the light of these findings, one of the key challenges for political movements aiming to push for a more significant response to climate change lies in finding ways to have their ideas become a positively integrated part of partisan identities across the political spectrum or develop one that can develop political force on its own. To do so, they must navigate a media landscape where some outlets tend to exaggerate and polarise, posing a considerable communicative challenge.

chapter 4

climate change policy support, intended behaviour change and their drivers unaffected by consensus messages in Germany

ABSTRACT

How can communication contribute to reducing greenhouse gas emissions through behaviour change and policy support? The existing literature emphasises informing people about the scientific consensus on climate change, but the underlying research has been conducted mainly in the US, where prior beliefs in human-made climate change are lower than in many other countries with the highest per-capita emissions. We test consensus messages in an 'extended gateway belief model' using a pre-registered survey experiment on a representative quota sample of the German population (N = 1171). Our data show that consensus messages are likely to have no or only minimal effects on perceived scientific agreement, intended behaviour change and policy support. Still, in line with prior research, we find that perceived scientific agreement, belief in climate science, efficacy beliefs, and worry about climate change predict policy support and intended behaviour change. These results demonstrate that effective communication needs tailoring to its local context

Keywords: gateway belief model, consensus messages, policy support, behaviour change, efficacy beliefs

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INTRODUCTION

What drives people's willingness to engage with climate change, alter their behaviour, and support public policy to reduce greenhouse gas emissions? As climate change is making its impacts felt with growing forcefulness and further mitigation is becoming increasingly urgent over the current decade (IPCC, 2018), answering these questions is a crucial challenge for policymakers, activists, and scientists worldwide. The 'gateway belief model' (van der Linden, Leiserowitz, Feinberg, & Maibach, 2015) offers an important insight, describing two associated phenomena: first, it states that 'consensus messages' informing people about the actual 97%-level of agreement among climate scientists that climate change is happening and human-made (Cook et al., 2016) can trigger considerable changes in individual perception of the level of scientific consensus. Second, this change of perception acts as a 'gateway belief' and leads to effects on key beliefs about climate science, worry about climate change, and ultimately support for public action.

While there is compelling evidence for the model's predictions, including a large scale-replication in the United States (van der Linden, 2021; van der Linden, Leiserowitz, & Maibach, 2019), there are signs that consensus messages can be met with motivated reasoning and reactance. The available evidence is mixed, with some studies reporting both reactance and 'backfire' effects for some respondent subgroups (Cook & Lewandowsky, 2016; Ma, Dixon, & Hmielowski, 2018), some reporting evidence for reactance only (Chinn & Hart, 2021) while others find neither (van der Linden, Maibach, & Leiserowitz, 2019). Going in-depth with the resulting debate (Bayes, Bolsen, & Druckman, 2020; Dixon, Hmielowski, & Ma, 2019; van der Linden, Leiserowitz et al., 2019) is beyond the scope of this paper. Overall, the bulk of evidence supports the notion that most message recipients alter their perceptions of scientific agreement towards the actual 97 % level of scientific consensus (Cook, 2019; van der Linden, 2021). However, most studies on the Gateway Belief Model and the effects of consensus messages were conducted in the US, the UK, Australia, and New Zealand, apart from one experimental study in Japan (Kobayashi, 2018) and correlational studies in Europe (Cook, 2019). This study adds to this body of evidence by experimentally testing consensus messages, with and without added political cues, in Germany. It also offers extensions to the original model, discussed in detail further below.

INTERCULTURAL DIFFERENCES

Why is there a need for additional evidence from non-anglophone countries, in particular continental European ones? Notwithstanding much lower per-capita emissions and being closer to their nationally determined contributions, like the United States, most other high-emission countries in Europe need additional efforts to achieve their Paris Agreement commitments (Roelfsema et al., 2020). Still, available studies point to considerable differences regarding extant beliefs about climate change and attitudes towards climate science and policy. For instance, while an increasing number of US adults agrees that climate change is happening and human-made, average levels of agreement lie around 60 % in the US (Leiserowitz et al., 2020a). This is considerably lower than in many European countries, where similar numbers in most countries lie above 90 % (Poortinga et al., 2018)[6]. In addition, whereas belief in climate science and support for public action is strongly aligned with political leaning in the US (Leiserowitz et al., 2020b), in most European countries, the need to act on climate change can be considered a political consensus position (European Commission, 2019), typically only questioned by small radical-right wing parties.

These intercultural differences at the individual and political level are reflected in mediated reporting about climate science and politics. News recipients in the US are more frequently exposed to political information questioning climate science than in many other high-emitting countries (Painter & Ashe, 2012; Tschötschel et al., 2020), even though these portrayals are often linked to journalistic evaluation (Brüggemann & Engesser, 2017). Research has shown that partisan selective exposure (Stroud, 2010) to 'conservative' news sources is one of the key contributing factors to politicisation and polarisation around climate policy (Feldman, Myers, Hmielowski, & Leiserowitz, 2014; Gustafson et al., 2019; Hmielowski, Hutchens, & Beam, 2020). In contrast to the US, in many European countries, most news outlets are consumed more widely across the political spectrum (Newman et al., 2019).

In summary, many continental European countries can be characterised as a 'high-consensus' context, where, in comparison to countries like the US, the issue is less polarised and less frequently subject to public denial by political and opinion leaders. Consequently, the conversation has moved away from debating climate science and whether public action is needed and is instead focused on

6 Survey wordings and scales differ slightly: the European numbers are based on an answer category stating that climate change is "at least partly" caused by humans, whereas the wording used by Leiserowitz et al. (2020a) is "mainly" caused by humans. At the other end of the scale wordings overlap: in the US 30 % answer that climate change is "mainly caused by natural causes", whereas in most European countries, around 5 % choose the answer category with the same wording.

debating different solution strategies. One explanation for the effects of consensus messages in the US lies in their potential to reduce existing political polarisation surrounding the issue (van der Linden, 2021). Thus, the cross-country differences raise the question of whether consensus messages can have a similar impact in the high-consensus context typical of many other high-emission countries. In this study, we offer evidence from Germany, a typical case of this group.

CONSENSUS MESSAGES, PERCEIVED SCIENTIFIC AGREEMENT AND POLITICISATION

First, we examine whether simple consensus messages ('97 % of scientists agree that human-made climate change is happening') have considerable impacts on perceived scientific agreement and downstream variables. Notwithstanding the intercultural differences discussed above, we expect that this message will have an effect on perceived scientific agreement (hypothesis 1a) – albeit these are likely to be smaller than in the US or similar countries. In this study, we operationalise perceived scientific agreement as a latent variable, encompassing agreement on anthropogenic origins, as well as consequences and urgency.

The extant literature suggests that (political) identity can amplify or dampen the effects of consensus messages. Using 'ingroup messengers' and identity cues can enhance the effects of pro-environmental and pro-climate messages, particularly for audiences previously politically opposed to mitigation policies (Fielding et al., 2019; Goldberg, Gustafson et al., 2019; Hurst & Stern, 2020). On the other hand, outgroup cues have, in some circumstances, been linked to adverse effects, leading audiences to abandon typically preferred policy options when in response to endorsement by outgroup leaders (Kousser & Tranter, 2018). As media analysis has shown, a large share of statements related to climate change (in particular policy) can be attributed to political actors, often politicians (Tschötschel et al., 2020), and real-world reporting often mixes scientific (consensus) information with political cues. We test whether such effects of political cues can be observed in the high-consensus context outlined, expecting positive effects for ingroup cues (hypothesis 2a) and dampening effects for outgroup cues (hypothesis 3a) of consensus messages on perceived scientific agreement.

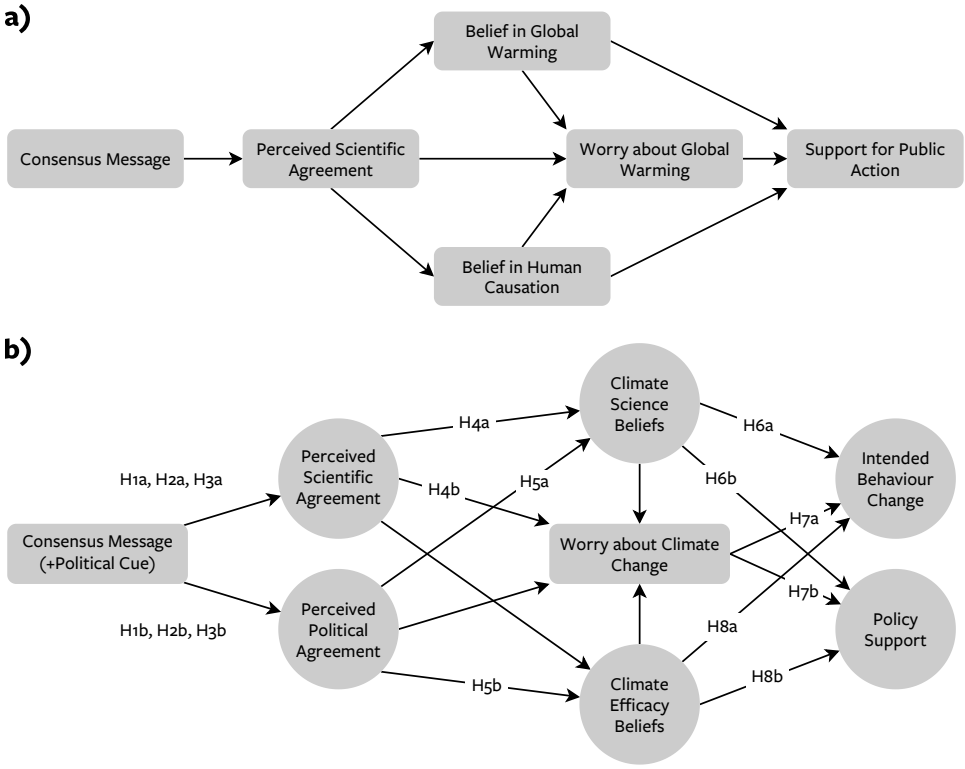
A PARALLEL GATEWAY?

To further account for the differences in context, we offer a range of extensions to the original gateway belief model (Figure 4.1). The core idea of the 'extended gateway belief model' (see Figure 4.1) is that consensus messages with political cues could unlock a parallel gateway that operates via perceived political agreement about climate science. Recent research has shown that perceptions of the social and political environment can affect how people think about climate change. For instance, perceived 'social consensus' has been shown to 'reduce ideological bias' about climate change (Goldberg, van der Linden et al., 2019; Lewandowsky et al., 2019) and perceptions of ingroup agreement with climate science can drive engagement with climate change (Ballew, Rosenthal et al., 2020). We use the perceived level of political agreement with climate science – operationalised analogously to perceived scientific agreement – as a proxy for such social beliefs. We expect that consensus messages without political cues do not affect this variable (hypothesis 1b), while those attributed to ingroup politicians lead to stronger/positive effects (hypothesis 2b) and those attributed to outgroup politicians to weaker/negative effects on perceived political agreement (hypothesis 3b).

The extant literature shows that a combination of worry about climate change and efficacy beliefs are key predictors of information seeking, policy support and pro-environmental behaviour and behaviour intentions (Bradley et al., 2020; Chu & Yang, 2020; Hart & Feldman, 2016; Hornsey et al., 2015; Mead et al., 2012; Milfont, 2012). Nevertheless, the exact relationships between climate science beliefs, worry about climate change, and efficacy beliefs are not well established. Some studies suggest that efficacy beliefs are an outcome of risk perceptions, concern or worry about climate change (Bradley et al., 2020; Hornsey et al., 2015; Milfont, 2012). Others, often building on the extended parallel process model (Witte, 1992), argue that efficacy beliefs form in parallel with perceptions of threat or risk and have independent and interaction effects on behaviour, attitudes and other responses to climate change (Chu & Yang, 2020; Hart & Feldman, 2016; Mead et al., 2012). We follow this line of thought and model efficacy beliefs as a parallel mediator between perceptions and outcomes.

Figure 4.1

Original and extended Gateway Belief Model linking exposure to consensus messages with intermediate and outcome variables



a) Conceptual depiction of the gateway belief model (van der Linden et al., 2015): following exposure to consensus message (treatment), changes in perceived scientific agreement act as a 'gateway' mediating changes in key beliefs and support for public action.
b) The extended gateway belief model informing this study, adding perceived political agreement and climate efficacy beliefs as 'parallel' gateway, predicting more complex outcomes. Note: circles depict latent constructs, boxes manifest variables.

In line with the original gateway belief model, we expect perceived scientific agreement to predict climate science beliefs – here operationalised as a latent variable encompassing reality, anthropogenic origins, consequences for humans, and urgency of action – and worry about climate change (hypothesis 4a/b). Analogously, and in line with the discussion of social consensus effects above, we expect perceptions of political agreement to predict climate science beliefs and efficacy beliefs (hypotheses 5a/b). In addition, we explore the links between perceived political agreement and worry, and those between perceived scientific agreement and efficacy beliefs without directional hypotheses.

The extant literature shows that a combination of worry about climate change and efficacy beliefs are key predictors of information seeking, policy support and pro-environmental behaviour and behaviour intentions (Bradley et al. 2020; Chu & Yang, 2020; Hart & Feldman, 2016; Hornsey et al., 2015; Mead et al., 2012; Milfont, 2012). Nevertheless, the exact relationships between climate science beliefs, worry about climate change, and efficacy beliefs are not well established. Some studies suggest that efficacy beliefs are an outcome of risk perceptions, concern or worry about climate change (Bradley et al., 2020; Hornsey et al., 2015; Milfont, 2012). Others, often building on the extended parallel process model (Witte, 1992), argue that efficacy beliefs form in parallel with perceptions of threat or risk and have independent and interaction effects on behaviour, attitudes and other responses to climate change (Chu & Yang, 2020; Hart & Feldman, 2016; Mead et al., 2012). We follow this line of thought and model efficacy beliefs as a parallel mediator between perceptions and outcomes.

POLICY SUPPORT AND INTENDED BEHAVIOUR CHANGE

While the original gateway belief model uses 'support for public action' as outcome measure, we instead look at intended behaviour change and policy support (for subsidies, taxes, and prohibitions) – both common in the literature on (consensus) message effects, perceived scientific agreement and climate science beliefs (cf. Cook, 2019; van der Linden, 2021). In high-consensus countries, the political and communication challenge no longer lies in garnering public support for the idea that climate change needs to be addressed. For instance, in Germany, the public discussion revolves around trying to agree on the right solutions to the problem (Tschötschel et al., 2020). The central challenge in many high-consensus countries is to move this discussion forward rather than generating general agreement that climate change needs public action. We expect our outcomes to be positively predicted by climate science beliefs and worry about climate change (hypothesis 6a/b and 7a/b) – in line with the original gateway belief model (van der Linden et al., 2015) – and by climate change efficacy beliefs (hypothesis 8a/b) – in line with the literature on efficacy beliefs and the extended parallel process model.

PRESENT STUDY

This study presents evidence from a conceptual replication of the gateway belief model (GBM) in Germany. Despite general support for further public action on climate change, the country struggles with the timely implementation of its 'Energiewende' energy transition (Quitzow et al., 2016) and lags behind its

emission-reduction goals. The country exhibits a robust public and political consensus on climate science (Poortinga et al., 2018), a historical track record of climate-friendly policies (Hake et al., 2015), and a public conversation about the issue focused on how to address mitigation and adaptation challenges (Tschötschel et al., 2020). We tested the predictions in line with our extended model in a pre-registered (https://osf. io/7wszt/) survey experiment (N = 1171) using a highly representative quota sample of the German population.

METHODS AND MATERIALS

Methodologically as well as theoretically, this study builds on the 'gateway belief model' (van der Linden et al., 2015), which we extended with a range of additional concepts allowing us to investigate hypotheses we deemed pertinent to the high-consensus context described. As our extended gateway belief model relies on abstract concepts with multiple dimensions, we decided to use a latent variable structural equation model to account for this complexity – a key departure from the work done by van der Linden et al. (2015, 2019). Given the survey's length and the pilot's results showing less variance than in the US, we found it not feasible to measure difference scores (pre- and post-treatment) but rely on post-treatment between-group comparisons only. In a final methodological departure from the work done by van der Linden et al. (2015) and van der Linden, Maibach et al. (2019), we made explicit to our respondents that the study aimed to investigate attitudes towards climate change (without revealing details about experimental treatments). Despite the differences to original gateway belief research (van der Linden et al., 2015, 2019), we argue that our work should be read as a conceptual replication of the original theoretical model[7] and a test of some extension hypotheses.

DESIGN AND PROCEDURE

We used a Bayesian design that builds on the advantages of this statistical paradigm. In contrast to frequentist null-hypothesis testing, the results of Bayesian parameter estimation do not depend on the stopping or testing intentions (Kruschke & Liddell, 2018), allowing researchers to leverage a sequential sampling (Schönbrodt

7 In addition, our survey experiment incorporated the original survey items, allowing us to run an additional statistical analysis using manifest path analysis only, corresponding more closely to the operationalisation used by van der Linden, Maibach et al. (2019). We report the methodological details and results of this analysis in Appendix 4D. Findings are in line with the results from the more elaborate analysis presented in the main text.

& Wagenmakers, 2018). Rather than distinguishing between evidence of an effect and the absence of evidence, Bayesian analysis allows designing a procedure differentiating directly between three states: evidence of a practically significant effect, evidence of its absence, and inconclusive (Kruschke, 2018). In a sequential design, researchers draw a first sample, analyse it and evaluate the state of the evidence. If the findings are not conclusive, the sample is extended by drawing more data from a population with the same characteristics, and the analysis is repeated with additional statistical power due to the enlarged sample size, thus yielding more precise estimates. This process continues until the evidence is deemed conclusive for or against the hypotheses of interest (or a cut-off point is reached). In line with this approach, we specified in advance under which conditions we deemed the evidence conclusive for or against our hypotheses and under which circumstance we would move on to additional treatment conditions. We pre-registered this procedure, our overall design, and our hypotheses of interest in an Open Science Foundation registry (https.//osf.io/7wszt/).

In a few instances, we needed to depart from our pre-registered analysis plan. First, we were able to extend our sample with additional respondents and adjusted our advancement and stopping rules to obtain a more balanced sample across conditions. Second, our measurement model excludes variable 'be_int_5' (wrongly depicted in the pre-registration documents but not used in the pilot either). Third, we now number hypotheses in line with the flow of this document, departing from the numbering presented in the analysis plan (still, all hypotheses are included). Fourth, hypothesis 1a (6b in the preregistration) now reads, 'Simple consensus messages have an effect on perceived scientific agreement' rather than 'on climate science beliefs' – an error in our pre-registration. As a final note, this article emphasises the 'extension model', but the 'replication model' was analysed as well, with results reported in Appendix 4D.

SURVEY, STIMULUS AND MEASURES

We conducted the survey experiment using Qualtrics software. After agreeing to an informed consent form, respondents answered a short array of demographic and political preference questions (full survey in Appendix 4A). Next, we presented our stimulus as introduction to the main survey, intending to hide the experimental manipulation from our participants. The stimulus (Table 4.1) consisted of four conditions and was shown on an otherwise empty screen. While very short, this brief statement aligns with the procedure described by van der Linden (2015) but could lead to relatively small observed effects (see 'Discussion' below). The political

cue conditions were filled with the name of a politician associated with the party the respondent ranked as most preferred and a policy cue in line with the party's program for the 'ingroup' condition. For the 'outgroup' condition, we selected the second-least preferred party and their policy position as cues, aiming to avoid this condition to be dominated by opposition to the 'Alternative für Deutschland', Germany's radical right-wing party, and the only one publicly denying the reality of climate change.

Table 4.1

Experimental condition stimuli

Condition	Message
Control	Over the past year, the media has reported frequently on the subject of climate change. In the following, we would like you to answer a few questions about this topic.
Simple Consensus	Over the past year, the media has reported frequently on the subject of climate change. For example, there has been an increasing number of news reports that '97% of climate scientists agree that man-made climate change is taking place'. In the following, we would like you to answer a few questions about this topic.
Political cue: ingroup and outgroup	Over the past year, the media has reported frequently on the subject of climate change. For example, [politician] was quoted as follows: '97% of climate scientists agree that man-made climate change is taking place, and that is why [policy statement]'. In the following, we would like you to answer a few questions about this topic.

Politician names and policy statements can be found in Appendix 4C

Following the stimulus, we first asked participants about their perceptions of scientific agreement on climate change, followed by questions about perceived political agreement, climate science beliefs, individual, collective and political efficacy beliefs, emotions about climate change, behavioural intentions, and policy support (in this order). Each of these concepts was measured using a battery of three or more questions (see Appendix 4C, Table 4 for factor loadings, and Appendix 4A for the survey items). Finally, respondents were debriefed and referred to the politician's and their party's energy-policy related websites, if applicable. The procedure and stimuli were reviewed by the University of Amsterdam's ethics board under reference 2020-PCJ-12458. Before proceeding to statistical analyses, we removed low-quality results ('speeders' and 'straightliners') from the sample and standardised all observed variables.

SAMPLE

Following a pilot (N = 100) with the same sample characteristics as the main study to test our survey and operationalisation, we utilised eight independent batches of samples of the German population provided by Dynata throughout the period October 19–30, 2020. The first three batches of data were sampled to empirically investigate the observed variable model (see Appendix 4D), and we turned our attention to the latent variable SEM model with an initial N = 477. Batches 1 through 5 were assigned randomly to control and consensus conditions, while subsequent batches were used for in- and outgroup conditions. For all batches, nationally representative quotas were set on age and gender (interlocking), region and educational attainment (non-interlocking). The characteristics of the obtained sample approximate population characteristics for age, gender, political leaning (left-right self-position) and party preferences. In addition, across conditions, the sample is roughly balanced on these characteristics as well (Table 4.2). Most variation between conditions exists in terms of the relative proportions of most preferred party indicated by the respondent. Notably, this variation is strongest between control and consensus conditions, which were sampled in the same batches with true randomised assignment and are unlikely to differ systematically.

Table 4.2

Population and sample characteristics

Variable		Population	Full Sample	Experimental Condition			
				Control	Consensus	Ingroup	Outgroup
Age[a]		44.5	49.1	49.1	48.7	50.0	48.5
% Men[b]		49.35	48.68	48.01	47.54	49.40	49.80
Political Leaning[c]		4.40	4.72	4.68	4.76	4.86	4.75
Party Preference (%)[d]	Die Linke	7	12.1	10.9	13.0	10.2	15.0
	Die Grünen	20	18.3	16.6	19.4	19.0	18.2
	SPD	17	16.4	17.9	15.1	18.1	13.8
	FDP	6	8.8	7.6	8.8	10.8	7.5
	CDU/ CSU	36	29.6	30.5	27.8	28.0	32.8
	AFD	10	14.8	16.6	15.9	13.9	12.7
Batches			—	1-4	1-4	5-7	8
N			1,171	302	284	332	253

a Statistisches Bundesamt Germany (Statistisches Bundesamt, 2020a), includes those under 18
b Statistisches Bundesamt Germany (Statistisches Bundesamt, 2020b)
c Mean on left-right self-position scale. Population data from the European Social Survey 2018 (European Social Survey, 2018)
d Face-to-face Poll by IfD Allensbach Oct 7-20 (Insitut für Demoskopie Allensbach, 2020). Pollsters include an 'Other' category for parties currently not in parliament, and different pollsters' results vary slightly throughout the period of investigation.

STATISTICAL ANALYSIS

All statistical analyses were carried out using the R statistical computing environment. The Bayesian structural equation model was run using the R package 'blavaan' (Merkle & Rosseel, 2018). The R scripts used for analysis are published together with the dataset on the Open Science Foundation repository associated with this publication. Bayesian estimation uses three inputs: first, the model specifying the relationships between the variables to be analysed. Second, the observed data used to estimate values for parameters used in the model. Third, the so-called 'priors' that specify current beliefs about the possible and likely values these parameters could have. In this study, we used priors derived from our pilot data, reflecting the notion that priors should express current knowledge. While the selection of priors can have a considerable impact on parameters estimated using Bayesian SEM, this is mainly the case in small-sample studies (Erp et al., 2018), unlike ours.

Before analysing the substantial results of the statistical modelling process, we checked for model convergence and stability (Schoot et al., 2020). Finally, we evaluated model fit using SEM fit measures adapted for Bayesian analysis (Garnier-Villarreal & Jorgensen, 2019) – Table 4.3 presents means and 95 % highest density (credible) intervals. We deem these fit indices to indicate sufficient fit for proceeding with a substantial analysis of model outcomes.

Table 4.3
Fit indices for Structural Equation Model

	RMSEA	$\hat{\Gamma}$	$\hat{\Gamma}_{adj}$	**CFI**	**TLI**	**NFI**
Mean	0.058	0.921	0.881	0.946	0.927	0.933
HDI	(0.057, 0.058)	(0.919, 0.923)	(0.879, 0.884)	(0.944, 0.947)	(0.925, 0.929)	(0.932, 0.934)

Point estimates and Bayesian posterior highest density intervals at the .95 level

Bayesian estimation results in a posterior 'sample' of possible parameters, with a distribution corresponding to the fit to the data the parameters would produce (i.e., the distribution density is highest around the parameters producing the best fit). This posterior can be used to calculate both point estimates (posterior means) and 'credible intervals', usually operationalised as the highest density interval of the posterior sample distribution (Kruschke, 2018). Both these serve for further analysis and interpretation, with the advantage that they express probabilities for the parameters given data and priors.

While the statistical analysis yields these estimates for all statistical model parameters, including factor loadings, intercepts, and residual variances and covariances (see Appendix 4C), we were mainly interested in the 'structural' part of the structural equation model, the estimated regression (and covariance) relationships between the latent variables and (manifest) worry at the 'core' of the model (see Figure 4.2). Taking inspiration from (Kruschke, 2018), we compare regression point estimates and credible intervals (HDI) to a 'region of posterior equivalence' (ROPE) to 0, which we define as the interval (– 0.1, 0.1). This procedure yields a heuristic to distinguish between evidence of an effect, inconclusive findings, and evidence for the absence of an effect.

We claim strong evidence of an effect if the HDI is entirely outside the ROPE

Evidence of an effect if the estimate is outside the ROPE, the HDI excludes 0, but the ROPE and HDI overlap

Inconclusive evidence if the HDI contains 0, but the estimate is outside the ROPE

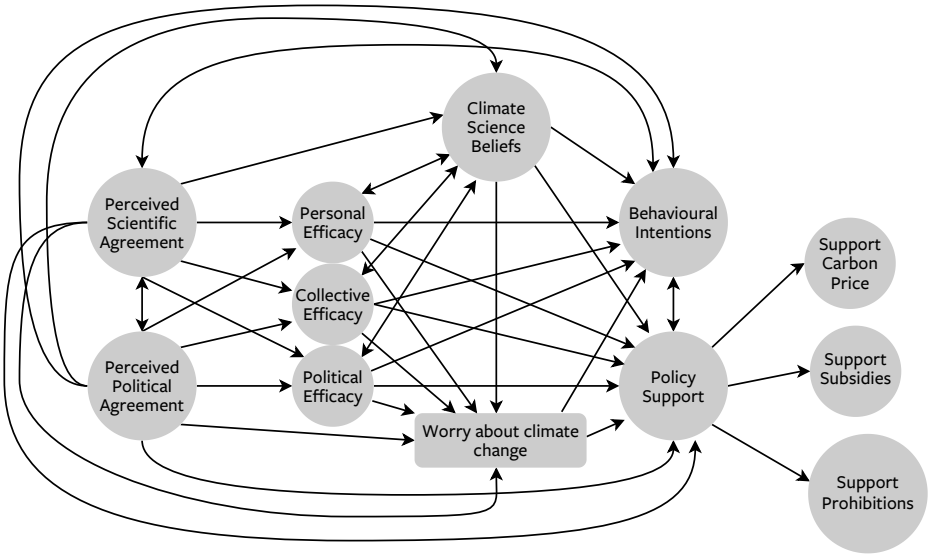
Evidence of no effect if ROPE contains the point estimate, but the HDI exceeds it

Strong evidence of no effect if the HDI is fully contained inside the ROPE

Arguably, these conditions put a strong requirement on finding an effect – very weak effects with good evidence do not qualify (e.g., an HDI ranging from 0.090 to 0.095), while these would likely yield statistically significant results when using frequentist statistics. However, we argue that the bar for finding effects should include an element of practical relevance (i.e., a certain magnitude). Nevertheless, we report all relevant point estimates and their HDIs and leave it to the reader to decide whether they agree with our interpretation.

Figure 4.2

Statistical model excluding latent variable measures



Note: residual covariances between efficacy variables are not depicted but estimated. Measurement model for latent variables and treatment regressions (on all latent variables and worry) not depicted.

RESULTS

CLIMATE CHANGE CONSENSUS TREATMENTS SHOW LITTLE EFFECTS

Next to a control condition, we exposed respondents to three different consensus messages about climate change (Table 4.2). The first, directly adapted from van der Linden et al. (2015), simply informs respondents that 'over the past year, media frequently report that "97 % of climate scientists agree that human-made climate change is taking place"'. Our data shows that this type of message is very unlikely to have substantially meaningful effects. Table 4.4 summarises observed means and standard deviations for key variables and experimental conditions (see Appendix 4B for a complete list). Note that the difference between 'control' and 'consensus' conditions for the 'perceived scientific agreement' variable is statistically significant, but small, $t(584) = 2.038$, $p = 0.04$, $d = 0.17$. The same applies for the difference between 'ingroup' and 'control' conditions, $t(632) = 2.593$, $p = 0.01$, $d = 0.21$. Both

these are considerably lower than the usual effect sizes reported in consensus messaging experiments – van der Linden, Maibach et al. (2019), for example, reports an effect size of d = 0.88.

Table 4.4

Means and standard deviations for key variables by experimental condition

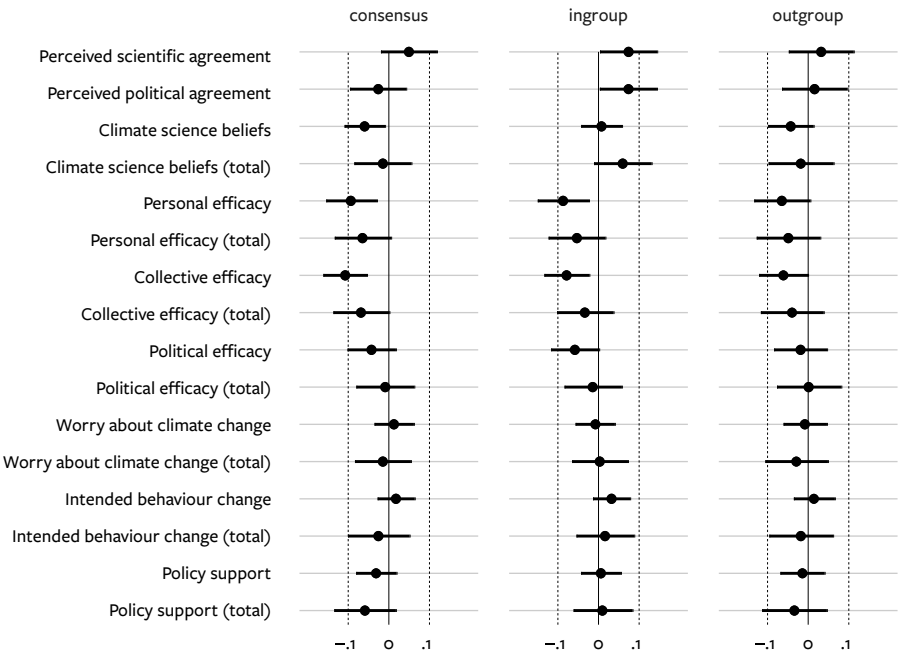
	Experimental Condition			
Variable	**Control**	**Consensus**	**Ingroup**	**Outgroup**
Perceived scientific agreement (psa_real 0-100)	71.13 (21.345)	75.48 (20.929)	73.47 (22.469)	74.84 (22.693)
Perceived political agreement (ppa_real 0-100)	63.81 (19.209)	65.76 (19.776)	64.27 (19.792)	64.51 (19.386)
Climate change is happening (csb_real 1-7)	5.44 (1.554)	5.6 (1.481)	5.38 (1.524)	5.39 (1.749)
Climate change human-made (csb_human 1-7)	5.81 (1.405)	5.87 (1.394)	5.72 (1.487)	5.86 (1.55)
Worried about climate change (cc_worry 1-7)	5.15 (1.633)	5.16 (1.528)	5.04 (1.651)	5.11 (1.698)
Support for public action (cc_action 1-7)	5.85 (1.238)	5.81 (1.35)	5.66 (1.379)	5.82 (1.483)
Mitigate climate change possible (eff_coll_1 1-7)	5.55 (1.408)	5.39 (1.544)	5.4 (1.533)	5.31 (1.689)
Climate-friendly behavior (be_int_1 1-7)	4.66 (1.973)	4.73 (1.845)	4.75 (1.834)	4.6 (1.93)
Support carbon price on fossil fuels (ps_tax_1 1-7)	4.36 (1.885)	4.27 (1.891)	4.14 (1.972)	4.29 (1.84)

Observed means and standard deviations. Full table in Appendix 4C. Survey questions in Appendix 4A.

Turning to the structural equation model, as shown in Figure 4.3 (and Appendix 4C, Table 1), effect estimates on perceived consensus and other variables are either close to 0 (or weakly negative). Given how well the German public is informed about climate change (Poortinga et al., 2018) and how little climate science is politicised in public discourse (Tschötschel et al., 2020), this is not entirely surprising.

Figure 4.3

Effects of consensus messages per treatment condition



Standardised regression coefficient point estimates and Bayesian credible intervals at the .95 level as horizontal lines. Vertical dashed lines indicate the (-0.1, 0.1) region of posterior equivalence to 0 (see methods section).

Our statistical analysis reveals weak evidence in contrast to hypothesis 1a: simple consensus messages have no or minimal effects on perceived scientific agreement (β = 0.05, 95 %, HDI = [-0.02, 0.12]). This is in line with Kobayashi (2018), who found no effects of consensus messages in a non-anglophone country (Japan), but in contrast with most other research on the gateway belief model and consensus messages in the anglophone context. However, we want to caution readers that the direction of effect is positive. Our argument is chiefly that this effect is likely to be very small and of little relevance after a single exposure. In contrast to perceived scientific agreement, we expected to find evidence for the absence of an effect of simple consensus messages on perceived political agreement, and our analysis confirms this hypothesis 1b (β = – 0.03, 95 %, HDI = [-0.10, 0.04]).

Second, we exposed respondents to the same message but attributed the consensus statement to a politician from the party favoured by the respondent and combined it with a policy cue reflecting its position. In contrast to research in the United States, showing 'ingroup messengers' and identity cues can enhance

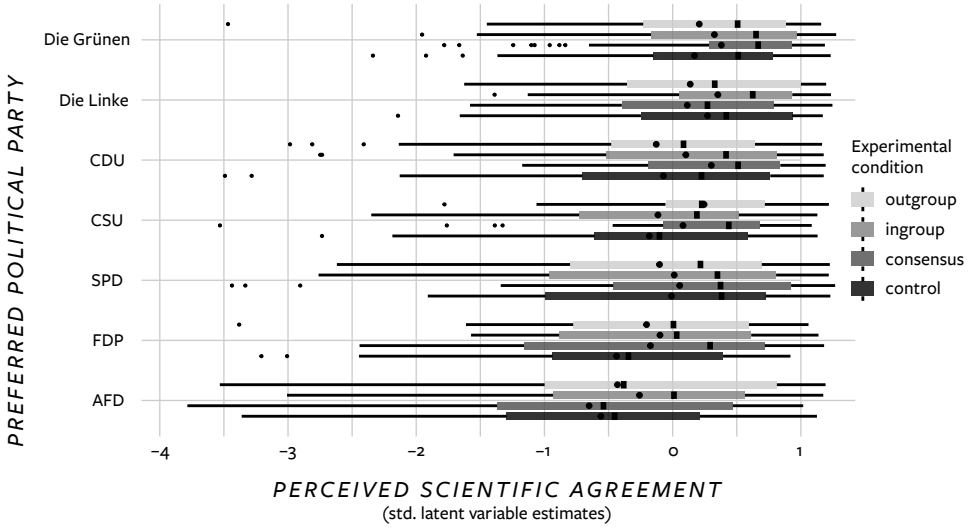
the effects of pro-environmental and pro-climate messages (Fielding et al., 2019; Goldberg, Gustafson et al., 2019; Hurst & Stern, 2020), our German data shows that the differences between apolitical consensus messages and those adding ingroup cues are close to zero. We find strong evidence contradicting hypothesis 2a: ingroup political cues do not boost the effects of consensus messages on perceived scientific agreement (β = 0.03, 95 %, HDI = [-0.05, 0.10]). On the other hand, our data are weak evidence for hypothesis 2b: using 'ingroup' political messengers (politicians affiliated with the respondent's preferred party) does seem to boost perceived political agreement (β = 0.1, 95 %, HDI = [0.02, 0.18])[8].

Finally, we tested the effects of political outgroup cues – using the same message, but this time with a politician and policy proposal from a party opposed by the respondent. In the extant literature, there is little and contradictory evidence about the effects of outgroup messaging. For instance, Australian political partisans responded to outgroup cues with lower levels of support for otherwise preferred policy options (Kousser & Tranter, 2018). On the other hand, in a recent experiment in the United States, conservative framing and messengers did not become less persuasive to liberal respondents (Hurst & Stern, 2020). Our data show that the effects of messages with outgroup cues are close to 0. We find strong evidence against hypothesis 3a – outgroup political cues do not boost the effects of consensus messages on perceived scientific agreement (β = – 0.02, 95 %, HDI = [-0.10, 0.06]) – and weak evidence against hypothesis 3b: outgroup cues do not dampen the effects of consensus messages on perceived political agreement (β = 0.04, 95 %, HDI = [-0.04, 0.12]).

8 Note that these estimates (and those in the following paragraph) use the "consensus" condition as comparison, while Figure 4.3 depicts differences to the control condition.

Figure 4.4

Boxplots of standardised latent variable point estimates of 'perceived scientific agreement' by political preference



Note: vertical lines in the box indicate median values, points indicate means. Box from 25% to 75% percentile, whiskers at Median +/- 1.5*IQR. Parties sorted by average perceived scientific agreement.

Overall, it appears that in the German high-consensus context with little political and public polarisation surrounding climate change, prior beliefs and attitudes towards climate change and climate policy are not susceptible to considerable change by exposure to simple text-based statements to possibly well-known scientific and political information about the issue. Whether the effects of consensus messages could be boosted, for example by using visual information, other enhancing strategies, or ingroup messengers other than political party members, remain open questions. An explorative look at the observed latent variable means by political preference (Figure 4.4) shows that the appropriate strategy might differ from party to party. For instance, for the far-right Alternative für Deutschland, the ingroup condition seems most promising, whilst many other respondents seem to prefer simple consensus messages (without political information), and some subgroups even showing signs backlash effects or reactance to some of the conditions.

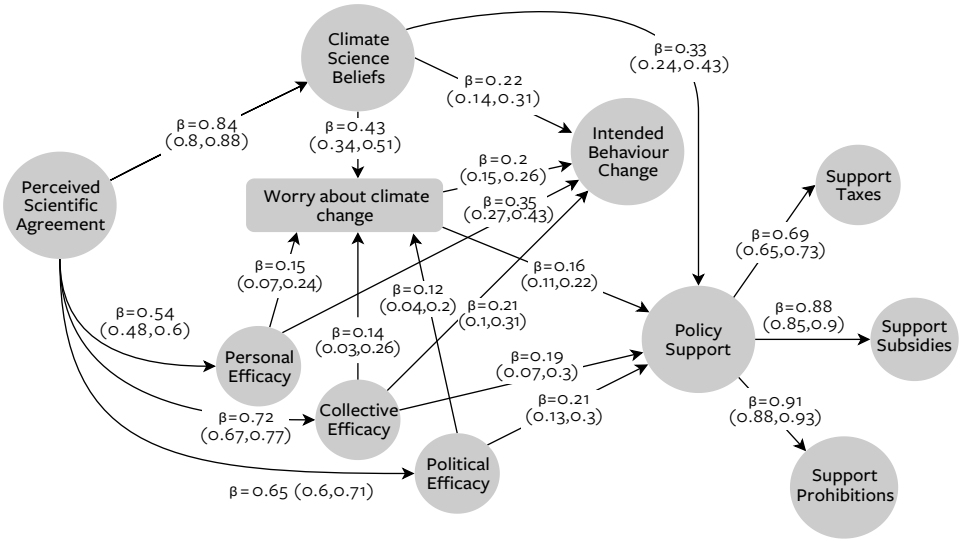
NO PARALLEL GATEWAY

The second core hypothesis of the gateway belief model states that the effects of consensus messages are fully mediated by 'perceived scientific agreement' in a first step and individual climate science beliefs and worry in a second mediation step (van der Linden et al., 2015). We complemented this notion by including perceived political agreement with climate science in the model, which we hypothesised to act as a parallel gateway predicting downstream variables, particularly efficacy beliefs. Following similar distinctions in the literature (Feldman & Hart, 2015; Verschoor et al., 2020), we differentiate between personal, collective, and political efficacy beliefs, each encompassing measures of self-efficacy and outcome expectancy (see Appendix 4A for survey items).

Our model estimates, presented in Figure 4.5 and Figure 4.6 (as well as Appendix 4C, Table 2), show relationships partly in agreement with, and partly contradicting our pre-registered hypotheses. On the one hand, perceived scientific agreement acts as expected and in line with prior research (van der Linden et al., 2015, 2019) by serving as a predictor of downstream variables. In line with our expectation (Hypothesis 4a), we find strong evidence that it is a predictor of climate science beliefs (β = 0.84, 95 % HDI = [0.80, 0.88], strong evidence). Yet in contrast to our hypothesis 4b, our analysis shows weak evidence that its effects on worry about climate change are fully mediated (βdirect = – 0.03, 95 % HDI = [-0.11, 0.06] and (βtotal = 0.59, 95 % HDI = [0.54, 0.69]). Next to climate science beliefs, efficacy beliefs play a substantial mediating role between perceived scientific agreement and worry (and other downstream variables). There is strong evidence that perceived scientific agreement predicts personal efficacy (β = 0.54, 95 % HDI = [0.48, 0.60]), collective efficacy (β = 0.72, 95 % HDI = [0.67, 0.77]), and political efficacy (β = 0.65, 95 % HDI = [0.60, 0.71]). Its relationship with intended behaviour change and policy support is fully mediated by these three variables.

Figure 4.5

Structural Equation Model regression results (variables with at least one non-zero coefficient path only)



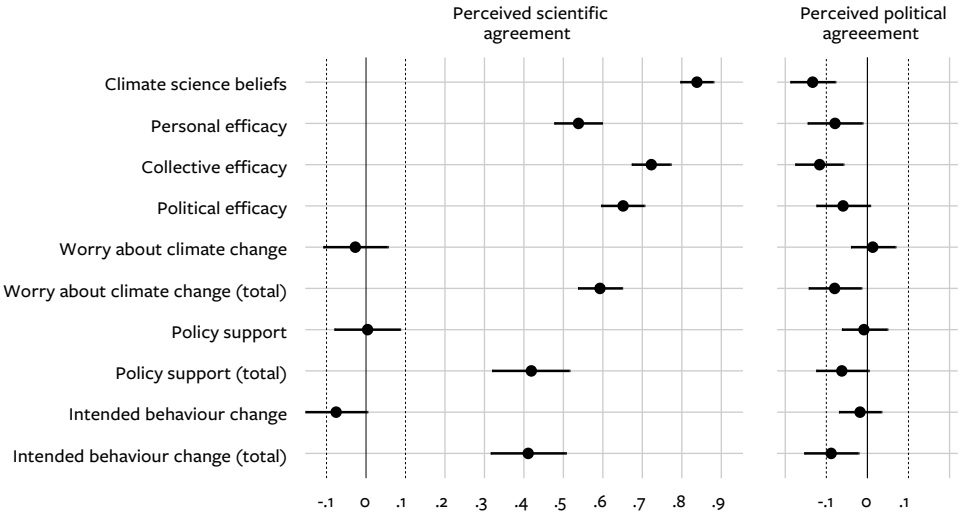
Note: standardised regression coefficient point estimates and Bayesian credible intervals at the .95 level. For ease of exposition, the following coefficients and variables are omitted: consensus treatment à collective efficacy β = -0.11 (-0.16,-0.05); perceived political agreement à climate science beliefs β = -0.13 (-0.19,-0.08); perceived political agreement à collective efficacy β = -0.12 (-0.18,-0.06).

On the other hand, perceived political agreement does not seem to play a role independently of perceived scientific agreement. In contrast to our hypothesis 5a, there is weak evidence that it is a negative predictor of climate science beliefs (β = – 0.12, 95 % HDI = [-0.19,-0.08]). Similarly, we find weak evidence that it does not predict personal efficacy beliefs (β = – 0.08, 95 % HDI = [-0.15,-0.01]) or political efficacy beliefs (β = – 0.06, 95 % HDI = [-0.12, 0.01]) and weak evidence that it predicts collective efficacy beliefs (β = – 0.12, 95% HDI = [-0.18,-0.06], weak evidence), in contradiction with our 'parallel gateway' theory (hypothesis 5b). These findings may seem somewhat paradoxical, but we believe that explanation can be found when considering the strong residual covariance between perceived political and scientific agreement, estimated at 0.59 (95 % HDI [0.55, 0.63], Appendix 4C, Table 5). It appears that variation in perceived scientific agreement can explain most of the variation of downstream variables and perceived political agreement. Consequently, for most respondents, higher values of perceived political agreement are indeed positively associated with downstream variables. What little independent

variation remains within perceived political agreement is, we think, mostly driven by a subgroup opposed to climate science and policy, thus producing the association. However, further research investigating such interactions is needed to explore this pattern, but beyond this article's scope.

Figure 4.6

Regressions from perceived scientific agreement and perceived political agreement predicting downstream variables



Standardised regression coefficient point estimates and Bayesian credible intervals at the .95 level as horizontal lines. Vertical dashed lines indicate the (-0.1, 0.1) region of posterior equivalence to 0 (see methods section).

BEHAVIOUR INTENTIONS, POLICY SUPPORT AND THEIR ANTECEDENTS

Turning, finally, to the intended outcomes of consensus messaging, our findings show the advantages of distinguishing between behaviour intentions and policy support on the one hand and between beliefs about climate science and different efficacy beliefs on the other (Figure 4.5 and 4.7). Confirming hypotheses 6a, 6b, 7a and 7b, we find strong evidence that beliefs about climate science serve as weak predictors of intended behaviour change (βtotal = 0.31, 95 % HDI = [0.23, 0.39]) and moderate predictors of policy support (βtotal = 0.4, 95 % HDI = [0.32, 0.49]). There is strong evidence that worry mediates this relationship (β = 0.43, 95 % HDI = [0.34, 0.51] and predicts intended behaviour change – it moderately predicts

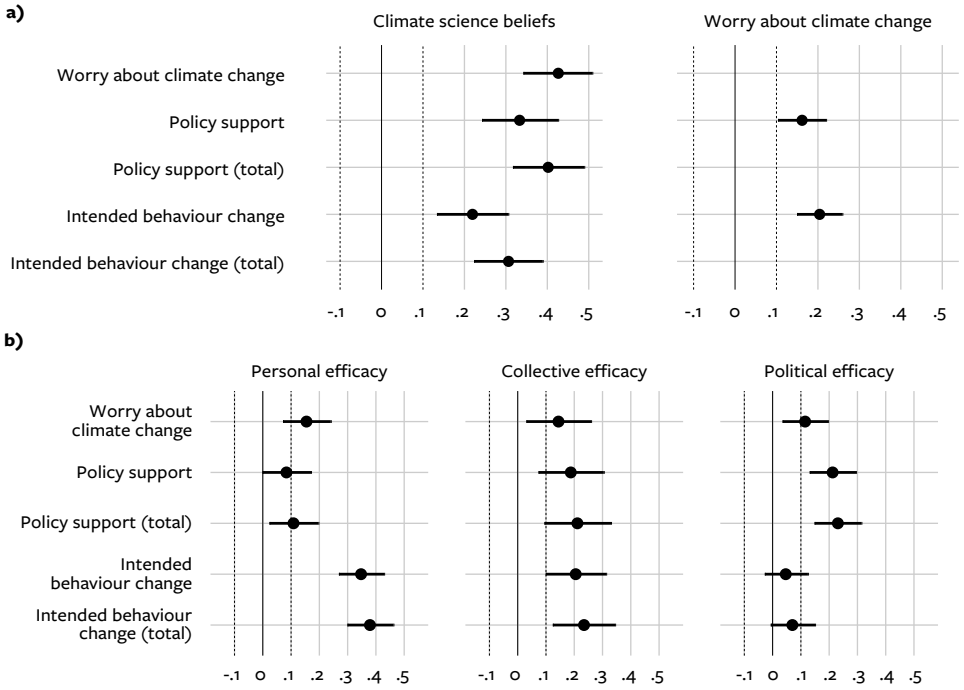
intended behaviour change (β = 0.2, 95 % HDI = [0.15, 0.26]) and weakly predicts policy support (β = 0.16, 95 % HDI = [0.11, 0.22]), in line with prior research on the gateway belief model (van der Linden, Leiserowitz et al., 2019).

Turning to efficacy beliefs, our findings show strong evidence that personal efficacy beliefs are moderate positive predictors of intended behaviour change (βtotal = 0.38, 95 % HDI = [0.30, 0.46]). In addition, there is weak evidence that they play a minor role in predicting policy support (βtotal = 0.11, 95 % HDI = [0.02, 0.20]). The reverse is true for political efficacy beliefs, with weak evidence that they do not predict intended behaviour change (βtotal = 0.07, 95 % HDI = [-0.01, 0.15]) but strong evidence that they moderately predict policy support (βtotal = 0.23, 95 % HDI = [0.15, 0.31]). Finally, we find strong evidence that collective efficacy beliefs act as moderate predictors for both (βtotal = 0.21 and 0.23, 95 % HDIs contained in = [0.10, 0.34]). Taken together, this is in line with our expectations that efficacy beliefs are a key factor in predicting policy support and intended behaviour change (Hypotheses 8a and 8b). These relationships are partially mediated by the weak positive association between efficacy beliefs and worry (weak evidence for all: average β = 0.14, all 95 %, HDIs contained in [0.03, 0.26]), meaning that there does not seem to be a trade-off between worry and efficacy.

To sum up, we see our results as evidence that climate science beliefs and efficacy beliefs do indeed appear to work in tandem, as suggested by the extended parallel process model (Witte, 1992). In addition, in contrast to the effects of consensus messages, the relationships between psychological constructs related to climate change appear to be invariant to the US and German context. Finally, worry can be a 'constructive' cognitive response to climate change (Verplanken et al., 2020), linked to political information seeking and learning (Yang et al., 2014).

Figure 4.7

Regressions from efficacy beliefs, climate science beliefs and worry about climate change to worry and outcome variables



DISCUSSION

On the one hand, our results show that most relationships between beliefs and attitudes concerning climate change and climate policy are roughly transferable between the US and Germany. On the other hand, text-based climate change consensus messages (with or without added political cues) do not appear to have considerable effects on policy support, intended behaviour change or any of the constructs measured in our study, including perceived scientific agreement. While some of the measured coefficients are positive and might be relevant when recipients are exposed repeatedly, we view our data and analysis as initial evidence that consensus messages are likely less relevant in the German context and countries like it. It is noteworthy that this is despite not exceptionally high levels of perceived

scientific agreement in the control group (M = 71.13, see Table 4.4). In our view, this indicates a kind of saturation effect, leading to audiences being largely unaffected by information they are relatively familiar with.

Our findings show, in our view, that climate change communication needs tailoring to the current state of the nationally specific conversation about climate change and adjustment to its specific aims and target groups. In Germany, and likely many other high-consensus countries with relatively widespread agreement on the need to fight climate change, the public conversation is relatively saturated with information regarding the topic. In this contemporary context, targeting perceived scientific agreement about climate change with the help of consensus messages may not lead to the desired goals of boosting policy support and intended behaviour change, despite it being a central 'gateway belief' (van der Linden, Leiserowitz et al., 2019). Targeting perceived scientific agreement using consensus messages may have had its time in the past, when public doubt about climate science was more widespread, or might find its use to repel future misinformation campaigns, in case they manage to sow doubt about the scientific consensus on human-made climate change. Similarly, as new areas of scientific consensus arise that might still be subject to public doubt (e.g., about the urgency of action), consensus messaging strategies may prove useful.

Strengthening public knowledge about climate science might also help achieve two goals in the current political and communication context. First, it could maintain the high levels of personal belief in climate science, for example if used in combination with inoculation strategies (Maertens et al., 2020). Second, targeting audiences susceptible to consensus messages might be fruitful (such as the 'moderate right) and using 'ingroup messengers' (Fielding et al., 2019) could, in some cases, assist in doing so. Yet, given that German media frequently report on different aspects of climate change, we believe that further research is needed on how to reach groups and individuals that have settled in their opposition to climate science and policy, even in light of overwhelming scientific, political, and public majorities that think otherwise.

The main communicative challenge in high-consensus countries seems to be finding ways to directly boost other predictors of policy support and intended behaviour change. To achieve this, the emphasis could lie on political initiatives and communication that supports perceptions of political efficacy while reinforcing individual climate science beliefs. Studies on the predictors of political climate change efficacy beliefs are rare, but Hart and Feldman (2014) note an absence of efficacy-oriented

messages in US news, a pattern that has not changed in recent years (Tschötschel et al., 2020). Current communication efforts and academic research often emphasise the many ways in which individuals can act, for example by changing their transportation and consumption behaviour. Considering our study's results, such efforts may be well-suited for promoting individual behaviour change by boosting personal efficacy beliefs but may have little effect on whether individuals support public policies on climate change.

Overall, policy interventions are potent levers to accelerate emissions reductions (Quéré et al., 2019) by influencing many of the conditions that shape individual behaviour and by triggering changes beyond the scope of individual action. Reporting on how policy can effectively combat climate change – a form of 'solutions journalism' (McIntyre, 2019) using explicit 'efficacy frames' (Feldman & Hart, 2015) could prove effective in this regard, and prominent examples show how the approach can be applied in a radio and podcasting format (BBC, n.d.; Gimlet Media, n.d.). However, specific evidence about the effects of climate change solutions journalism is lacking. Further studies on the drivers of political and collective climate change efficacy beliefs could prove crucial for promoting the public acceptance of policies and initiatives needed to achieve ambitious emissions reductions.

SCOPE & LIMITATIONS

We find it important to offer two notes about the scope and limitations of this study. First, we urge readers not to interpret our work as a clear-cut replication test of the original gateway belief model (van der Linden et al., 2015, 2019). Our analytical approach focused on post-treatment measures, in contrast to the originally used pre-post treatment difference measures (van der Linden, Leiserowitz et al., 2019). In addition, introducing the survey as a study of attitudes to climate change and media use may have cued respondents into existing attitudes, and some respondents may not have read the treatment text as carefully as in the original research, further dampening its effects. Still, we believe in having offered strong evidence that the (admittedly simple) consensus messages used here have little to no substantial effects in the German context[9], where climate protection is a politically salient topic.

9 As mentioned above, for better comparability, and following our pre- registration, we re-analysed the post-exposure scores found in the data used by van der Linden, Maibach et al. (2019), and used that information to build a post-exposure manifest variable model to provide a more direct replication test (Appendix 4D), which yields the same substantive conclusions.

Second, we believe to have added to the body of evidence that efficacy beliefs play an essential role in understanding the drivers of intended behaviour change and policy support. However, investigating how perceived scientific agreement, climate science beliefs and efficacy beliefs are causally related is beyond the scope of this study and requires further research.

Finally, our study was conducted in one country alone, and extrapolation to other cultural and political settings needs to be done with care. While many of the contextual factors are similar in other countries with the highest global per-capita emissions, even the fairly homogenous group of European countries has considerable variation in terms of political systems, the media environment and current beliefs and attitudes towards climate science and climate policy. Moreover, outside this group, the public conversation about climate change occurs in even more different political and cultural settings. Different issues, such as the question of how to achieve (sustainable) economic development and which countries should bear the costs of the economic transition to a global zero-emissions economy, may play a more critical role in certain circumstances. In this case, entirely different communication challenges may be at play and strategies different from those discussed in this paper may be needed.

CONCLUDING REMARKS

The results presented here show why extrapolating findings from one cultural context to another is difficult, even when they are reasonably similar on a surface level: while perceived scientific agreement is a key 'gateway', also in the German high-consensus context, the methods for its manipulation (consensus messages) are mostly ineffective. However, we caution communicators against abandoning the practice of consensus messaging altogether. While effects may be absent immediately after exposure, potential long-term effects, such as the 'inoculation' against future misinformation (Maertens et al., 2020), are just as important. In fact, it is possible that we are not finding effects due to the frequent exposure to this type of information. Nonetheless, we encourage a heightened focus by researchers and practitioners on how to boost efficacy beliefs directly. Our research confirms that personal efficacy is key to promoting pro-environmental behaviour, while political efficacy predicts policy support. To put it simply, mitigating climate change in a democratic society appears to need citizens convinced that their own and their elected officials' efforts are needed and effective. While consensus messages

might do the trick in some low-consensus countries like the US, how this can best be achieved across the globe is an open question that deserves more scientific attention.

DECLARATION OF INTEREST STATEMENT

The authors declare no conflicting interests.

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chapter 5

climate communication past the tipping point

CLIMATE COMMUNICATION PRACTICES RECONSIDERED

This dissertation aims to contribute to solving one of the biggest and most important puzzles of our era: how to get on the path towards a faster and more just transition to a society that is free of greenhouse gas emissions. In the introduction, I argued that communication in the public sphere about climate change plays a central role in liberal-democratic societies where political decisions derive their legitimacy from popular support. Building on this assertion, I developed a theoretical lens for evaluating public discourse in terms of three functional desiderata for the public sphere. Utilising this theoretical framework and building on the empirical insights I have presented in this dissertation, this concluding chapter discusses the prescriptive-pragmatic aspects of the guiding question of this dissertation: which aspects of the public conversation in the United States and Germany favour or hinder a faster and more just transition? And what needs to change to overcome the obstacles and keep moving the conversation forward?

As I tackle these questions, I build on the preceding chapters and the overall empirical conclusion presented at the end of the introduction. To briefly summarise, I argued that German public discourse about climate change has moved past a key 'social tipping point' (cf. Mahl et al., 2020; Moser & Dilling, 2007; Russill & Nyssa, 2009): the overwhelming majority of citizens no longer questions the need to phase out greenhouse gas emissions, and the mediatised public sphere is almost fully committed to finding ways to do so by mid-century (with the AfD being relatively marginalised in most media). I also argued that the public sphere in the United States, in contrast, is still on the cusp of a similar switch. While there are positive signs that the US is almost past the tipping point, influential political forces still fundamentally challenge a commitment to abandoning the emissions-based economic model within a meaningful time-frame. Consequently, the following sections aim to provide a discussion of what would need to happen to give the United States the final push, and what is next for past-the-tipping-point Germany.

While the German public sphere seems to have embraced the need for a transition, national efforts still fall short of bringing the country on to a path that phases out emissions over a time scale compatible with Paris Agreement goals. Neither has the country politically committed to more ambitious targets or to finance emission-reductions elsewhere at a scale necessary to shoulder its international 'fair share' (Carbon Action Tracker, 2021a). While overall support for emissions-reducing policies is at an all-time high (Mahl et al., 2020), I would argue that backing for a faster transition hinges on tackling social justice questions at the national

level – for example about how the economic burden of the transition is going to be distributed between regions, economic sectors, and social groups. Thus, while part of the argument presented below is geared towards deriving lessons from the German case that are applicable in the US and elsewhere, it also aims to offer a critical look at how future communication practices and strategies could move beyond the status quo and continue to drive the conversation forward in Germany and countries similar to it.

In the following section, I consider four aspects of public discourse about climate change: communication about science, the impact of climate change on humans, climate solutions, and climate politics. Reflecting on my empirical results, I draw conclusions relevant to these approaches, evaluating how they contribute to a functioning public discourse about climate change. I also discuss how they could be used to help 'tip over' countries at the cusp (such as the US) or to promote a faster and more just transition in countries which are already past the tipping point (such as Germany). The theoretical lens supporting this analysis are the three functional desiderata for the public sphere which I developed in the introduction. First, the public sphere should enable its participants to develop inter-subjective descriptive factual knowledge about themselves and their natural and social environments. Second, public conversations about the state of the world should enable the formation of prescriptive political views – attitudes and beliefs about how the world should be – that underpin processes of collective decision-making. Third, public discourse should allow groups and individuals to shape their collective identities, which can further or hinder compromise. Using these three functional desiderata as theoretical framework and the findings discussed in this dissertation as the empirical referent, I offer some recommendations for how the four communication strategies can be used to keep moving the conversation forward.

COMMUNICATING ABOUT CLIMATE SCIENCE

Public discourse about climate science primarily develops knowledge about what the geo-physical scientific basis of climate change is and how it comes about. An understanding of these phenomena seems to form a basis for the political view that climate change warrants public action. Belief in climate change is strongly associated with concern about the issue, support for mitigation and adaptation policies, intended behavioural change, and political engagement (Bergquist et al., 2021; Goldberg, Gustafson, Ballew et al., 2020; Lee et al., 2015). However, I would argue

that most people do not draw politically relevant conclusions directly from understanding climate science, but from a recognition of its impact on human societies and individuals (see below). Thus, communication about climate science is, in my view, primarily useful as a strategy to counter the strategic efforts of the organised denial of science and the climate counter-movement discussed in chapter 1.

Communicating about the scientific consensus is an important strategy to reach audiences that may be relatively uninformed and potentially in doubt about the solidity of scientific evidence (Linden, 2021), as is the case for considerable parts of the US population (Leiserowitz, Roser-Renouf et al., 2021). In a similar vein, science communication about climate change can serve as an important tool to correct misinformation about the issue or to 'inoculate' the public against disinformation campaigns (Maertens et al., 2020). However, as my research indicates (see chapter 4), in the past-the-tipping-point context of Germany communication about climate science may be limited to reinforcing existing beliefs and have little further impact on the vast majority of the population, and other research indicates that 'inoculation' strategies may do little in this (Schmid-Petri & Bürger, 2021). This is unsurprising, given that the key political and behavioural consequences of accepting climate change are already part of the political and public consensus (with the exception of the AfD and its supporters) as portrayed by media consumed across the political spectrum (see chapter 3). Put simply, since most people are strongly supportive of the policy measures and individual behavioural changes necessary to achieve emission-reduction goals, they no longer need convincing about the reliability of the scientific evidence underpinning the phenomenon of climate change. Finally, chapter 4 indicates that using political in-group messengers (see below) to reach the remaining minority of 10-15% that are sceptical about climate change (Beiser-McGrath & Bernauer, 2021; Metag et al., 2015), may be more useful than simple scientific consensus messaging.

Can communication about climate science do more to encourage political views that support a faster and more just transition? For instance, scientifically backed claims about the carbon budget that remains available if global warming is to be limited to 1.5 C may evoke a sense of urgency which could spur the political view that faster action is necessary on this issue. However, recent research indicates that emphasising urgency does not necessarily boost public support for ambitious and costly policies (Fesenfeld & Rinscheid, 2021). Notwithstanding these experimental short-term results, public discourse about climate science may have considerable effects in the medium- and long-term through "agenda setting" and "priming" (cf. Scheufele & Tewksbury, 2007) – if the issue is discussed frequently, citizens may

increasingly evaluate politicians in terms of their positions and performance with regard to climate change. In my view, the results of the 2019 European Parliamentary election in Germany can be read as an illustration of such mechanisms: following an upsurge of protest, media attention to climate change was at an all-time high (Mahl et al., 2020) and voters evaluated climate change as the most important issue for the first time just prior to the election (Forschungsgruppe Wahlen, n.d.). In addition, my research indicates that political parties were pressed to take a position on how they would respond to the issue in the run-up to the 2019 election (see chapter 4). Overall, I would argue that the shift in public opinion that accompanied the election was driven by frequent reports on climate change and the fact that German media tends to emphasise the need to reduce emissions and debates about which measures should be implemented (see chapter 3).

Finally, looking at public discourse about climate science as an element of the shaping of collective identities reveals a somewhat complex picture. On the one hand, research on 'consensus messages' (see chapters 1 and 4) indicates that communication about the science of climate change has the potential to depoliticise the issue (cf. Linden, 2021). In other words, it allows beliefs embracing anthropogenic climate change to become part of any political collective identity. On the other hand, when the messengers of science communication are met with "motivated reasoning" and "cultural cognition" (Hart et al., 2015; Hart & Nisbet, 2012; Newman et al., 2018), negative attitudes towards climate science may become entrenched in collective political identities. However, as chapter 4 indicates, this may be not a substantial problem – even in the United States, where identity polarisation is mainly a question of attitudes towards policies rather than towards science. In addition, while a considerable share of the US population is on the fence or doubtful about human-made climate change (Leiserowitz, Maibach, Rosenthal, Kotcher, Carman, Wang et al., 2021), policies designed to reduce emissions enjoy widespread support among US voters (Leiserowitz, Maibach, Rosenthal, Kotcher, Carman, Neyens et al., 2021).

Taken together, these considerations indicate that communication about climate science has limits when it comes to moving the US past the social tipping point and is unlikely to be particularly useful in facilitating a faster and more just transition in the past-the-tipping-point context. When science communication is used, for example, to reach doubtful audiences and prevent climate science from becoming a victim of identity politics, communication about climate science should, in my view, focus on using messengers perceived as apolitical by the audience, or those that are credibly associated with the (political) identity of the groups it seeks to

address (cf. Bayes et al., 2020; Fielding et al., 2019; Goldberg, Gustafson et al., 2019). The point here is not only that this strategy has the potential to boost the effect of the message, but also that it can reinforce a positive attitude towards climate change as an element of the identity of the messenger.

COMMUNICATING ABOUT IMPACTS ON HUMANS

A second strand of communication strategies and practices focuses on the impact of climate change on humans. In concrete terms, these are as varied as human life on this planet is, but in terms of developing knowledge to support a faster and more just transition two clusters are particularly important. First, communication about local impacts has been shown to support problem awareness and other outcomes, arguably by developing knowledge that makes climate change more tangible and psychologically proximate (Loy, 2018; Romsdahl et al., 2018). A noteworthy side effect of such communication is that it helps lay the factual groundwork for local adaptation measures. Thus, understanding the impacts of climate change on different parts of the political community helps to develop knowledge that serves as a fundament for the evaluation of mitigation and adaptation policies in social justice terms. Second, highlighting the ways in which climate change affects different people and communities across the globe provides the basis for forming political views on how national policies should address global responsibilities.

Communicating about the impacts of climate change on humans enables the formation of political views about whether policies adequately address the ways in which different groups are affected by climate change. For instance, portrayals of young activists and their self-presentation in the German case illustrate how the concerns of affected people can translate into political views that promote a faster and more just transition (see chapter 3). In addition, as my research shows, communication about the impacts of climate change on humans is a frequent feature of reporting in Germany but does not seem to undermine a public debate which is primarily geared towards finding solutions (see chapter 2). However, while calls for increased climate justice are frequent among young protesters (von Zabern & Tulloch, 2021), the extra-national groups most severely affected by climate change are not strongly represented by the most prominent political actors (see chapter 4). In order to promote a transition that takes the global climate justice dimension into account more explicitly, communicators could seek to address this lack of transnational representation.

Turning to the matter of collective identities, communicating about the impact on humans has considerable potential to promote engagement with climate change. For instance, if communication manages to highlight how climate change will affect people with identities usually relatively distant to the issue, it could mobilise hitherto largely disengaged populations (e.g., Goldberg, Gustafson et al., 2019). As an example, it could help address regional divides (Echavarren et al., 2019; Howe et al., 2015) by showing how climate change will have severe impacts on rural communities by worsening wildfires, droughts, and flooding. Communication that discusses impacts in different parts of the globe in order to promote the global justice dimensions of the issue can also benefit from using the tool of collective identities. Communication can, for instance, bridge the psychological distance created by physical separation by highlighting similarities in identity based on characteristics like religious belief or occupation (Loy, 2018).

Taking a step back, communication about the effects of climate change on humans is likely to continue to be an important aspect of public discourse about climate change. Simply put, whatever effects of climate change we are seeing today are only early warning signs of the much more drastic and severe repercussions that will characterise the rest of this century and pose tough challenges in terms of climate justice. To adequately respond to these developments, it will be necessary to adjust policies over the course of the coming decades. A public conversation that promotes the development of knowledge about the evolving impacts, as well as the formation of political views about who should be given priority when responding to them, will continue to be crucial, even in the past-the-tipping-point context that will hopefully continue to characterise the public spheres of most rich and industrialised democratic countries in the future.

COMMUNICATING ABOUT SOLUTIONS

A conversation about the different efforts to reduce emissions and adapt to climate change is a key part of the public discourse supporting a faster and more just transition. First and foremost, it helps develop knowledge about the efficacy and costs of various strategies and approaches, which is a prerequisite for subsequent decision-making. In doing so, communication about solutions builds on and extends public discourse about the impact of climate change on humans. On the one hand, different mitigation and adaptation strategies can alleviate or aggravate the consequences of climate change – for example, supporting farmers to switch

production practices may help them adjust to more frequent droughts and also reduce emissions from the agricultural sector. On the other hand, implementing solutions poses important questions in terms of social justice: who is going to carry the burden and who is going to reap the benefits of the transition to a zero-emissions society? Unsurprisingly, as discussed in chapter 2, German media frequently report on different public and private measures, evaluating whether they are necessary or sufficient to achieve emissions-reduction goals. To effectively reduce emissions at the rate necessary to stay within the Paris Agreement goals, individual, business, and governmental efforts need to go hand-in-hand. All these aspects thus play an important role in public discourse on how to fight and adapt to climate change.

When it comes to forming political views, communication about solutions faces two major pitfalls, as illustrated by my findings. First of all, an examination of reporting in Germany illustrates how treating individual-level measures as the subject matter of political debate can serve as a surrogate for an honest justice-oriented conversation (chapter 3). For instance, debates about whether meat-eating should be regulated or not may serve to evoke strong emotional reactions but hides the fact that an on-average reduction in meat consumption is virtually unavoidable (Hedenus et al., 2014). The debate is thus framed in primarily ideological terms, rather than focusing on the underlying question of social justice: how will the limited carbon budget available for agriculture impact the distribution of emissions-expensive goods? Conversely, when couched not in policy terms but rather as a conversation about personal and societal norms, the issue illustrates how a public conversation about an individual-level measure orients the public sphere towards the private realm (cf. Breese, 2011). It thus enables political actors to avert a conversation about the impacts of different policy measures by treating large-scale consumption patterns as solely the outcome of individual decisions.

The second major pitfall consists of a conversation that appears to discuss solutions, but does so mainly in overarching ideological terms, without offering actual information about the content of policy proposals or the scale of economic and behavioural changes at stake. The reporting by Fox News on the Green New Deal and the Democratic positions discussed in chapter 3 illustrates this danger: the policy package was mainly criticised as an attempt at making the US more 'socialist', for being extremely costly, and potentially for 'hurting the economy'. The German debate about taxes is similarly reductive: rather than discussing the distributional implications of different carbon pricing schemes and their potential offsets, the portrayals of this issue by the different parties focused on whether or not they

would embrace a tax. While such portrayals may facilitate a debate about overall policy stances that is enough to help voters make their choices, they miss a chance to debate the impacts of different policy proposals, both nationally and internationally, which could foster a justice-oriented conversation with some substance.

Nonetheless, in terms of shaping collective identities, a public conversation about individual-level and policy measures serves as an important conduit for integrating environmentally friendly behaviours and policy attitudes into a range of collective identities. The German case illustrates how integrating views about different policy solutions into political identities can be compatible with a strong commitment to reducing carbon emissions. In my view, the changes in German political identities across the political spectrum described in chapter 3 are an important requisite for making effective climate policy part of a shared political platform. In addition, the portrayals of the young protesters demonstrate the potential of a political identity that is independent of party lines. However, the US case, where fundamental policy opposition is arguably a part of portrayed Republican identity (see chapter 3), provides a cautionary tale. These differential developments are driven by differences in both political and media systems and reversing the deepening divides in the US (Dunlap et al., 2016) will be a major challenge to moving the US past the tipping point. Since the relatively climate-friendly attitudes held by many Republican voters (Leiserowitz, Maibach, Rosenthal, Kotcher, Carman, Neyens et al., 2021) are not prominently covered in US media, emphasising the former may be a promising way forward for actors seeking to promote political identities which are in line with action on climate change.

As the climate and its impact on humans continues to change, so will the different individual and political strategies needed in response. The conversation about solutions is thus unlikely to end in the near future. To actually provide a foundation for collective and political decision-making (and help individuals to decide how to change their behaviour), communication about solutions cannot afford to be distracted by ideological divisions. In addition, to address the social justice dimensions of climate change, communication needs to be sufficiently in-depth and offer citizens information about the likely impacts of different policies. Last but not least, the international justice dimension is often marginalised in the conversation about climate change, at least as analysed in this dissertation (see also von Zabern & Tulloch, 2021). In order to promote this aspect of the debate, more pressure could be put on political actors to embrace international commitments – such as

providing adequate climate finance – and publicly discuss them. This would help to develop knowledge about an issue that is rarely discussed, and also reinforce the need to act quickly to prevent accelerating damages abroad.

COMMUNICATING ABOUT CLIMATE POLITICS

Finally, communication about climate politics is key to moving from a conversation about solutions to putting them into practice. Crucially, it allows voters and political activists to develop knowledge about the different strategies advocated by political parties and factions to mitigate and adapt to climate change. The analysis presented in this dissertation highlights how, as in the pitfalls outlined above, the public conversation about climate politics can go astray by becoming mired in ideological debates and focusing on the "political game" (Aalberg et al., 2012). Both US and German news reporting on climate change frequently features political actors and their positions on a variety of issues (see chapter 2). However, a closer look at portrayals by different media outlets (chapter 3) reveals that, in the United States, the space of politically relevant knowledge is reduced to the question of which of the two sides is 'winning the political game' by enacting, blocking, or dismantling policies. In the German case, similar tendencies can be found among the media consumed more exclusively by left- or right-leaning audiences, but the multiparty political system limits the extent to which portrayals of political positions can be dichotomised into two camps. In addition, the wide consensus on the need to act means that reporting has to focus on other issues if it seeks to portray political conflict or controversy, thus driving the political conversation closer to the different solution-oriented strategies advocated for by different parties. Finally, portrayals of political actors beyond the party system can allow participants in public discourse to develop knowledge about the different ways in which they can influence politics (cf. Fiig, 2011). However, as chapter 3 illustrates, when media respond to protest and political activism by focusing on the disruption caused and by marginalising justice-oriented claims – applying the so-called 'protest paradigm' (cf. von Zabern & Tulloch, 2021) – the opportunity to do so is lost.

How does communication about climate politics promote developing political views in favour of a faster and more just transition – i.e., views about preferred solutions and the political actors representing these preferences? Simply talking about climate politics in terms of who supports which policy – through the aforementioned mechanisms of agenda setting and priming (cf. Scheufele & Tewksbury,

2007) – can create the impression that one should have an opinion about which stance one takes on the issue. In addition, a public conversation about climate politics can emphasise how different political actors seek to address the social justice challenges that climate change and emissions reduction poses. In other words, as discussed in chapter 2, a "differentiated politicisation" of climate change begets opinion-formation about these highly relevant subjects (cf. Pepermans & Maeseele, 2016), and is distinct from the much lamented "politicisation of science" (Bolsen & Druckman, 2015; Schmid-Petri, 2017). The crux here is that public discourse would need to focus on discussing the policy options presented by different political actors, and whose interests these actors represent. The alternative which is now sometimes on display in US and German public discourse – claiming that policies can be directly derived from climate science – ignores the questions of justice which are at stake in the search for political agreement about solutions. Equally, opposition to policies can no longer be reduced to climate denialism or ignorance (cf. chapter 3) but should be read as legitimate interest-based claims that can be discussed from the angle of climate justice.

Public discourse about climate politics arguably promotes further integration of the issue of climate change into collective political identities. Chapter 3 illustrates how this can be either a boon or a bane to the promotion of a faster and more just transition. On one hand, when climate-friendly policies are framed as ideologically incompatible with a political identity – as portrayals of Republican politicians in both Fox News and Huffington Post tend to emphasise – opposition appears to be so fundamentally ingrained that striking a political compromise is impossible. On the other hand, German political identities across the board (with the exception of the AfD) integrate the need to act on climate change and are differentiated primarily according to whose interests should be given priority when shaping the transition. This lays the groundwork for political compromise and fundamentally changes the context for communication strategies. chapter 4 illustrates that political identity cues do not considerably enhance or diminish the effects of consensus messages in Germany, in contrast to the United States (Bolsen & Druckman, 2017). Communication can thus highlight political controversies – which may bring about additional engagement when elections are approaching (cf. Schuck et al., 2016) – without risking undermining overall public acceptance of climate science. Finally, in this context, political activism no longer needs to address fundamental opposition. Instead, it can focus on pointing out that decisions are not taken fast enough, do not go far enough, or prioritise the wrong interests – i.e., activism can concentrate on promoting a conversation about a faster and more just transition.

In summary, the political dimensions of climate change cannot be ignored, and information about climate politics underpins political decision-making. The challenge for communication strategy lies in not falling into the trap of focusing on the political or reporting on climate activism through the lens of the protest paradigm. When these pitfalls are navigated well, I would argue that a focus on climate politics has the potential to sustain the long-term engagement with climate change which is needed in order to push for a faster and more just transition. Ultimately, communication about climate science, the impacts of climate change on different populations and communities, the solutions needed to address the issue and the politics of deciding which of these are appropriate, will have to go hand-in-hand.

CONCLUDING REMARKS

Fighting climate change and navigating its impacts are the defining social and political challenges of this era. Meeting them requires a well-functioning public sphere and up-to-date climate communication strategies and practices. In the previous sections, I discussed multiple ways how communicators could respond to the empirical insights I have presented in this dissertation. My recommendations build on the finding that the German public sphere has moved past the social tipping point in its conversation about climate change, while the United States is likely on the cusp of doing so. Although my discussion is strongly oriented towards these two cases, I would argue that many of my arguments are also applicable in other countries and hold more general lessons for the future of public discourse about climate change.

National idiosyncrasies matter a great deal with respect to climate politics, and each country has quite unique combinations of media systems, party landscapes, and economic background conditions. Nonetheless, I would argue that using the mental image of the social tipping point in the public sphere helps to orient overall communication strategies independently of these national peculiarities. For instance, while the United Kingdom is one of the 'anomalous anglophones' (Smith & Mayer, 2019), and has a majoritarian electoral system more akin to the United States than most of its European neighbours, public opinion strongly supports emission-reduction goals (Flynn et al., 2021) and the country officially embraces a 2030 reductions target more ambitious than that of Germany (Carbon Action Tracker, 2021b). Arguably, the UK public sphere can be viewed as having 'tipped over' in a way similar to its German counterpart, and the conversation could now

focus on debates about who will carry the economic burden of the transition to come. As more and more countries embrace the Paris Agreement goals, the past-the-tipping point context is going to become the norm rather than the exception.

Independently of how national and global public discourse about climate change develops, the reality of the phenomenon will keep challenging societies with a continuously worsening situation until at least the second half of this century. Consequently, conversations about the impacts of climate change on humans across the globe will not subside in the near future, and it will be key to carefully protect factual knowledge about these matters from politicised controversies. Conversely, public and political debates about which solutions to implement are also unlikely to end within the next few years, but controversy around these inherently political questions can be used to maintain the high levels of engagement with the issue that facilitated recent political advances. Climate change and the politics surrounding the issue are going to be a constant accompaniment of the public sphere in the next decades, and in many ways the current period is likely to be a phase of learning about the political and communicative challenges we will increasingly have to contend with.

Consequently, the lessons I have outlined above will be relevant for a considerable amount of time. The need to connect conversations about the impacts of climate change with public discourse about how policies seek to address justice challenges will, in my view, continue to be at the centre of promoting a faster and more just transition. Likewise, climate politics – which deals with questions about the representation of different groups and interests and which solutions they advocate for – will continue to be at the heart of the search for workable compromises to deal with the new challenges posed by climate change and societal developments. The current period is thus a vital training ground for practising the past-the-tipping-point conversations we are going to continue to have over the coming decades.

REFERENCES

Aalberg, T., Strömbäck, J., & Vreese, C. H. de. (2012). The framing of politics as strategy and game: A review of concepts, operationalizations and key findings. Journalism: Theory, Practice & Criticism, 13(2), 162-178. *https://doi.org/10.1177/1464884911427799*

Adam, S., Häussler, T., Schmid-Petri, H., & Reber, U. (2019). Coalitions and counter-coalitions in online contestation: An analysis of the German and British climate change debate. New Media & Society, 21(11–12), 2671–2690. *https://doi.org/10.1177/14614448198559 66*

Ahler, D. J. (2014). Self-Fulfilling Misperceptions of Public Polarization. The Journal of Politics, 76(3), 607–620. *https://doi.org/10.1017/ 022381614000085*

Allgaier, J. (2020). Rezo and German Climate Change Policy The Influence of Networked Expertise on YouTube and Beyond.pdf. Media and Communication, 8(2), 376–386. *https://doi.org/10.17645/mac.v8i2.2862*

Båtstrand, S. (2015). More than Markets: A Comparative Study of Nine Conservative Parties on Climate Change. Politics & Policy, 43(4), 538–561. *https://doi.org/10.1111/polp.12122*

Ballew, M. T., Pearson, A. R., Goldberg, M. H., Rosenthal, S. A., & Leiserowitz, A. (2020). Does socioeconomic status moderate the political divide on climate change? The roles of education, income, and individualism. Global Environmental Change, 60, 102024. *https://doi.org/10.1016/j.gloenvcha.2019.102024*

Ballew, M. T., Rosenthal, S. A., Goldberg, M. H., Gustafson, A., Kotcher, J. E., Maibach, E. W., & Leiserowitz, A. (2020). Beliefs about others' global warming beliefs: The role of party affiliation and opinion deviance. Journal of Environmental Psychology, 70, 101466. *https://doi.org/10.1016/j.jenvp.2020.101466*

Barkemeyer, R., Figge, F., Hoepner, A., Holt, D., Kraak, J. M., & Yu, P.-S. (2017). Media coverage of climate change: An international comparison. Environment and Planning C: Politics and Space, 35(6), 1029–1054. *http://doi.org/10.1177/0263774X16680818*

Bartholomé, G., Lecheler, S., & de Vreese, C. (2015). Manufacturing Conflict? How Journalists Intervene in the Conflict Frame Building Process. The International Journal of Press/Politics, 20(4), 438–457. *http://doi.org/10.1177/1940161215595514*

Bayes, R., Bolsen, T., & Druckman, J. N. (2020). A Research Agenda for Climate Change Communication and Public Opinion: The Role of Scientific Consensus Messaging and Beyond. Environmental Communication. *https://doi.org/10.1080/17524032.2020.1805343*

BBC. (n.d.). The Climate Question. Retrieved February 26, 2021, from *bbc.co.uk: https://www.bbc.co.uk/programmes/w13xtvb6*

Beck, U., & Sznaider, N. (2010). Unpacking cosmopolitanism for the social sciences: a research agenda. The British Journal of Sociology, 61(61), 381-403. *https://doi.org/10.1111/j.1468-4446.2009.01250.x*

Beiser-McGrath, L. F., & Bernauer, T. (2021). Current surveys may underestimate climate change skepticism evidence from list experiments in Germany and the USA. PLOS ONE, 16(7), e0251034. *https://doi.org/10.1371/journal.pone.0251034*

Benegal, S. D., & Scruggs, L. A. (2018). Correcting misinformation about climate change: the impact of partisanship in an experimental setting. Climatic Change, 76(3), 607-20. *https://doi.org/10.1007/s10584-018-2192-4*

Bennett, W. L. (1996). An introduction to journalism norms and representations of politics. Political Communication, 13(4), 373 384. *https://doi.org/10.1080/10584609.1996.9963126*

Benwell, B., & Stokoe, E. (2006). Discourse and identity. Edinburgh, UK: Edinburgh University Press.

Bergquist, M., Nilsson, A., Harring, N., & Jagers, S. (2021). Determinants for Accepting Climate Change Mitigation Policies: A Meta-Analysis. Preprint published on Researchsquare. *https://doi.org/10.21203/rs.3.rs-333840/v1*

Bernstein, R. J. (2012). The Normative Core of the Public Sphere. Political Theory, 40(6), 767–778. *https://doi.org/10.1177/0090591712457666*

Bliuc, A.-M., McGarty, C., Thomas, E. F., Lala, G., Berndsen, M., & Misajon, R. (2015). Public division about climate change rooted in conflicting socio-political identities. Nature Climate Change, 5(3), 226-229. *https://doi.org/10.1038/nclimate2507*

Bolsen, T., & Druckman, J. N. (2015). Counteracting the Politicization of Science. Journal of Communication, 65(5), 745–769. *https://doi.org/10.1111/jcom.12171*

Bolsen, T., & Druckman, J. N. (2017). Do partisanship and politicization undermine the impact of a scientific consensus message about climate change? Group Processes & Intergroup Relations, 21(3), 389–402. *https://doi.org/10.1177/1368430217737855*

Bolsen, T., Palm, R., & Kingsland, J. T. (2019). The Impact of Message Source on the Effectiveness of Communications About Climate Change. Science Communication, 41(4), 464–487. *https://doi.org/10.1177/1075547019863154*

Bolsen, T., & Shapiro, M. A. (2017). The US News Media, Polarisation on Climate Change, and Pathways to Effective Communication. Environmental Communication, 12(2), 149-163. *https://doi.org/10.1080/17524032.2017.1397039*

Bostrom, A., Hayes, A. L., & Crosman, K. M. (2019). Efficacy, Action, and Support for Reducing Climate Change Risks. Risk Analysis, 39(4), 805–828. *https://doi.org/10.1111/risa.13210*

Boykoff, M. T. (2008). The cultural politics of climate change discourse in UK tabloids. Political Geography, 27(5), 549-569. *https://doi.org/10.1016/j.polgeo.2008.05.002*

Boykoff, M. T., & Boykoff, J. M. (2004). Balance as bias: global warming and the US prestige press. Global Environmental Change, 14(2), 125–136. *http://doi.org/10.1016/j.gloenvcha.2003.10.001*

Bradley, G. L., Babutsidze, Z., Chai, A., & Reser, J. P. (2020). The role of climate change risk perception, response efficacy, and psychological adaptation in pro-environmental behavior: A two nation study. Journal of Environmental Psychology, 68, 101410. *https://doi.org/10.1016/j.jenvp.2020.101410*

Brants, K., & van Praag, P. (2017). Beyond Media Logic. Journalism Studies, 18(4), 395–408. *http://doi.org/10.1080/1461670X.2015.1065200*

Breese, E. B. (2011). Mapping the Variety of Public Spheres. Communication Theory, 21(2), 130-149. *https://doi.org/10.1111/j.1468-2885.2011.01379.x*

Brown, R. (2020). The social identity approach: Appraising the Tajfellian legacy. British Journal of Social Psychology, 59(1), 5–25. *https://doi.org/10.1111/bjso.12349*

Brüggemann, M., & Engesser, S. (2017). Beyond false balance: How interpretive journalism shapes media coverage of climate change. Global Environmental Change, 42, 58-67. *https://doi.org/10.1016/j.gloenvcha.2016.11.004*

Brüggemann, M., Engesser, S., Büchel, F., Humprecht, E., & Castro, L. (2014). Hallin and Mancini Revisited: Four Empirical Types of Western Media Systems. Journal of Communication, 64(6), 1037–1065. *https://doi.org/10.1111/jcom.12127*

Brulle, R. J. (2014). Institutionalizing delay: foundation funding and the creation of U.S. climate change counter-movement organizations. Climatic Change, 122(4), 681–694. *https://doi.org/10.1007/s10584-013-1018-7*

Bundesverfassungsgericht. (2021, April 29). Verfassungsbeschwerden gegen das Klimaschutzgesetz teilweise erfolgreich. *https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/DE/2021/bvg21-031.html*

Busch, T., & Judick, L. (2021). Climate change—that is not real! A comparative analysis of climate-sceptic think tanks in the USA and Germany. Climatic Change, 164, 18. *https://doi.org/10.1007/s10584-021-02962-z*

Calhoun, C. (2002). Imagining Solidarity: Cosmopolitanism, Constitutional Patriotism, and the Public Sphere. Public Culture, 14(1), 147–171. *https://doi.org/10.1215/08992363-14-1-147*

Carbon Action Tracker. (2021a). Germany (Sep 15, 2021 Update). *https://climateactiontracker.org/countries/germany/*. Accessed on October 25, 2021.

Carbon Action Tracker. (2021b). United Kingdom (Sep 15, 2021 Update). *https://climateactiontracker.org/countries/uk/*. Accessed on October 25, 2021.

Carvalho, A., Wessel, M. van, & Maeseele, P. (2017). Communication Practices and Political Engagement with Climate Change: A Research Agenda. Environmental Communication, 11(1), 122-135. *https://doi.org/10.1080/17524032.2016.1241815*

Chinn, S., & Hart, P. S. (2021). Climate Change Consensus Messages Cause Reactance. Environmental Communication, 1–9. *https://doi.org/10.1080/17524032.2021.1910530*

Chinn, S., Hart, P. S., & Soroka, S. (2020). Politicization and Polarization in Climate Change News Content, 1985-2017. Science Communication, 42(1), 112–129. *https://doi.org/10.1177/1075547019900290*

Chinn, S., Lane, D. S., & Hart, P. S. (2018). In consensus we trust? Persuasive effects of scientific consensus communication. Public Understanding of Science, 38(4), 096366251879109–17. *http://doi.org/10.1177/0963662518791094*

Choi, S., & Hart, P. S. (2021). The influence of different efficacy constructs on energy conservation intentions and climate change policy support. Journal of Environmental Psychology, 75, 101618. *https://doi.org/10.1016/j.jenvp.2021.101618*

Chong, D., & Druckman, J. N. (2007). Framing Theory. Annual Review of Political Science, 10(1), 103-126. *https://doi.org/10.1146/annurev.polisci.10.072805.103054*

Chu, H., & Yang, J. Z. (2020). Risk or Efficacy? How Psychological Distance Influences Climate Change Engagement. Risk Analysis, 40(4), 758-769. *https://doi.org/10.1111/risa.13446*

Clark, A., Justwan, F., Carlisle, J. E., & Clark, M. (2019). Polarization politics and hopes for a green agenda in the United States. Environmental Politics, 29(4), 1–27. *https://doi.org/10.1080/09644016.2019.1654238*

Cook, J. (2019). The consensus on consensus messaging. Retrieved May 31, 2021 from *https://skepticalscience.com/consensus-consensus-messaging.html*

Cook, J., Oreskes, N., Doran, P. T., Anderegg, W. R. L., Verheggen, B., Maibach, E. W., ... Rice, K. (2016). Consensus on consensus: a synthesis of consensus estimates on human-caused global warming. Environmental Research Letters, 11(4), 048002. *https://doi.org/10.1088/1748-9326/11/4/048002*

Corry, O., & Jørgensen, D. (2015). Beyond 'deniers' and 'believers': Towards a map of the politics of climate change. Global Environmental Change, 32, 165–174. *http://doi.org/10.1016/j.gloenvcha.2015.01.006*

Czarnek, G., Kossowska, M., & Szwed, P. (2020). Right-wing ideology reduces the effects of education on climate change beliefs in more developed countries. Nature Climate Change, 11, 9-13. *https://doi.org/10.1038/s41558-020-00930-6*

Dahlberg, L. (2014). The Habermasian Public Sphere and Exclusion: An Engagement with Poststructuralist-Influenced Critics. Communication Theory, 24(1), 21–41. *https://doi.org/10.1111/comt.12010*

Dahlberg, L. (2016). Rethinking the fragmentation of the cyber-public: from consensus to contestation. New Media & Society, 9(5), 827-847. *https://doi.org/10.1177/1461444807081228*

Deutscher Bundestag. (June 24, 2021). Bundestag verschärft das Klimaschutzgesetz. *https://www.bundestag.de/dokumente/textarchiv/2021/kw25-de-klimaschutzgesetz-846922*. Accessed on October 25, 2021.

Ding, D., Maibach, E. W., Zhao, X., Roser-Renouf, C., & Leiserowitz, A. (2011). Support for climate policy and societal action are linked to perceptions about scientific agreement. Nature Climate Change, 1(9), 462–466. *https://doi.org/10.1038/nclimate1295*

Dixon, G., Hmielowski, J., & Ma, Y. (2019). More Evidence of Psychological Reactance to Consensus Messaging: A Response to van der Linden, Maibach, and Leiserowitz (2019). Environmental Communication. *https://doi.org/10.1080/17524032.2019.1671472*

Downs, A. (1972). Up and down with ecology. The Public Interest, 28, 38–51.

Druckman, J. N., & McGrath, M. C. (2019). The evidence for motivated reasoning in climate change preference formation. Nature Climate Change, 9(2), 111–119. *https://doi.org/10.1038/s41558-018-0360-1*

Dunlap, R. E., & McCright, A. M. (2011). Organized Climate Change Denial. In J. S. Dryzek, R. B. Norgaard, & D. Schlosberg (Eds.), The Oxford Handbook of Climate Change and Society. Oxford University Press. *https://doi.org/10.1093/oxfordhb/9780199566600.003.0010*

Dunlap, R. E., McCright, A. M., & Yarosh, J. H. (2016). The Political Divide on Climate Change: Partisan Polarization Widens in the U.S. Environment: Science and Policy for Sustainable Development, 58(5), 4–23. *https://doi.org/10.1080/00139157.2016.1208995*

Echavarren, J. M., Balžekienė, A., & Telešienė, A. (2019). Multilevel analysis of climate change risk perception in Europe: Natural hazards, political contexts and mediating individual effects. Safety Science, 120, 813–823. *https://doi.org/10.1016/j.ssci.2019.08.024*

Ehret, P. J., Boven, L. V., & Sherman, D. K. (2018). Partisan Barriers to Bipartisanship. Social Psychological and Personality Science, 9(3), 308–318. *https://doi.org/10.1177/1948550618758709*

Ellemers, N., Spears, R., & Doosje, B. (2002). Self and Social Identity. Annual Review of Psychology, 53(1), 161–186. *https://doi.org/10.1146/annurev.psych.53.100901.135228*

Erp, van, Mulder, J., & Oberski, D. L. (2018). Prior Sensitivity Analysis in Default Bayesian Structural Equation Modeling. Psychological Methods, 23(2), 363–388. *https://doi.org/10.1037/met0000162*

Esser, F., & Hanitzsch, T. (2012). On the why and how of comparative inquiry in communication studies. In F. Esser & T. Hanitzsch (Eds.), The Handbook of Comparative Communication Research (pp. 3–22). London, UK. *http://doi.org/10.5167/uzh-76156*

European Commission. (2019). Special Eurobarometer 490: Climate Change. Brussels: European Commission.

European Social Survey. (2018). ESS Round 9: European Social Survey Round 9 Data (2018). Norway: NSD - Norwegian Centre for Research Data – Data Archive and distributor of ESS data for ESS ERIC. Retrieved from NSD - Norwegian Centre for Research Data – Data Archive and distributor of ESS data for ESS ERIC. website: *https://doi.org/10.21338/NSD-ESS9-2018*

Farstad, F. M. (2017). What explains variation in parties' climate change salience? Party Politics, 24(6), 698–707. *https://doi.org/10.1177/1354068817693473*

Feldman, L., & Hart, P. S. (2015). Using Political Efficacy Messages to Increase Climate Activism. Science Communication, 38(1), 99 127. *https://doi.org/10.1177/1075547015617941*

Feldman, L., & Hart, P. S. (2018). Climate change as a polarizing cue: Framing effects on public support for low-carbon energy policies. Global Environmental Change, 51, 54–66. *http://doi.org/10.1016/j.gloenvcha.2018.05.004*

Feldman, L., Hart, P. S., & Milosevic, T. (2015). Polarizing news? Representations of threat and efficacy in leading US newspapers' coverage of climate change. Public Understanding of Science, 26(4), 481-497. *https://doi.org/10.1177/0963662515595348*

Feldman, L., Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. (2011). Climate on Cable. The International Journal of Press/ Politics, 17(1), 3-31. *https://doi.org/10.1177/1940161211425410*

Feldman, L., Myers, T. A., Hmielowski, J. D., & Leiserowitz, A. (2014). The Mutual Reinforcement of Media Selectivity and Effects: Testing the Reinforcing Spirals Framework in the Context of Global Warming. Journal of Communication, 64(4), 590-611. *https://doi.org/10.1111/jcom.12108*

Fesenfeld, L. P., & Rinscheid, A. (2021). Emphasizing urgency of climate change is insufficient to increase policy support. One Earth, 4(3), 411–424. *https://doi.org/10.1016/j.oneear.2021.02.010*

Fielding, K. S., Hornsey, M. J., Thai, H. A., & Toh, L. L. (2019). Using ingroup messengers and ingroup values to promote climate change policy. Climatic Change, 158, 181–199. *https://doi.org/10.1007/s10584-019-02561-z*

Fiig, C. (2011). A powerful, opinion-forming public? Rethinking the Habermasian public sphere in a perspective of feminist theory and citizenship. Distinktion: Scandinavian Journal of Social Theory, 12(3), 291-308. *https://doi.org/10.1080/1600910x.2011.621049*

Fletcher, N. Newman. R., Kalogeropoulos, A., Nielsen, R. K., & Fletcher, R. (2019). Reuters Institute Digital News Report 2019.

Flynn, C., Yamasumi, E., Fisher, S., Snow, D., Grant, Z., Kirby, M., Browning, P., Moxon, K., & Struthoff, P. (2021). The G20 Peoples' Climate Vote. United Nations Development Programme and University of Oxford. *https://www.undp.org/publications/g20-peoples-climate-vote-2021*

Ford, R., & Jennings, W. (2020). The Changing Cleavage Politics of Western Europe. Annual Review of Political Science, 23(1), 295-314. *https://doi.org/10.1146/annurev-polisci-052217-104957*

Forschungsgruppe Wahlen. (n.d.). Politbarometer: Probleme in Deutschland. *https://www.forschungsgruppe.de/Umfragen/Politbarometer/Langzeitentwicklung_-_Themen_im_Ueberblick/Politik_II/#Probl1*. Accessed October 25, 2021.

Fraser, N. (1992). Rethinking the Public Sphere: A Contribution to the Critique of actually existing democracy. Habermas and The Public Sphere, 109 142.

Garnier-Villarreal, M., & Jorgensen, T. D. (2019). Adapting Fit Indices for Bayesian Structural Equation Modeling: Comparison to Maximum Likelihood. Psychological Methods, 25(1), 46–70. *https://doi.org/10.1037/met0000224*

Gimlet Media (n.d.). How to Save a Planet. Retrieved February 26, 2021, from *gimletmedia.com: https://gimletmedia.com/shows/howtosaveaplanet*

Gladwell, M. (2000). The Tipping Point: How Little Things Can Make a Big Difference. New York: Little, Brown and Company.

Glaser, B. G., & Holton, J. (2004). Remodeling Grounded Theory. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 5(2).

Goldberg, M. H., Gustafson, A., Ballew, M. T., Rosenthal, S. A., & Leiserowitz, A. (2019). A Social Identity Approach to Engaging Christians in the Issue of Climate Change. Science Communication, 41(4), 442–463. *https://doi.org/10.1177/1075547019860847*

Goldberg, M. H., Gustafson, A., Ballew, M. T., Rosenthal, S. A., & Leiserowitz, A. (2020). Identifying the most important predictors of support for climate policy in the United States. Behavioural Public Policy. *https://doi.org/10.1017/bpp.2020.39*

Goldberg, M. H., Gustafson, A., & van der Linden, S. (2020). Leveraging Social Science to Generate Lasting Engagement with Climate Change Solutions. One Earth, 3(3), 314–324. *https://doi.org/10.1016/j.oneear.2020.08.011*

Goldberg, M. H., van der Linden, Leiserowitz, A., & Maibach, E. (2019). Perceived Social Consensus Can Reduce Ideological Biases on Climate Change. Environment and Behavior, 52(5), 495-517. *https://doi.org/10.1177/0013916519853302*

Gössling, S., Humpe, A., & Bausch, T. (2020). Does 'flight shame' affect social norms? Changing perspectives on the desirability of air travel in Germany. Journal of Cleaner Production, 266, 122015. *https://doi.org/10.1016/j.jclepro.2020.122015*

Grant, Z. P., & Tilley, J. (2018). Fertile soil: explaining variation in the success of Green parties. West European Politics, 42(3), 1–22. *https://doi.org/10.1080/01402382.2018.1521673*

Gray, D. J. (1983). Value- relevant Sociology: The Analysis of Subjects of Social Consequence, Including Implications for Human Well-being. American Journal of Economics and Sociology, 42(4), 405–416. *https://doi.org/10.1111/j.1536-7150.1983.tb01727.x*

Gregersen, T., Doran, R., Böhm, G., Tvinnereim, E., & Poortinga, W. (2020). Political Orientation Moderates the Relationship Between Climate Change Beliefs and Worry About Climate Change. Frontiers in Psychology, 11, 1573. *https://doi.org/10.3389/fpsyg.2020.01573*

Gripsrud, J., Moe, H., Mollander, A., & Murdock, G. (2010). Editors' Introduction. In J. Gripsrud, H. Moe, A. Mollander, & G. Murdock (Eds.), The idea of the public sphere (pp. xiii–xxviii). Plymouth, UK: Lexington Books.

Grundmann, R., & Scott, M. (2014). Disputed climate science in the media: Do countries matter? Public Understanding of Science, 23(2), 220–235. *http://doi.org/10.1177/0963662512467732*

Gustafson, A., Rosenthal, S. A., Ballew, M. T., Goldberg, M. H., Bergquist, P., Kotcher, J. E., Maibach, E. W., & Leiserowitz, A. (2019). The development of partisan polarization over the Green New Deal. Nature Climate Change, 9(12), 940–944. *https://doi.org/10.1038/s41558-019-0621-7*

Gurwitt, S., Malkki, K., & Mitra, M. (2017). Global issue, developed country bias: the Paris climate conference as covered by daily print news organizations in 13 nations. Climatic Change, 143(3-4), 281–296. *http://doi.org/10.1007/s10584-017-2004-2*

Habermas, J. (1962). Strukturwandel der Öffentlichkeit : Untersuchungen zu e. Kategorie d. bürgerlichen Gesellschaft. Neuwied am Rhein: Luchterhand.

Habermas, J. (1981). Theorie des kommunikativen Handelns. Frankfurt am Main: Suhrkamp Verlag.

Habermas, J. (1994). Three normative models of democracy. Constellations, 1(1), 1–10. *https://doi.org/10.1111/j.1467-8675.1994.tb00001*.

Habermas, J. (2006). Political Communication in Media Society: Does Democracy Still Enjoy an Epistemic Dimension? The Impact of Normative Theory on Empirical Research. Communication Theory, 16(4), 411-426. *https://doi.org/10.1111/j.1468-2885.2006.00280.x*

Habermas, J. (2010). The Public Sphere: An Encyclopedia Article. In J. Gripsrud, H. Moe, A. Molander, & G. Murdock, (Eds.), The idea of the public sphere (pp. 114–120). Plymouth,UK: Lexington Books. Reprinted from Habermas, J., Lennox, S., & Lennox, F. (1974). The Public Sphere: An Encyclopedia Article (1964). New German Critique, 3, 49. *https://doi.org/10.2307/487737*. Originally published in German in Fraenkel E. & Bracher K.D. (1964). Staat und Politik, Frankfurt am Main: Fischer Bücherei, pp. 220-226.)

Hake, J.-F., Fischer, W., Venghaus, S., & Weckenbrock, C. (2015). The German Energiewende - History and status quo. Energy, 92(3), 532–546. *http://doi.org/10.1016/j.energy.2015.04.027*

Hahnel, U. J. J., Mumenthaler, C., & Brosch, T. (2020). Emotional foundations of the public climate change divide. Climatic Change, 161(1), 9–19. *https://doi.org/10.1007/s10584-019-02552-0*

Hallin, D. C., & Mancini, P. (2004). Comparing Media Systems. Cambridge, UK: Cambridge University Press.

Hart, P. S., & Feldman, L. (2014). Threat Without Efficacy? Climate Change on U.S. Network News. Science Communication, 36(3), 325-351. *https://doi.org/10.1177/1075547013520239*

Hart, P. S., & Feldman, L. (2016). The Influence of Climate Change Efficacy Messages and Efficacy Beliefs on Intended Political Participation. PLOS ONE, 11(8), e0157658. *https://doi.org/10.1371/journal.pone.0157658*

Hart, P. S., & Nisbet, E. C. (2012). Boomerang Effects in Science Communication. Communication Research, 39(6), 701-723. *https://doi.org/10.1177/0093650211416646*

Hart, P. S., Nisbet, E. C., & Myers, T. A. (2015). Public attention to science and political news and support for climate change mitigation. Nature Climate Change, 5(6), 541-545. *https://doi.org/10.1038/nclimate2577*

Hase, V., Mahl, D., Schäfer, M. S., & Keller, T. R. (2021). Climate change in news media across the globe: An automated analysis of issue attention and themes in climate change coverage in 10 countries (2006–2018). Global Environmental Change, 70, 102353. *https://doi.org/10.1016/j.gloenvcha.2021.102353*

Hayes, A. F. (2009). Statistical Methods for Communication Science. Taylor & Francis.

Hayes, A. F., & Krippendorff, K. (2007). Answering the Call for a Standard Reliability Measure for Coding Data. Communication Methods and Measures, 1(1), 77–89. *http://doi.org/10.1080/19312450709336664*

Hedenus, F., Wirsenius, S., & Johansson, D. J. A. (2014). The importance of reduced meat and dairy consumption for meeting stringent climate change targets. Climatic Change, 124(1–2), 79–91. *https://doi.org/10.1007/s10584-014-1104-5*

Hmielowski, J. D., Hutchens, M. J., & Beam, M. A. (2020). Asymmetry of Partisan Media Effects?: Examining the Reinforcing Process of Conservative and Liberal Media with Political Beliefs. Political Communication, 37(6), 852-868. *https://doi.org/10.1080/10584609.2020.1763525*

Hogg, M. A., & Reid, S. A. (2006). Social Identity, Self- Categorization, and the Communication of Group Norms. Communication Theory, 16(1), 7–30. *https://doi.org/10.1111/j.1468-2885.2006.00003.x*

Honneth, A. (2012). Brutalization of the social conflict: struggles for recognition in the early 21st century. Distinktion: Scandinavian Journal of Social Theory, 13(1), 5-19. *https://doi.org/10.1080/1600910x.2012.648736*

Hopkins, D., & Markowitz, E. M. (2017). Geographies of Climate Change Belief. In M. C. Nisbet et al. (Eds.), Oxford Encyclopaedia of Climate Change Communication. Oxford University Press. *http://doi.org/10.1093/acrefore/9780190228620.013.332*

Hornsey, M. J., Fielding, K. S., McStay, R., Reser, J. P., Bradley, G. L., & Greenaway, K. H. (2015). Evidence for motivated control: Understanding the paradoxical link between threat and efficacy beliefs about climate change. Journal of Environmental Psychology, 42(Journal of Abnormal Psychology 87 1978), 57 65. *https://doi.org/10.1016/j.jenvp.2015.02.003*

Howe, P. D., Mildenberger, M., Marlon, J. R., & Leiserowitz, A. (2015). Geographic variation in opinions on climate change at state and local scales in the USA. Nature Climate Change, 5(6), 596-603. *https://doi.org/10.1038/nclimate2583*

Huddy, L. (2015). Group Identity and Political Cohesion. In Emerging Trends in the Social and Behavioral Sciences. *https://doi.org/10.1002/9781118900772.etrds0155*

Hurst, K., & Stern, M. J. (2020). Messaging for environmental action: The role of moral framing and message source. Journal of Environmental Psychology, 101394. *https://doi.org/10.1016/j.jenvp.2020.101394*

Institut für Demoskopie Allensbach. (2020). Sonntagsfrage. Retrieved January 18, 2021, from *ifd-allensbach.de: https://www.ifd-allensbach.de/studien-und-berichte/sonntagsfrage/gesamt.html*

Intergovernmental Panel on Climate Change [IPCC]. (2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

Iyengar, S., & Westwood, S. J. (2015). Fear and Loathing across Party Lines: New Evidence on Group Polarization. American Journal of Political Science, 59(3), 690–707. *https://doi.org/10.1111/ajps.12152*

Jørgensen, M., & Phillips, L. (2002). Discourse Analysis As Theory and Method. Sage Publications.

Kaiser, J., & Rhomberg, M. (2016). Questioning the Doubt: Climate Skepticism in German Newspaper Reporting on COP17. Environmental Communication, 10(5), 556–574. *http://doi.org/10.1080/17524032.2015.1050435*

Kaminska, O., & Lynn, P. (2016). Survey-based cross-country comparisons where countries vary in sample design: issues and solutions (ISER Working Paper Series No. 2016-09). Retrieved from ISER, University of Essex. *https://www.iser.essex.ac.uk*

Kerr, J. R., & Wilson, M. S. (2018). Changes in perceived scientific consensus shift beliefs about climate change and GM food safety. Plos One, 13(7), e0200295–17. *http://doi.org/10.1371/journal.pone.0200295*

Kobayashi, K. (2018). The Impact of Perceived Scientific and Social Consensus on Scientific Beliefs. Science Communication, 40(1), 63–88. *https://doi.org/10.1177/1075547017748948*

Korstenbroek, T. (2021). Rethinking the Public Sphere in an Age of Radical-Right Populism: A Case for Building an Empathetic Public Sphere. Communication Theory. *https://doi.org/10.1093/ct/qtab005*

Kousser, T., & Tranter, B. (2018). The influence of political leaders on climate change attitudes. Global Environmental Change, 50(Am. J. Polit. Sci. 22 3 1978), 100-109. *https://doi.org/10.1016/j.gloenvcha.2018.03.005*

Kruschke, J. K. (2018). Rejecting or Accepting Parameter Values in Bayesian Estimation. Advances in Methods and Practices in Psychological Science, 1(2), 270–280. *https://doi.org/10.1177/2515245918771304*

Kruschke, J. K., & Liddell, T. M. (2018). The Bayesian New Statistics: Hypothesis testing, estimation, meta-analysis, and power analysis from a Bayesian perspective. Psychonomic Bulletin & Review, 25(1), 178–206. *https://doi.org/10.3758/s13423-016-1221-4*

Kulin, J., Sevä, I. J., & Dunlap, R. E. (2021). Nationalist ideology, right-wing populism, and public views about climate change in Europe. Environmental Politics. *https://doi.org/10.1080/09644016.2021.1898879*

Latour, B. (2005). Reassembling the Social. Oxford: Oxford University Press.

Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C.-Y., & Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. Nature Climate Change, 5(11), 1014-1020. *https://doi.org/10.1038/nclimate2728*

Lees, J., & Cikara, M. (2021). Understanding and combating misperceived polarization. Philosophical Transactions of the Royal Society B, 376(1822), 20200143. *https://doi.org/10.1098/rstb.2020.0143*

Leifeld, P., & Haunss, S. (2010). A Comparison between Political Claims Analysis and Discourse Network Analysis: The Case of Software Patents in the European Union (Preprints of the Max Planck Institute for Research on Collective Goods No. 2010/21). Retrieved from SSRN: *https://dx.doi.org/10.2139/ssrn.1617194*

Leiserowitz, A, Maibach, E., Rosenthal, S., Kotcher, J., Carman, J., Wang, X., Marlon, J., Lacroix, K., & Goldberg, M. (2021). Climate Change in the American Mind March 2021. Yale University and George Mason University.

Leiserowitz, A, Maibach, E., Rosenthal, S., Kotcher, J., Carman, J., Neyens, L., Goldberg, M., Lacroix, K., & Marlon, J. (2021). Politics & Global Warming, September 2021. Yale University and George Mason University.

Leiserowitz, A., Roser-Renouf, C., Marlon, J., & Maibach, E. (2021). Global Warming's Six Americas: a review and recommendations for climate change communication. Current Opinion in Behavioral Sciences, 42, 97–103. *https://doi.org/10.1016/j.cobeha.2021.04.007*

Leiserowitz, A., Maibach, E., Rosenthal, S. A., Kotcher, J., Bergquist, P., Ballew, M. T., ... Wang, X. (2020a). Climate change in the American Mind, April 2020. New Haven, CT: Yale Program on Climate Change Communication. *https://doi.org/10.31234/osf.io/8439q*

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Carman, J., X, W., Goldberg, M., Lacroix, K., & Marlon, J. (2020). Politics & Global Warming, December 2020. Yale University and George Mason University. New Haven, US: Yale Program on Climate Change Communication.

Leiserowitz, A., Maibach, E. W., Roser-Renouf, C., Rosenthal, S., Cutler, M., & Kotcher, J. E. (2018). Politics & Global Warming, March 2018. New Haven, CT, USA: Yale Program on Climate Change Communication.

Lenton, T. M., Held, H., Kriegler, E., Hall, J. W., Lucht, W., Rahmstorf, S., & Schellnhuber, H. J. (2008). Tipping elements in the Earth's climate system. Proceedings of the National Academy of Sciences, 105(6), 1786–1793. *https://doi.org/10.1073/pnas.0705414105*

Lester, M. (1980). Generating Newsworthiness: The Interpretive Construction of Public Events. American Sociological Review, 45(6), 984–994. *http://doi.org/10.2307/2094914?refreqid=search-gateway*: d7e1851ebd1944b89494854114421f65

Lewandowsky, S., Cook, J., Fay, N., & Gignac, G. E. (2019). Science by social media: Attitudes towards climate change are mediated by perceived social consensus. Memory & Cognition, 47(8), 1445–1456. *https://doi.org/10.3758/s13421-019-00948-y*

Lewandowsky, S., Ecker, U. K. H., & Cook, J. (2017). Beyond Misinformation: Understanding and Coping with the "Post-Truth" Era. Journal of Applied Research in Memory and Cognition, 6(4), 353–369. *https://doi.org/10.1016/j.jarmac.2017.07.008*

Light, A. (2000). What is an ecological identity? Environmental Politics, 9(4), 59–81. *https://doi.org/10.1080/09644010008414551*

Loy, L. S. (2018). Communicating climate change : how proximising climate change and global identity predict engagement. [Doctoral dissertation, University of Hohenheim]. University of Hohenheim Library Archive. *http://opus.uni-hohenheim.de/volltexte/2018/1538/*

Lorenzoni, I., Nicholson-Cole, S., & Whitmarsh, L. (2007). Barriers perceived to engaging with climate change among the UK public and their policy implications. Global Environmental Change, 17(3-4), 445–459. *http://doi.org/10.1016/j.gloenvcha.2007.01.004*

Lucas, C. H. (2018). Concerning values: what underlies public polarisation about climate change? Geographical Research, 17(2), 1–13. *http://doi.org/10.1111/1745-5871.12284*

Lumley, T. (2004). Analysis of Complex Survey Samples. Journal of Statistical Software, 9(8). *http://doi.org/10.18637/jss.v009.i08*

Ma, Y., Dixon, G., & Hmielowski, J. D. (2018). Psychological Reactance From Reading Basic Facts on Climate Change: The Role of Prior Views and Political Identification. Environmental Communication, 13(1), 71–86. *https://doi.org/10.1080/17524032.2018.1548369*

Maertens, R., Anseel, F., & Linden, S. van der. (2020). Combatting climate change misinformation: Evidence for longevity of inoculation and consensus messaging effects. Journal of Environmental Psychology, 70, 101455. *https://doi.org/10.1016/j.jenvp.2020.101455*

Mahl, D., Brüggemann, M., Guenther, L., & Silva-Schmidt, F. D. (2020). Public opinion at a tipping point: Germany's path to engaging with climate protection. Down to Earth Working Paper, March 2020. Hamburg: University of Hamburg.

McCluskey, M., & Kim, Y. M. (2012). Moderatism or Polarization? Representation of Advocacy Groups' Ideology in Newspapers. Journalism & Mass Communication Quarterly, 89(4), 565–584. *http://doi.org/10.1177/1077699012455385*

McCright, A. M., Dentzman, K., Charters, M., & Dietz, T. (2013). The influence of political ideology on trust in science. Environmental Research Letters, 8(4), 044029. *http://doi.org/10.1088/1748-9326/8/4/044029*

McCright, A M, & Dunlap, R. E. (2011). The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001-2010. The Sociological Quarterly, 52(2), 155-194. *https://doi.org/10.1111/j.1533-8525.2011.01198.x*

McCright, Aaron M., Dunlap, R. E., & Marquart-Pyatt, S. T. (2015). Political ideology and views about climate change in the European Union. Environmental Politics, 25(2), 338–358. *https://doi.org/10.1080/09644016.2015.1090371*

McIntyre, K. (2019). Solutions Journalism. Journalism Practice, 13(1), 1–19. *https://doi.org/10.1080/17512786.2017.1409647*

McLaughlin, B., McLeod, D. M., Davis, C., Perryman, M., & Mun, K. (2016). Elite Cues, News Coverage, and Partisan Support for Compromise. Journalism & Mass Communication Quarterly, 94(3), 862–882. *http://doi.org/10.1177/1077699016655755*

Mead, E., Roser-Renouf, C., Rimal, R. N., Flora, J. A., Maibach, E. W., & Leiserowitz, A. (2012). Information Seeking About Global Climate Change Among Adolescents: The Role of Risk Perceptions, Efficacy Beliefs, and Parental Influences. Atlantic Journal of Communication, 20(1), 31-52. *https://doi.org/10.1080/15456870.2012.637027*

Merkle, E. C., & Rosseel, Y. (2018). blavaan : Bayesian Structural Equation Models via Parameter Expansion. Journal of Statistical Software, 85(4). *https://doi.org/10.18637/jss.v085.i04*

Metag, J., Füchslin, T., & Schäfer, M. S. (2015). Global warming's five Germanys: A typology of Germans' views on climate change and patterns of media use and information. Public Understanding of Science, 26(4), 434-451. *https://doi.org/10.1177/0963662515592558*

Michael, M. (2017). Actor Network Theory. Los Angeles: Sage Publishing.

Mildenberger, M., Howe, P., Lachapelle, E., Stokes, L., Marlon, J., & Gravelle, T. (2016). The Distribution of Climate Change Public Opinion in Canada. Plos One, 11(8), e0159774–14. *http://doi.org/10.1371/journal.pone.0159774*

Milfont, T. L. (2012). The interplay between knowledge, perceived efficacy, and concern about global warming and climate change: a one-year longitudinal study. Risk Analysis : An Official Publication of the Society for Risk Analysis, 32(6), 1003–1020. *https://doi.org/10.1111/j.1539-6924.2012.01800.x*

Morris, H. E. (2020). Constructing the Millennial "Other" in United States Press Coverage of the Green New Deal. Environmental Communication, 15(1), 133–143. *https://doi.org/10.1080/17524032.2020.1812686*

Moser, S. C. (2010). Communicating climate change: history, challenges, process and future directions. Wiley Interdisciplinary Reviews: Climate Change, 1(1), 31-53. *https://doi.org/10.1002/wcc.11*

Moser, S. C. (2016). Reflections on climate change communication research and practice in the second decade of the 21st century: What more is there to say? Wiley Interdisciplinary Reviews: Climate Change, 7(3), 345-369. *https://doi.org/10.1002/wcc.403*

Moser, S. C., & Dilling, L. (2007). Toward the social tipping point: creating a Climate for Change. In S. C. Moser & L. Dilling (Eds.), Creating a climate for change: Communicating Climate Change and Facilitating Social Change (pp. 491–516). Cambridge, UK: Cambridge University Press. *https://doi.org/10.1017/cbo9780511535871.035*

Mouffe, C. (1999). Deliberative Democracy or Agonistic Pluralism? Social Research, 66(3), 745–758.

Muller, A. (2015, April). Measuring Policy Controversy with Discourse Network Analysis: The Abortion Debates in Belgium 1972 – 1990 Revisited. Paper presented at the MPSA Conference, Chicago, IL, USA.

Mutz, D. C., & Reeves, B. (2005). The New Videomalaise: Effects of Televised Incivility on Political Trust. The American Political Science Review, 99(01), 1–17. *http://doi.org/10.1017/S0003055405051452*

Myers, T. A., Nisbet, M. C., Maibach, E. W., & Leiserowitz, A. A. (2012). A public health frame arouses hopeful emotions about climate change. Climatic Change, 113(3–4), 1105-1112. *https://doi.org/10.1007/s10584-012-0513-6*

Näsström, S. (2011). The Challenge of the All- Affected Principle. Political Studies, 59(1), 116–134. *https://doi.org/10.1111/j.1467-9248.2010.00845.x*

Newman, N., Fletcher, R., Kalogeropoulos, A., Levy, D. A., & Nielsen, R. K. (2017). Reuters Institute Digital News Report 2017. Retrieved from Reuters Institute for the Study of Journalism, University of Oxford. *reutersinstitute.politics.ox.ac.uk*

Newman, N., Fletcher, R., Kalogeropoulos, A., Levy, D. A. L., & Nielsen, R. K. (2018). Reuters Institute Digital News Report 2018. Reuters Insitute for the Study of Journalism. *https://reutersinstitute.politics.ox.ac.uk/sites/default/files/digital-news-report-2018.pdf*

Newman, T. P., Nisbet, E. C., & Nisbet, M. C. (2018). Climate change, cultural cognition, and media effects: Worldviews drive news selectivity, biased processing, and polarised attitudes: Public Understanding of Science, 27(8), 985-1002. *https://doi.org/10.1177/0963662518801170*

Nisbet, E. C., Hart, P. S., Myers, T., & Ellithorpe, M. (2013). Attitude Change in Competitive Framing Environments? Open-/Closed-Mindedness, Framing Effects, and Climate Change. Journal of Communication, 63(4), 766–785. *http://doi.org/10.1111/jcom.12040*

Painter, J., & Ashe, T. (2012). Cross-national comparison of the presence of climate scepticism in the print media in six countries, 2007–10. Environmental Research Letters, 7(4).

Party, T. R. (2016). The 2016 Republican Party Platform. https://www.presidency.ucsb.edu/documents/2016-republican-party-platform. Accessed on October 25, 2021

Pearce, W., Grundmann, R., Hulme, M., Raman, S., Kershaw, E. H., & Tsouvalis, J. (2013). The pivotal role of perceived scientific consensus in acceptance of science. Nature Climate Change, 3(4), 399–404. *https://doi.org/10.1038/nclimate1720*

Pechar, E., Bernauer, T., & Mayer, F. (2018). Beyond Political Ideology: The Impact of Attitudes Towards Government and Corporations on Trust in Science. Science Communication, 24(1), 107554701876397–23. *http://doi.org/10.1177/1075547018763970*

Pepermans, Y., & Maeseele, P. (2016). The politicization of climate change: problem or solution? Wiley Interdisciplinary Reviews: Climate Change, 7(4), 478-485. *https://doi.org/10.1002/wcc.405*

Pepermans, Y., & Maeseele, P. (2018). Manufacturing Consent: Rereading News on Four Climate Summits (2000-2012). Science Communication, 40(5), 621-649. *https://doi.org/10.1177/1075547018798119*

Poortinga, W., Fisher, S., Böhm, G., Steg, L., Whitmarsh, L., & Ogunbode, C. (2018). European Attitudes to Climate Change and Energy (ESS Topline Results Series Issue No. 9). London: European Social Survey ERIC.

Poortinga, W., Whitmarsh, L., Steg, L., Böhm, G., & Fisher, S. (2019). Climate change perceptions and their individual-level determinants: A cross-European analysis. Global Environmental Change, 55, 25–35. *https://doi.org/10.1016/j.gloenvcha.2019.01.007*

Price, V. (1989). Social Identification and Public Opinion: Effects of Communicating Group Conflict. Public Opinion Quarterly, 53(2), 197. *http://doi.org/10.1086/269503*

Quéré, C. L., Korsbakken, J. I., Wilson, C., Tosun, J., Andrew, R., Andres, R. J., … Vuuren, D. P. van. (2019). Drivers of declining CO2 emissions in 18 developed economies. Nature Climate Change, 9(3), 213–217. *https://doi.org/10.1038/s41558-019-0419-7*

Quitzow, L., Canzler, W., Grundmann, P., Leibenath, M., Moss, T., & Rave, T. (2016). The German Energiewende – What's happening? Introducing the special issue. Utilities Policy, 41, 163-171. *https://doi.org/10.1016/j.jup.2016.03.002*

Rebich-Hespanha, S., Rice, R. E., Montello, D. R., Retzloff, S., Tien, S., & Hespanha, J. P. (2014). Image Themes and Frames in US Print News Stories about Climate Change. Environmental Communication, 9(4), 491–519. *http://doi.org/10.1080/17524032.2014.983534*

Reese, S. D., & Shoemaker, P. J. (2016). A Media Sociology for the Networked Public Sphere: The Hierarchy of Influences Model. Mass Communication and Society, 19(4), 389-410. *https://doi.org/10.1080/15205436.2016.1174268*

Renn, O., & Marshall, J. P. (2016). Coal, nuclear and renewable energy policies in Germany_ From the 1950s to the "Energiewende." Energy Policy, 99(C), 224–232. *http://doi.org/10.1016/j.enpol.2016.05.004*

Rice, R. E., Gustafson, A., & Hoffman, Z. (2018). Frequent but Accurate: A Closer Look at Uncertainty and Opinion Divergence in Climate Change Print News. Environmental Communication, 12(3), 301-321. *https://doi.org/10.1080/17524032.2018.1430046*

Roelfsema, M., Soest, H. L. van, Harmsen, M., Vuuren, D. P. van, Bertram, C., Elzen, M. den, ... Vishwanathan, S. S. (2020). Taking stock of national climate policies to evaluate implementation of the Paris Agreement. Nature Communications, 11(1), 2096. *https://doi.org/10.1038/s41467-020-15414-6*

Romsdahl, R., Blue, G., & Kirilenko, A. (2018). Action on climate change requires deliberative framing at local governance level. Climatic Change, 149(3–4), 277-287. *https://doi.org/10.1007/s10584-018-2240-0*

Rugeley, C. R., & Gerlach, J. D. (2012). Understanding Environmental Public Opinion by Dimension: How Heuristic Processing Mitigates High Information Costs on Complex Issues. Politics & Policy, 40(3), 444-470. *https://doi.org/10.1111/j.1747-1346.2012.00352.x*

Russill, C., & Nyssa, Z. (2009). The tipping point trend in climate change communication. Global Environmental Change, 19(3), 336–344. *https://doi.org/10.1016/j.gloenvcha.2009.04.001*

Schäfer, M. S. (2016). Climate Change Communication in Germany. Oxford Encyclopedia of Climate Change Communication. *https://doi.org/10.1093/acrefore/9780190228620.013.448*

Schäfer, M. S., Berglez, P., Wessler, H., Eide, E., Nerlich, B., & ONeill, S. R. (2016). Investigating Mediated Climate Change Communication: A Best-Practice Guide (Research Reports No. 6, 2016). Retrieved from Jönköping University: *www.ju.se*

Schäfer, M. S., Ivanova, A., & Schmidt, A. (2013). What drives media attention for climate change? Explaining issue attention in Australian, German and Indian print media from 1996 to 2010. International Communication Gazette, 76(2), 152–176. *http://doi.org/10.1177/1748048513504169*

Schäfer, M. S., & O'Neill, S. (2017). Frame Analysis in Climate Change Communication. In H. Von Storch et al. (Eds.), Oxford Research Encyclopaedia of Climate Science. Oxford University Press. *http://doi.org/10.1093/acrefore/9780190228620.013.487*

Scharks, T. (2016). Threatening Messages in Climate Change Communication. [Doctoral dissertation, University of Washington]. University of Washington Research Works Archive. *https://digital.lib.washington.edu/researchworks/handle/1773/36393*

Scheufele, D. A., & Tewksbury, D. (2007). Framing, Agenda Setting, and Priming: The Evolution of Three Media Effects Models. Journal of Communication, 57(1), 9-20. *https://doi.org/10.1111/j.1460-2466.2006.00326.x*

Schlichting, I., & Schäfer, M. S. (2014). Media Representations of Climate Change: A Meta-Analysis of the Research Field. Environmental Communication, 8(2), 142-160. *https://doi.org/10.1080/17524032.2014.914050*

Schmid-Petri, H. (2015). Do Conservative Media Provide a Forum for Skeptical Voices? The Link Between Ideology and the Coverage of Climate Change in British, German, and Swiss Newspapers. Environmental Communication, 11(4), 554-567. *https://doi.org/10.1080/17524032.2017.1280518*

Schmid-Petri, H. (2017). Politicization of science: how climate change skeptics use experts and scientific evidence in their online communication. Climatic Change, 145(3–4), 523-537. *https://doi.org/10.1007/s10584-017-2112-z*

Schmid-Petri, H., Adam, S., Schmucki, I., & Häussler, T. (2017). A changing climate of skepticism: The factors shaping climate change coverage in the US press. Public Understanding of Science, 26(4), 498-513. *https://doi.org/10.1177/0963662515612276*

Schmid-Petri, H., & Bürger, M. (2021). The effect of misinformation and inoculation: Replication of an experiment on the effect of false experts in the context of climate change communication. Public Understanding of Science, 096366252110245. *https://doi.org/10.1177/09636625211024550*

Schmidt, V. A. (2011). Speaking of change: why discourse is key to the dynamics of policy transformation. Critical Policy Studies, 5(2), 106-126. *https://doi.org/10.1080/19460171.2011.576520*

Schönbrodt, F. D., & Wagenmakers, E.-J. (2018). Bayes factor design analysis: Planning for compelling evidence. Psychonomic Bulletin & Review, 25(1), 128–142. *https://doi.org/10.3758/s13423-017-1230-y*

Schoot, R. van, Veen, D., Smeets, L., Winter, S. D., & Depaoli, S. (2020). A tutorial on using the WAMBS checklist to avoid the misuse of Bayesian statistics. In R. van de Schoot & M. Miočevic (Eds.), Small Sample Size Solutions (pp. 30–49). Oxon, UK: Routledge.

Schuck, A. R. T., Vliegenthart, R., & Vreese, C. H. de. (2016). Who's Afraid of Conflict? The Mobilizing Effect of Conflict Framing in Campaign News. British Journal of Political Science, 46(01), 177-194. *https://doi.org/10.1017/s0007123413000525*

Schwirplies, C. (2018). Citizens' Acceptance of Climate Change Adaptation and Mitigation: A Survey in China, Germany, and the U.S. Ecological Economics, 145, 308–322. *https://doi.org/10.1016/j.ecolecon.2017.11.003*

Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics: A content analysis of press and television news. Journal of Communication, 50(2), 93–109. *http://doi.org/10.1093/joc/50.2.93*

Seyranian, V. (2014). Social identity framing communication strategies for mobilising social change. The Leadership Quarterly, 25(3), 468–486. *https://doi.org/10.1016/j.leaqua.2013.10.013*

Simis, M. J., Madden, H., Cacciatore, M. A., & Yeo, S. K. (2016). The lure of rationality: Why does the deficit model persist in science communication? Public Understanding of Science, 25(4), 400–414. *https://doi.org/10.1177/0963662516629749*

Slater, M. D. (2007). Reinforcing Spirals: The Mutual Influence of Media Selectivity and Media Effects and Their Impact on Individual Behavior and Social Identity. Communication Theory, 17(3), 281-303. *https://doi.org/10.1111/j.1468-2885.2007.00296.x*

Smith, E. K., & Mayer, A. (2019). Anomalous Anglophones? Contours of free market ideology, political polarization, and climate change attitudes in English-speaking countries, Western European and post-Communist states. Climatic Change, 152(1), 17–34. *https://doi.org/10.1007/s10584-018-2332-x*

Smith, P. S., & Lynch, M. P. (2020). Varieties of Deep Epistemic Disagreement. Topoi. *https://doi.org/10.1007/s11245-020-09694-2*

Sonnberger, M., & Ruddat, M. (2016). Die gesellschaftliche Wahrnehmung der Energiewende (Stuttgarter Beiträge zur Risiko- und Nachhaltigkeitsforschung No. 34). Retrieved from the University of Stuttgart: *http://dx.doi.org/10.18419/opus-9018*

Statistisches Bundesamt. (2020a). Bevölkerungsstand. Retrieved January 18, 2021, from undefined website: *https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Bevoelkerungsstand/Tabellen/zensus-geschlecht-staatsangehoerigkeit-2020.html*

Staistisches Bundesamt. (2020b). Durchschnittsalter nach Geschlecht und Staatsangehörigkeit 2011 bis 2019. Retrieved January 18, 2021, from *destatis.de: https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Bevoelkerungsstand/Tabellen/durchschnittsalter-zensus-jahre.html*

Stoddart, M. C. J., Tindall, D. B., Smith, J., & Haluza-Delay, R. (2017). Media Access and Political Efficacy in the Eco-politics of Climate Change: Canadian National News and Mediated Policy Networks. Environmental Communication, 11(3), 386–400. *http://doi.org/10.1080/17524032.2016.1275731*

Stroud, N. J. (2010). Polarization and Partisan Selective Exposure. Journal of Communication, 60(3), 556–576. *https://doi.org/10.1111/j.1460-2466.2010.01497.x*

Sturgis, P., & Allum, N. (2004). Science in Society: Re-Evaluating the Deficit Model of Public Attitudes. Public Understanding of Science, 13(1), 55–74. *https://doi.org/10.1177/0963662504042690*

Tavory, I., & Timmermans, S. (2014). Abductive Analysis. Chicago: University of Chicago Press.

The Republican Party (2016). The 2016 Republican Party Platform. https://www.presidency.ucsb.edu/documents/2016-republican-party-platform. Accessed May 5, 2021.

Tracy, P. E., & Carkin, D. M. (2011). Adjusting for Design Effects in Disproportionate Stratified Sampling Designs Through Weighting. Crime & Delinquency, 60(2), 306–325. *http://doi.org/10.1177/0011128714522114*

Treen, K. M. d'I., Williams, H. T. P., & O'Neill, S. J. (2020). Online misinformation about climate change. Wiley Interdisciplinary Reviews: Climate Change, 11(5). *https://doi.org/10.1002/wcc.665*

Tschötschel, R. (2021). Polarisation vs consensus-building: How US and German news media portray climate change as a feature of political identities. SocArXiv. https://doi.org/10.31235/osf.io/r5zdc

Tschötschel, R., & Jacobs, T. (2021). Bringing agency back in: the missing link between identity, knowledge, and mediated discourse. *https://doi.org/10.31235/osf.io/k87cd*

Tschötschel, R., Schuck, A., Schwinges, A., & Wonneberger, A. (2021). Climate change policy support, intended behaviour change, and their drivers largely unaffected by consensus messages in Germany. Journal of Environmental Psychology, 76, 101655. https://doi.org/10.1016/j.jenvp.2021.101655

Tschötschel, R., Schuck, A., & Wonneberger, A. (2020). Patterns of controversy and consensus in German, Canadian, and US online news on climate change. Global Environmental Change, 60, 101957. https://doi.org/10.1016/j.gloenvcha.2019.101957

Turner, J. C., Oakes, P. J., Haslam, S. A., & McGarty, C. (1994). Self and Collective: Cognition and Social Context. Personality and Social Psychology Bulletin, 20(5), 454–463. *https://doi.org/10.1177/0146167294205002*

Tucker, K. H. (2005). From the Imaginary to Subjectivation: Castoriadis and Touraine on the Performative Public Sphere. Thesis Eleven, 83(1), 42–60. *https://doi.org/10.1177/0725513605057136*

Van Aelst, P., Sheafer, T., & Stanyer, J. (2012). The personalization of mediated political communication: A review of concepts, operationalizations and key findings. Journalism: Theory, Practice & Criticism, 13(2), 203–220. *http://doi.org/10.1177/1464884911427802*

van der Linden, S. (2016). A Conceptual Critique of the Cultural Cognition Thesis. Science Communication, 38(1), 128–138. *https://doi.org/10.1177/1075547015614970*

van der Linden, S. (2021). The Gateway Belief Model (GBM): A Review and Research Agenda for Communicating the Scientific Consensus on Climate Change. Current Opinion in Psychology, 42, 7–12. *https://doi.org/10.1016/j.copsyc.2021.01.005*

van der Linden, S., Leiserowitz, A. A., Feinberg, G. D., & Maibach, E. W. (2015). The Scientific Consensus on Climate Change as a Gateway Belief: Experimental Evidence. PLOS ONE, 10(2), e0118489 8. *https://doi.org/10.1371/journal.pone.0118489*

van der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the Public against Misinformation about Climate Change. Global Challenges, 1(2), 1600008. *https://doi.org/10.1002/gch2.201600008*

van der Linden, S. L ., Leiserowitz, A., & Maibach, E. (2019). The gateway belief model: A large-scale replication. Journal of Environmental Psychology, 62, 1-47. *https://doi.org/10.1016/j.jenvp.2019.01.009*

van der Linden, S., Maibach, E., & Leiserowitz, A. (2019). Exposure to Scientific Consensus Does Not Cause Psychological Reactance. Environmental Communication. *https://doi.org/10.1080/17524032.2019.1617763*

Venturini, T. (2009). Diving in magma: how to explore controversies with actor-network theory. Public Understanding of Science, 19(3), 258-273. *https://doi.org/10.1177/0963662509102694*

Verplanken, B., Marks, E., & Dobromir, A. I. (2020). On the nature of eco-anxiety: How constructive or unconstructive is habitual worry about global warming? Journal of Environmental Psychology, 72, 101528. *https://doi.org/10.1016/j.jenvp.2020.101528*

Verschoor, M., Albers, C., Poortinga, W., Böhm, G., & Steg, L. (2020). Exploring relationships between climate change beliefs and energy preferences: A network analysis of the European Social Survey. Journal of Environmental Psychology, 70, 101435. *https://doi.org/10.1016/j.jenvp.2020.101435*

von Zabern, L., & Tulloch, C. D. (2021). Rebel with a cause: the framing of climate change and intergenerational justice in the German press treatment of the Fridays for Future protests. Media, Culture & Society, 43(1), 23–47. *https://doi.org/10.1177/0163443720960923*

Vos, T., & Shoemaker, P. J. (2009). Gatekeeping Theory. New York: Routledge. *https://doi.org/10.4324/9780203931653*

Wagner, M. (2021). Affective polarization in multiparty systems. Electoral Studies, 69, 102199. *https://doi.org/10.1016/j.electstud.2020.102199*

Weingart, P., Engels, A., & Pansegrau, P. (2000). Risks of communication: discourses on climate change in science, politics, and the mass media. Public Understanding of Science, 9(3), 261-283. *https://doi.org/10.1088/0963-6625/9/3/304*

Werff, E. van der, Steg, L., & Keizer, K. (2013). The value of environmental self-identity: The relationship between biospheric values, environmental self-identity and environmental preferences, intentions and behaviour. Journal of Environmental Psychology, 34, 55–63. *https://doi.org/10.1016/j.jenvp.2012.12.006*

Wessler, H., Wozniak, A., Hofer, L., & Lück, J. (2016). Global Multimodal News Frames on Climate Change. The International Journal of Press/Politics, 21(4), 423–445. *http://doi.org/10.1177/1940161216661848*

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. Communication Monographs, 59(4), 329–349. *https://doi.org/10.1080/03637759209376276*

Yale Program on Climate Change Communication (YPCCC) & George Mason University Center for Climate Change Communication (Mason 4C). (2020). Climate Change in the American Mind: National survey data on public opinion (2008-2018). [Data file and codebook]. *https://osf.io/jw79p/*. *https://doi.org/10.17605/OSF.IO/JW79P*

Yang, Z. J., Rickard, L. N., Harrison, T. M., & Seo, M. (2014). Applying the Risk Information Seeking and Processing Model to Examine Support for Climate Change Mitigation Policy. Science Communication, 36(3), 296-324. *https://doi.org/10.1177/1075547014525350*

Yudkin, D., Hawkins, S., & Dixon, T. (2019). The perception gap: how false impressions are pulling Amercians apart [Report]. More in Common. *https://perceptiongap.us/media/zaslaroc/perception-gap-report-1-0-3.pdf*

Zawadzki, S. J., Bouman, T., Steg, L., Bojarskich, V., & Druen, P. B. (2020). Translating climate beliefs into action in a changing political landscape. Climatic Change, 161(1), 21–42. *https://doi.org/10.1007/s10584-020-02739-w*

Zhao, X. (2009). Media Use and Global Warming Perceptions. Communication Research, 36(5), 698-723. *https://doi.org/10.1177/0093650209338911*

Zhou, J. (2016). Boomerangs versus Javelins: How Polarization Constrains Communication on Climate Change. Environmental Politics, 25(5), 788–811. *https://doi.org/10.1080/09644016.2016.1166602*

AUTHOR CONTRIBUTIONS

Chapter I: Authored by Robin Tschötschel

Chapter II: Robin Tschötschel: Project administration, Conceptualization, Data curation, Methodology, Formal analysis, Visualisation, Writing. Andreas Schuck: Supervision, Funding acquisition, Conceptualization, Methodology. Anke Wonneberger: Supervision, Funding acquisition, Conceptualization, Methodology.

Chapter III: Authored by Robin Tschötschel

Chapter IV: Robin Tschötschel: Project administration, Funding acquisition, Conceptualization, Data curation, Methodology, Formal analysis, Visualisation, Writing. Andreas Schuck: Supervision, Funding acquisition, Conceptualization, Methodology. Alexandra Schwinges: Methodology, Survey implementation, Resources. Anke Wonneberger: Supervision, Funding acquisition, Conceptualization, Methodology.

Chapter V: Authored by Robin Tschötschel

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appendix

APPENDIX 3A: NEWS ITEMS REFERENCED AND ANALYSES

SÜDDEUTSCHE ZEITUNG

1. Klimaschutz: Schulze will CO_2-Steuer an Klimaprämie koppeln. (2019, July 05). Retrieved from *https://www.sueddeutsche.de/wirtschaft/co2-steuer-schulze-klimapraemie-1.4512751*
2. Europawahl: Was die Parteien wollen - und was sie ablehnen. (2019, May 03). Retrieved from *https://www.sueddeutsche.de/politik/europawahl-wahlprogramme-parteien-1.4427514*
3. Umweltpolitik: Merkel will CO_2-Neutralität bis 2050 erreichen. (2019, May 14). Retrieved from *https://www.sueddeutsche.de/politik/merkel-klimaneutralitaet-deutschland-1.4446004*
4. Ökologie: Technik alleine wird den Klimawandel nicht stoppen. (2019, May 05). Retrieved from *https://www.sueddeutsche.de/wissen/klimawandel-plastik-technik-umweltprobleme-1.4429310*
5. Union: Die Volksparteien begreifen nicht, wie existenziell der Klimawandel alle betrifft. (2019, May 28). Retrieved from *https://www.sueddeutsche.de/politik/union-die-volksparteien-begreifen-nicht-wie-existenziell-der-klimawandel-alle-betrifft-1.4465838*
6. Prinzip der Freiwilligkeit: "Positive Anreize". (2019, July 01). Retrieved from *https://www.sueddeutsche.de/bayern/prinzip-der-freiwilligkeit-positive-anreize-1.4506973*
7. Kabinett: Klimaneutral "2040 plus". (2019, July 30). Retrieved from *https://www.sueddeutsche.de/bayern/kabinett-klimaneutral-2040-plus-1.4545926*
8. CO2-Steuer: Klimaschutz, aber richtig. (2019, July 25). Retrieved from *https://www.sueddeutsche.de/wissen/co2-preis-steuer-klimawandel-1.4538024*
9. CO_2-Steuer: 1000 Euro für den Klimaschutz - und dann?. (2019, July 18). Retrieved from *https://www.sueddeutsche.de/wirtschaft/co-steuer-studie-preis-1.4528681*
10. Klimawandel: "Zu schön, um wahr zu sein". (2019, July 10). Retrieved from *https://www.sueddeutsche.de/wissen/aufforstung-klimawandel-waelder-geoengineering-1.4516765*
11. Harvard-Würden für Merkel: Ein Ehrendoktor für Pragmatismus. (2019, May 30). Retrieved from *https://www.sueddeutsche.de/politik/merkel-harvard-doktor-rede-1.4469164*

12. Aufruf von “Fridays for Future”: Streikt mit uns!. (2019, May 23). Retrieved from *https://www.sueddeutsche.de/kultur/greta-thunberg-fridays-for-future-streik-1.4459464*
13. Hauptversammlung: Die Enkel haben keine Lust auf RWE. (2019, May 03). Retrieved from *https://www.sueddeutsche.de/wirtschaft/rwe-kohle-klimawandel-hauptversammlung-proteste-1.4431005*
14. Fridays for Future: Greta Thunberg segelt nach Amerika. (2019, July 29). Retrieved from *https://www.sueddeutsche.de/panorama/thunberg-friday-for-future-klima-1.4545338*
15. Umweltschutz: Warum der Kapitalismus nicht schuld ist am Klimawandel. (2019, July 29). Retrieved from *https://www.sueddeutsche.de/wirtschaft/klimaschutz-kapitalismus-1.4539483*
16. Geowissenschaften: Zeitreise im Permafrost. (2019, July 22). Retrieved from *https://www.sueddeutsche.de/wissen/klimaforschung-geowissenschaften-batagaika-permafrost-1.4531840*
17. Weniger Emissionen: Wie kann man vernünftig fliegen?. (2019, July 02). Retrieved from *https://www.sueddeutsche.de/auto/weniger-emissionen-wie-kann-man-vernuenftig-fliegen-1.4498824*
18. Gebotene Verbote: Echter Klimaschutz wird weh tun. (2019, July 13). Retrieved from *https://www.sueddeutsche.de/politik/klimawandel-klimaschutz-umwelt-1.4520484*
19. Klimaschutz: So will Bosch bis 2020 CO_2-neutral werden. (2019, May 09). Retrieved from *https://www.sueddeutsche.de/wirtschaft/bosch-klimaneutral-co-1.4439849*

UNREFERENCED ITEMS

- Bundeshaushalt: Von dieser Regierung sind keine großen Ideen mehr zu erwarten. (2019, June 26). Retrieved from *https://www.sueddeutsche.de/wirtschaft/bundeshaushalt-etat-klimaschutz-schwarze-null-1.4498122*
- Nach Freitags-Demonstration: ÖDP fordert Klimadialog mit Schulen. (2019, May 06). Retrieved from *https://www.sueddeutsche.de/muenchen/ebersberg/nach-freitags-demonstration-oedp-fordert-klimadialog-mit-schulen-1.4434750*
- Viel zu tun bis 2023: Vorreiter in Sachen Vorsorge. (2019, May 02). Retrieved from *https://www.sueddeutsche.de/muenchen/ebersberg/viel-zu-tun-bis-vorreiter-in-sachen-vorsorge-1.4430013*

- Umwelt und Naturschutz: Der Wald ist in akuter Gefahr. (2019, June 15). Retrieved from *https://www.sueddeutsche.de/muenchen/wald-gefahr-umwelt-naturschutz-klimawandel-1.4487198*
- Umwelt: Der abgestraften Regierung fehlt in der Klimapolitik ein klarer Kurs. (2019, May 30). Retrieved from *https://www.sueddeutsche.de/wirtschaft/klimawandel-regierung-europawahlen-1.4468092*
- Literatur: Ohnmächtig die Hände ringen. (2019, June 29). Retrieved from *https://www.sueddeutsche.de/kultur/nathaniel-rich-losing-earth-rezension-1.4498206*
- Klimaschutz: Der Ausbau sauberer Energien geht zu langsam voran. (2019, June 18). Retrieved from *https://www.sueddeutsche.de/wissen/klimaschutz-erneuerbare-energie-windkraft-solarenergie-1.4490337*
- Unterwegs mit dem Andechser Revierförster: Der Klimawandel bedroht den Wald doppelt. (2019, May 26). Retrieved from *https://www.sueddeutsche.de/muenchen/starnberg/klimawandel-wald-erderwaermung-starnberg-1.4461940*
- Mobilität: Die Bahn ist ihrer Rolle in der Klimadebatte nicht gewachsen. (2019, July 26). Retrieved from *https://www.sueddeutsche.de/wirtschaft/deutsche-bahn-investitionen-1.4540700*
- Klimawandel: Reben auf der Flucht. (2019, May 25). Retrieved from *https://www.sueddeutsche.de/wissen/wein-frankreich-klimawandel-1.4461393*
- Nächste Demo in Grafing: Rückenwind. (2019, May 16). Retrieved from *https://www.sueddeutsche.de/muenchen/ebersberg/naechste-demo-in-grafing-rueckenwind-1.4450009*
- Dänemark: 19-Jähriger will für das Klima 30 Tage hungern. (2019, May 11). Retrieved from *https://www.sueddeutsche.de/panorama/klima-thunberg-schulstreik-hungerstreik-daenemark-1.4442407*
- Folgen der Klimakrise: Wenn Rentiere plötzlich Seegras fressen. (2019, July 30). Retrieved from *https://www.sueddeutsche.de/politik/rentiere-spitzbergen-klimakrise-1.4545001*
- Steigerwaldbahn: Endstation Schrottplatz. (2019, June 09). Retrieved from *https://www.sueddeutsche.de/bayern/steigerwaldbahn-kitzingen-schweinfurt-verkauf-1.4475624*
- Klimaschutz: Grüne wollen München-Tourismus umweltverträglicher machen. (2019, May 07). Retrieved from *https://www.sueddeutsche.de/muenchen/tourismus-muenchen-umweltvertraeglicher-1.4434583*

- Grafiken: Wie sehr Fliegen dem Klima schadet. (2019, July 22). Retrieved from *https://www.sueddeutsche.de/wissen/klima-fliegen-co2-grafik-1.4534651*

DIE WELT

1. SPD will Geringverdiener mit „Klimaprämie" entlasten. (2019, July 20). Retrieved from *https://www.welt.de/politik/deutschland/video197165749/CO2-Bepreisung-SPD-will-Geringverdiener-mit-Klimapraemie-entlasten.html*
2. Klimapolitik wird zu großem Wahlkampfthema. (2019, May 04). Retrieved from *https://www.welt.de/politik/deutschland/video192951535/Landtags-und-Europawahlen-Klimapolitik-wird-zu-grossem-Wahlkampfthema.html*
3. Altmaier stellt sich gegen Steuerpläne seiner Ministerkollegin. (2019, July 07). Retrieved from *https://www.welt.de/politik/deutschland/article196467525/CO2-Bepreisung-Peter-Altmaier-stellt-sich-gegen-Steuerplaene-von-Svenja-Schulze.html*
4. „Die Zeit ist um – und das wird den Bürgern verheimlicht". (2019, May 03). Retrieved from *https://www.welt.de/vermischtes/article192867375/Maybrit-Illner-Die-Zeit-ist-um-und-das-wird-den-Buergern-verheimlicht.html*
5. In fünf Ministerien steigt die Zahl der Inlandsflüge. (2019, July 25). Retrieved from *https://www.welt.de/politik/article197403649/Bundesministerien-und-Behoerden-2018-rund-230-000-Inlandsfluege.html*
6. „Die Grünen sind politisch feige". (2019, June 07). Retrieved from *https://www.welt.de/politik/deutschland/plus194923361/Klaus-von-Dohnanyi-SPD-Die-Gruenen-sind-politisch-feige.html*
7. Grüne feiern Erfolge dank Klimaschutz? Bitte nicht so schlicht. (2019, May 29). Retrieved from *https://www.welt.de/debatte/kommentare/article194387053/Ole-von-Beust-Europawahl-Was-hinter-dem-Gruenen-Erfolg-steckt.html*
8. Die gespaltene Republik. (2019, May 27). Retrieved from *https://www.welt.de/politik/deutschland/article194253741/Europawahl-2019-Ergebnisse-zeigen-gespaltenes-Deutschland-Gruen-vs-AfD.html*
9. Konstanz beschließt als erste Stadt in Deutschland den Klimanotstand. (2019, May 02). Retrieved from *https://www.welt.de/politik/deutschland/article192862587/Fridays-for-Future-Konstanz-beschliesst-den-Klimanotstand.html*

10. Berliner AfD-Jugend rebelliert gegen Leugnung des Klimawandels. (2019, May 28). Retrieved from *https://www.welt.de/politik/deutschland/article194321453/Nach-Europawahl-Berliner-AfD-Jugend-gegen-Leugnung-des-Klimawandels.html*
11. Den Namen Volkspartei verdienen Union und SPD nicht. (2019, June 12). Retrieved from *https://www.welt.de/debatte/kommentare/article195098887/Klimapolitik-Den-Namen-Volkspartei-verdienen-Union-und-SPD-nicht.html*
12. AKK rudert im CDU-Streit um CO2-Steuer zurück. (2019, May 06). Retrieved from *https://www.welt.de/politik/deutschland/video193043721/Klimaschutz-AKK-rudert-im-CDU-Streit-um-CO2-Steuer-zurueck.html*
13. Unser Wald ist in Gefahr. Wir müssen jetzt handeln. (2019, July 31). Retrieved from *https://www.welt.de/debatte/kommentare/article197761543/Julia-Kloeckner-Unser-Wald-ist-in-Gefahr-Wir-muessen-jetzt-handeln.html*
14. Dem deutschen Wald muss geholfen werden. Aber richtig. (2019, July 08). Retrieved from *https://www.welt.de/debatte/kommentare/article196533095/Klimawandel-Aufforstung-Deutschem-Wald-muss-geholfen-werden.html*
15. Merkels Berater werten CO2-Steuer als „historische Chance". (2019, July 12). Retrieved from *https://www.welt.de/politik/deutschland/article196756649/Deutschlands-Klimaziele-Merkels-Berater-werten-CO2-Steuer-als-historische-Chance.html*
16. Klima-Aktivisten bilden Menschenkette um den Bundestag. (2019, June 28). Retrieved from *https://www.welt.de/politik/deutschland/article196061839/Fridays-for-Future-Klima-Aktivisten-bilden-Menschenkette-um-den-Bundestag.html*
17. Sollte der Mehrwertsteuersatz auf Bahntickets gesenkt werden?. (2019, July 29). Retrieved from *https://www.welt.de/politik/deutschland/article197640637/WELT-Trend-Sollte-der-Mehrwertsteuersatz-auf-Bahntickets-gesenkt-werden.html*
18. „Das ist nicht nur eine Kostenfrage, sondern auch eine Umweltfrage". (2019, July 25). Retrieved from *https://www.welt.de/politik/deutschland/video197425149/Inlandsfluege-der-Ministerien-Das-ist-nicht-nur-eine-Kostenfrage-sondern-auch-eine-Umweltfrage.html*
19. Die Schüler sind viel interessanter als Rezo. (2019, May 24). Retrieved from *https://www.welt.de/debatte/kommentare/article194112039/Rezo-Video-Die-Schueler-sind-viel-interessanter-als-der-YouTuber.html*

20. Neubauer fordert Abschaltung erster Kohlekraftwerke noch in diesem Jahr. (2019, July 06). Retrieved from *https://www.welt.de/politik/deutschland/article196455113/Fridays-for-Future-Luisa-Neubauer-fordert-Abschaltung-von-Kohlekraftwerken-noch-2019.html*

21. Warum Großbritannien für ganze Dörfer keine Rettung sieht. (2019, June 02). Retrieved from *https://www.welt.de/wirtschaft/plus194613195/Kuestenschutz-Grossbritannien-gibt-in-Wales-ganze-Doerfer-auf.html*

22. „Artenschutz ist Menschenschutz". (2019, May 06). Retrieved from *https://www.welt.de/wissenschaft/plus193017229/Artenvielfalt-Wie-Naturschutz-besser-funktionieren-kann.html*

23. Des Bauern Leid ist des Winzers Freud. (2019, June 25). Retrieved from *https://www.welt.de/wirtschaft/video195900049/Hitze-in-Deutschland-Des-Bauern-Leid-ist-des-Winzers-Freud.html*

24. „Klimaschutz ist nicht nur ein deutsches Problem". (2019, May 22). Retrieved from *https://www.welt.de/politik/deutschland/video193927897/Nicola-Beer-vor-der-Europawahl-Klimaschutz-ist-nicht-nur-ein-deutsches-Problem.html*

25. „Niemand muss sich schämen, wenn er mal in den Urlaub fliegt". (2019, July 31). Retrieved from *https://www.welt.de/politik/deutschland/article197723947/Klimadebatte-Niemand-muss-sich-schaemen-wenn-er-mal-in-den-Urlaub-fliegt.html*

26. Wie Jetstream und Emissionen die Dürre vorantreiben. (2019, May 01). Retrieved from *https://www.welt.de/wissenschaft/video192787217/Klimawandel-Wie-Jetstream-und-Emissionen-die-Duerre-vorantreiben.html*

27. „Es gibt keine Klimaschutzziele ohne Stadtplanung". (2019, June 07). Retrieved from *https://www.welt.de/politik/deutschland/article194948683/Bauen-Es-gibt-keine-Klimaschutzziele-ohne-Stadtplanung.html*

28. Deutsche halten Umweltschutz für größte Herausforderung der EU. (2019, May 12). Retrieved from *https://www.welt.de/politik/ausland/article193371401/WELT-Umfrage-Deutsche-halten-Umweltschutz-fuer-groesste-Herausforderung-der-EU.html*

29. Union zeigt sich offen für eine Klima-Maut. (2019, June 23). Retrieved from *https://www.welt.de/politik/deutschland/article195734667/Nach-EuGH-Urteil-Union-zeigt-sich-offen-fuer-Klima-Maut.html*

30. Wandeln auf dem schmalen Grat sozialverträglicher Klimapolitik. (2019, May 04). Retrieved from *https://www.welt.de/politik/ausland/article192918927/Umweltgipfel-in-Metz-Angst-vorm-Monatsende-vs-Angst-vorm-Weltende.html*

31. Altmaier äußert sich nach Treffen des Klimakabinetts. (2019, May 29). Retrieved from *https://www.welt.de/wirtschaft/video194401651/Deutschland-Altmaier-aeussert-sich-nach-Treffen-des-Klimakabinetts.html*

32. Rettet das Klima! Schaut keine Pornos!. (2019, July 18). Retrieved from *https://www.welt.de/debatte/kommentare/plus196901101/Fridays-for-Future-Rettet-das-Klima-Schaut-keine-Pornos.html*

33. 6000 gehen bei „Fridays for Future" in Hamburg auf die Straße. (2019, June 14). Retrieved from *https://www.welt.de/regionales/hamburg/article195268663/Schweigeminute-fuer-das-Klima-6000-gehen-bei-Fridays-for-Future-in-Hamburg-auf-die-Strasse.html*

34. Paradigmenwechsel bei der Hamburger Hochbahn. (2019, June 26). Retrieved from *https://www.welt.de/regionales/hamburg/article195943457/Mehr-Angebot-und-Komfort-Paradigmenwechsel-bei-der-Hamburger-Hochbahn.html*

UNREFERENCED ITEMS

- Häuptling Cardoso stellt die Greta-Frage. (2019, July 25). Retrieved from *https://www.welt.de/politik/ausland/plus197303815/Regenwald-in-Brasilien-Ein-Haeuptling-im-Kampf-gegen-Bolsonaro.html*
- Britisches Parlament ruft Klima-Notstand aus. (2019, May 02). Retrieved from *https://www.welt.de/politik/ausland/article192805103/Britisches-Parlament-ruft-Klima-Notstand-aus.html*
- „Allenfalls peripher an Klimaschutzaspekten interessiert". (2019, May 30). Retrieved from *https://www.welt.de/politik/video194450851/Hambacher-Forst-Allenfalls-peripher-an-Klimaschutzaspekten-interessiert.html*
- Wie Lobbyisten Europas Pläne für eine grünere Landwirtschaft blockieren. (2019, July 03). Retrieved from *https://www.welt.de/wirtschaft/article196216149/Agrarpolitik-Eine-starke-Lobby-blockiert-EU-Agrarreform.html*
- Was Greta Thunberg in den USA erwartet. (2019, July 30). Retrieved from *https://www.welt.de/wirtschaft/article197680703/Klimapolitik-Was-Greta-Thunberg-in-den-USA-erwartet.html*

- Briten sollen bis 2050 Treibhausgasausstoß komplett einstellen. (2019, May 03). Retrieved from *https://www.welt.de/wirtschaft/article192862017/CCC-Bericht-Briten-sollen-bis-2050-Treibhausgasausstoss-komplett-einstellen.html*
- An einem Punkt muss ich mein Experiment schlagartig beenden. (2019, June 23). Retrieved from *https://www.welt.de/finanzen/verbraucher/article195735011/Ein-Leben-ohne-echte-Milch-so-fuehlt-es-sich-an.html*
- Warftverstärkungen sollen Hallig-Zukunft sichern. (2019, July 05). Retrieved from *https://www.welt.de/regionales/hamburg/article196427519/Gegen-Blanken-Hans-Warftverstaerkungen-sollen-Hallig-Zukunft-sichern.html*
- Mit einer Spende die eigene Flugemission ausgleichen. (2019, July 19). Retrieved from *https://www.welt.de/vermischtes/video197100553/Umweltprojekt-Mit-einer-Spende-die-eigene-Flugemission-ausgleichen.html*
- Oberbürgermeister begründet Ausrufung des Klimanotstands. (2019, May 03). Retrieved from *https://www.welt.de/politik/deutschland/video192881269/Konstanz-am-Bodensee-Oberbuergermeister-begruendet-Ausrufung-des-Klimanotstands.html*
- So kaufen Sie sich ein gutes Klima-Gewissen. (2019, June 28). Retrieved from *https://www.welt.de/wirtschaft/plus195779437/Klimaschutz-Diese-Firmen-ermoeglichen-ein-gutes-Klima-Gewissen.html*
- Weiterhin Streit um CO2-Steuer - Schulze will 20 Euro pro Tonne. (2019, May 24). Retrieved from *https://www.welt.de/wirtschaft/video194136235/Treibhausgase-Weiterhin-Streit-um-CO2-Steuer-Schulze-will-20-Euro-pro-Tonne.html*
- Mit der Wasserstoff-Idee will Vaillant die Wärmewende schaffen. (2019, May 23). Retrieved from *https://www.welt.de/wirtschaft/article194010595/Mit-der-Wasserstoff-Idee-will-Vaillant-die-Waermewende-schaffen.html*
- Trump betont Amerikas führende Rolle in der Umweltpolitik. (2019, July 09). Retrieved from *https://www.welt.de/politik/video196558611/Wahlkampf-Kalkuel-Trump-betont-Amerikas-fuehrende-Rolle-in-der-Umweltpolitik.html*
- VW hält Verbrennungsmotor-Verbot ab 2025 für „utopisch". (2019, May 06). Retrieved from *https://www.welt.de/wirtschaft/video193053927/Saubere-Autos-VW-haelt-Verbrennungsmotor-Verbot-ab-2025-fuer-utopisch.html*
- Warum Ryanair seine Boeing 737 Max einfach umbenennt. (2019, June 06). Retrieved from *https://www.welt.de/wirtschaft/video194905039/Gamechanger-Warum-Ryanair-seine-Boeing-737-Max-einfach-umbenennt.html*

- In zwei Punkten ist die Koalition sich einig. (2019, May 15). Retrieved from *https://www.welt.de/politik/deutschland/video193516961/Koalition-einigt-sich-auf-Gesetze-zu-Paketbranche-und-Buerokratieabbau.html*
- Der vielleicht skurrilste Moment in Trumps Amtszeit. (2019, July 09). Retrieved from *https://www.welt.de/wirtschaft/article196558215/Umweltschutz-Rede-Der-vielleicht-skurrilste-Moment-in-Trumps-Amtszeit.html*
- Wie man die Apokalypse der Klimahysteriker überlebt. (2019, June 12). Retrieved from *https://www.welt.de/kultur/stuetzen-der-gesellschaft/plus195174175/Don-Alphonso-Wie-man-die-Apokalypse-der-Klimahysteriker-ueberlebt.html*
- Ryanair tauft Boeing 737 Max kurzerhand um. (2019, June 06). Retrieved from *https://www.welt.de/wirtschaft/article194888761/Unglueckslieger-Ryanair-tauft-Boeing-737-Max-in-737-Gamechanger-um.html*
- „Dass wir die Welt gerade grundlegend verändern, ist doch klar". (2019, June 15). Retrieved from *https://www.welt.de/wirtschaft/video195304329/Schokoladenhersteller-Dass-wir-die-Welt-gerade-grundlegend-veraendern-ist-doch-klar.html*

BILD ONLINE

1. Grünen-Politikerin fordert - Keine Inlandsflüge mehr ab 2038. (2019, June 21). Retrieved from *https://www.bild.de/politik/inland/politik-inland/inlands-fluege-verbot-gruenen-politikerin-will-kurzstrecken-verbieten-62780864.bild.html*
2. Hammer-Forderung im EU-Wahlkampf - Will uns Brüssel die Kurzstrecke wirklich verbieten?. (2019, May 17). Retrieved from *https://www.bild.de/geld/wirtschaft/politik-inland/europawahl-hammer-will-uns-bruessel-die-kurzstrecke-wirklich-verbieten-61970748.bild.html*
3. Grünen-Talk bei „Hart aber Fair" - „Auf dem Land wird Habeck als Bedrohung wahrgenommen". (2019, June 25). Retrieved from *https://www.bild.de/politik/inland/politik-inland/hart-aber-fair-talk-auf-dem-land-wird-habeck-als-bedrohung-wahrgenommen-62853362.bild.html*
4. EU-Wahlarena in der ARD - Offener Zoff um Klima- und Artenschutz. (2019, May 07). Retrieved from *https://www.bild.de/politik/inland/politik-inland/eu-wahlarena-in-der-ard-weber-und-timmermans-zoffen-sich-ums-klima-61751648.bild.html*

5. Standpunkt - Mehr Bahn wagen. (2019, July 20). Retrieved from *https://www.bild.de/politik/kolumnen/kolumne/standpunkt-mehr-bahn-wagen-63426962.bild.html*
6. Kohleausstieg schon 2030 - CSU-Chef Söder will den Klima-Turbo. (2019, June 22). Retrieved from *https://www.bild.de/politik/inland/politik-inland/kohle-ausstieg-bis-2030-csu-chef-markus-soeder-will-den-klima-turbo-62800722.bild.html*
7. Interview mit den FDP-Chefs - Liebe Liberale, wer braucht eigentlich die FDP?. (2019, July 28). Retrieved from *https://www.bild.de/politik/inland/politik-inland/fdp-christian-lindner-und-linda-teuteberg-im-bild-interview-63584014.bild.html*
8. CSU-Chef für Klimaschutz - Söder will Bahnfahren billiger machen. (2019, July 28). Retrieved from *https://www.bild.de/politik/inland/politik-inland/soeder-csu-chef-will-bahnfahren-billiger-machen-fuer-den-klimaschutz-63590114.bild.html*
9. *** BILDplus Inhalt *** Schule, Klima, Rente, Jobs - Wo die Politik GEGEN UNS arbeitet. (2019, June 02). Retrieved from *https://www.bild.de/bild-plus/politik/inland/politik-inland/schule-klima-rente-jobs-wird-politik-gegen-die-jungen-gemacht-62346126.bild.html*
10. Kommentar zum Youtuber-Video - Wut ist keine Lösung. (2019, May 24). Retrieved from *https://www.bild.de/politik/kolumnen/kolumne/youtuber-rezo-gegen-die-cdu-kommentar-wut-ist-keine-loesung-62164716.bild.html*
11. Klima-Zoff bei Lanz - Charlotte Roche geht auf Fleisch-Fans los. (2019, May 30). Retrieved from *https://www.bild.de/unterhaltung/tv/tv/charlotte-roche-bei-markus-lanz-blaest-sie-zur-klima-attacke-und-droht-mit-nackt-62296194.bild.html*
12. *** BILDplus Inhalt *** Essen, Klima, Umwelt - Dürfen Kinder unser Leben bestimmen?. (2019, June 16). Retrieved from *https://www.bild.de/bild-plus/ratgeber/2019/ratgeber/essen-klima-etc-duerfen-kinder-unser-leben-bestimmen-62648116.bild.html*
13. Klimawandel oder normal? - Streit um dieses Grönland-Foto. (2019, June 25). Retrieved from *https://www.bild.de/news/ausland/news-ausland/klimawandel-oder-normal-streit-um-dieses-groenland-foto-62860018.bild.html*
14. *** BILDplus Inhalt *** Flammen am Polarkreis - Wie die größten Brände der Erde das Klima verändern. (2019, July 16). Retrieved from *https://www.bild.de/bild-plus/news/ausland/news-ausland/waelder-rund-um-den-polarkreis-brennenund-sind-kaum-zu-loeschen-wie-die-groesste-63222826.bild.html*

15. Ist das schon Klimawandel? - Omega-Wetter lässt auf Grönland Eis schmelzen. (2019, May 15). Retrieved from *https://www.bild.de/news/ausland/news-ausland/klimawandel-omega-wetter-laesst-auf-groenland-eis-schmelzen-61891906.bild.html*

16. *** BILDplus Inhalt *** Brände und Dürre vernichten Bäume - Angst vor neuem Waldsterben!. (2019, July 27). Retrieved from *https://www.bild.de/bild-plus/news/inland/news-inland/duerre-und-braende-vernichten-baeume-angst-vor-neuem-waldsterben-63584036.bild.html*

17. *** BILDplus Inhalt *** Rackete redet von Klimaflucht - Gibt es tatsächlich so was wie Klima-Flüchtlinge?. (2019, July 15). Retrieved from *https://www.bild.de/bild-plus/politik/inland/politik-inland/fluechtlinge-gibt-es-tatsaechlich-so-was-wie-klima-fluechtlinge-63307660.bild.html*

18. *** BILDplus Inhalt *** Klimaforscher - Verzicht auf Fleisch rettet nicht die Welt. (2019, June 16). Retrieved from *https://www.bild.de/bild-plus/ratgeber/diaet/diaet/klimaforscher-verzicht-auf-fliegen-und-fleisch-rettet-nicht-die-welt-62648684.bild.html*

19. Was wird billiger, was teurer? - Klima-Kabinett berät über CO2-Preis. (2019, July 18). Retrieved from *https://www.bild.de/politik/inland/politik-inland/was-billiger-wird-was-teurer-wird-klima-kabinett-beraet-ueber-co2-preis-63371674.bild.html*

20. „Fridays for Future“ streikt vor dem EU-Parlament - Campen fürs Klima in Brüssel. (2019, May 26). Retrieved from *https://www.bild.de/politik/ausland/politik-ausland/eu-wahl-fridays-for-future-streikt-vor-dem-eu-parlament-62199054.bild.html*

21. Europawahl-Analyse - Klima verhagelt der GroKo die Wahl. (2019, May 26). Retrieved from *https://www.bild.de/politik/inland/politik-inland/europawahl-analyse-das-thema-klima-hat-der-groko-die-wahl-verhagelt-62194090.bild.html*

22. Bei Großdemo in Berlin - KLIMA-GRETA: „Ich werde nie aufgeben“. (2019, July 19). Retrieved from *https://www.bild.de/regional/berlin/berlin-aktuell/klimaaktivistin-greta-thunberg-in-berlin-ich-werde-nie-aufgeben-63397250.bild.html*

23. EU-Spitzenkandidaten - Kurzstreckenflüge sollen abgeschafft werden. (2019, May 17). Retrieved from *https://www.bild.de/politik/ausland/politik-ausland/europawahl-spitzenkandidaten-kurzstreckenfluege-sollen-abgeschafft-werden-61968748.bild.html*

24. *** BILDplus Inhalt *** Merkel-Berater zur Klimasteuer - „Am Ende zahlt der Bürger!“. (2019, July 12). Retrieved from *https://www.bild.de/bild-plus/politik/inland/politik-inland/klimasteuer-merkels-chefberater-gibt-zu-am-ende-zahlt-der-buerger-63265036.bild.html*
25. Als erste deutsche Millionenstadt - Köln ruft Klimanotstand aus. (2019, July 09). Retrieved from *https://www.bild.de/regional/koeln/koeln-regional-politik-und-wirtschaft/als-erste-deutsche-millionenstadt-koeln-ruft-klimanotstand-aus-63196618.bild.html*
26. Über den Atlantik - Greta Thunberg segelt im August nach Amerika. (2019, July 29). Retrieved from *https://www.bild.de/news/ausland/news-ausland/greta-thunberg-segelt-nach-amerika-reise-ueber-den-atlantik-im-august-63614998.bild.html*
27. Klimahaus erlebt Boom - Kinder werden Umwelt-Scouts. (2019, June 11). Retrieved from *https://www.bild.de/regional/bremen/bremen-aktuell/klimahaus-erlebt-boom-kinder-werden-umwelt-scouts-62529858.bild.html*
28. *** BILDplus Inhalt *** Malediven-Minister - „Uns droht der Untergang durch Überflutung“. (2019, June 09). Retrieved from *https://www.bild.de/bild-plus/politik/ausland/politik-ausland/klimawandel-und-malediven-aussenminister-warnt-vor-untergang-62443890.bild.html*
29. Klima-Aktivistin - Das steht in Greta Thunbergs Schulzeugnis. (2019, June 18). Retrieved from *https://www.bild.de/politik/ausland/politik-ausland/greta-thunberg-das-steht-nach-zehn-monaten-fridays-for-future-im-schulzeugnis-62701580.bild.html*

UNREFERENCED ITEMS

- Für eine bessere Klimapolitik - Däne (19) tritt in den Hungerstreik. (2019, May 11). Retrieved from *https://www.bild.de/politik/ausland/politik-inland/klimapolitik-19-jaehriger-aus-daenemark-tritt-in-den-hungerstreik-61834244.bild.html*
- *** BILDplus Inhalt *** Hunde im Schmelzwasser - Forscher erklärt sein verstörendes Grönland-Foto. (2019, June 19). Retrieved from *https://www.bild.de/bild-plus/news/ausland/news-ausland/hunde-im-schmelzwasser-forscher-erklaert-sein-groenland-foto-62724350.bild.html*
- Hitzige Debatte bei Demokraten - Sanders will „super aggressive“ Klima-Politik. (2019, July 31). Retrieved from *https://www.bild.de/politik/ausland/politik-ausland/hitzige-debatte-bei-demokraten-sanders-will-super-aggressive-klima-politik-63657452.bild.html*

- Nach Spruch gegen Bauer - Morddrohung gegen Berliner Grünen-Politiker. (2019, June 26). Retrieved from *https://www.bild.de/regional/berlin/berlin-aktuell/morddrohungen-gegen-berliner-gruenen-politiker-nach-moehren-spruch-62896500.bild.html*
- Für Haltung zum Klimaschutz - Karlspreis an UN-Generalsekretär verliehen. (2019, May 30). Retrieved from *https://www.bild.de/regional/koeln/koeln-aktuell/aachen-karlspreis-an-un-generalsekretaer-guterres-verliehen-62298718.bild.html*
- Millionen Lachse erstickt - Führt der Klimawandel zu tödlicher Algenblüte?. (2019, May 26). Retrieved from *https://www.bild.de/news/ausland/news-ausland/lachssterben-in-norwegen-fuehrt-klimawandel-zu-toedlicher-algenbluete-62192336.bild.html*
- Terminator trifft Greta - „Yes we can" Klima retten!. (2019, May 28). Retrieved from *https://www.bild.de/politik/ausland/politik-ausland/klima-konferenz-in-wien-terminator-rettet-das-klima-yes-we-can-62236920.bild.html*
- „Fridays for Future" - Bußgeld für streikende Schüler aufgehoben. (2019, July 18). Retrieved from *https://www.bild.de/regional/frankfurt/frankfurt-aktuell/fridays-for-future-bussgeld-fuer-streikende-schueler-aufgehoben-63380542.bild.html*
- Europawahl – alle Ergebnisse - In der Heimat von Klima-Greta verlieren die Grünen. (2019, May 26). Retrieved from *https://www.bild.de/politik/ausland/politik-ausland/europawahl-schweden-ergebnis-der-wahl-zum-eu-parlament-im-detail-61823830.bild.html*
- Klima-Talk - Axel-Springer-Chef und „Fridays for Future"-Aktivistin. (2019, July 03). Retrieved from *https://www.bild.de/politik/inland/politik-inland/klima-talk-fridays-for-future-aktivistin-und-axel-springer-chef-63067980.bild.html*
- Grünen-Chefin über Kanzlerin - Klimawandel Mitschuld an Merkels Zitteranfällen. (2019, June 28). Retrieved from *https://www.bild.de/politik/inland/politik-inland/gruenenchefin-baerbock-klimawandel-mitschuld-an-merkels-zitteranfaellen-62958884.bild.html*
- Vier effektive Maßnahmen! - So kann jeder Einzelne zum Klima-Helfer werden. (2019, May 31). Retrieved from *https://www.bild.de/ratgeber/wissenschaft/ratgeber/so-kann-jeder-zum-klima-helfer-werden-vier-effektive-massnahmen-62322962.bild.html*

- *** BILDplus Inhalt *** Weil Studien oft schwer verständlich sind - Der Klimawandel in Grafiken erklärt. (2019, July 20). Retrieved from *https://www.bild.de/bild-plus/news/ausland/news-ausland/klimawandel-in-grafiken-erklaert-weil-studien-oft-schwer-verstaendlich-sind-63097474.bild.html*
- *** BILDplus Inhalt *** DAS soll also Klimaschutz sein - Aktivisten aus Hambacher Forst zertrampeln Feld. (2019, July 12). Retrieved from *https://www.bild.de/bild-plus/regional/koeln/koeln-aktuell/video-beweis-oeko-aktivisten-aus-dem-hambacher-forst-ein-maisfeld-63241562.bild.html*
- Klima-Proteste in Garzweiler - Aktivisten dringen in Tagebau ein!. (2019, June 22). Retrieved from *https://www.bild.de/regional/koeln/koeln-aktuell/klima-proteste-in-garzweiler-nrw-aktivisten-dringen-in-tagebau-ein-62803092.bild.html*
- Miley Cyrus legt sich fest - Keine Kinder wegen des Klimawandels. (2019, July 12). Retrieved from *https://www.bild.de/unterhaltung/leute/leute/miley-cyrus-legt-sich-fest-keine-kinder-wegen-des-klimawandels-63245764.bild.html*
- Kanzleramts-Chef live bei BILD - Steuern, Klima, Rente: SO lief der GroKo-Gipfel. (2019, June 16). Retrieved from *https://www.bild.de/politik/inland/politik-inland/kanzleramts-chef-braun-steuern-klima-rente-so-lief-der-groko-gipfel-62668236.bild.html*
- Carola Rackete im Interview. (2019, July 14). Retrieved from *https://www.bild.de/video/clip/carola-rackete/carola-rackete-im-interview-ueber-seenot-rettung-63283558,auto=false.bild.html*
- Ernährung - Ist regionales Obst wirklich besser fürs Klima?. (2019, July 21). Retrieved from *https://www.bild.de/ratgeber/diaet/diaet/ernaehrung-ist-regionales-obst-wirklich-besser-fuers-klima-63421748.bild.html*
- *** BILDplus Inhalt *** 48 Stunden in Malmö - Öko-Stadt am Öresund. (2019, May 31). Retrieved from *https://www.bild.de/bild-plus/reise/europa/reise-europa/48-stunden-in-malmoe-insider-tipps-fuer-die-oeko-stadt-am-oeresund-62133322.bild.html*
- DIE BILD-EU-RESOLUTION - Was sich wirklich in der EU ändern müsste!. (2019, July 16). Retrieved from *https://www.bild.de/politik/kolumnen/politik-ausland/die-bild-eu-resolution-diese-10-probleme-muessen-schnell-geloest-werden-63335610.bild.html*
- BILD traf Kerstin Langenberger - Diese Fotografin knipste den „Klima-Eisbären“. (2019, June 05). Retrieved from *https://www.bild.de/news/ausland/news-ausland/kerstin-langenberger-fotografierte-den-sterbenden-klima-eisbaeren-62419880.bild.html*

- Riesen-Ärger über Müllberge - Klima retten? Aber nicht bei Open-Air-Festivals!. (2019, June 12). Retrieved from *https://www.bild.de/politik/inland/politik-inland/rock-im-park-klima-retten-aber-nicht-bei-open-air-festivals-62583926.bild.html*

HUFFINGTON POST

30. Green New Deal Emerges As Wedge Issue On Climate Change In Democratic Debate. (2019, July 31). Retrieved from *https://www.huffpost.com/entry/green-new-deal-democratic-debate_n_5d40fc03e4b0db8affb01462*
31. Sanders, Ocasio-Cortez To Propose Bill To Declare Climate Emergency. (2019, July 08). Retrieved from *https://www.huffpost.com/entry/bernie-aoc-climate_n_5d23af9ce4b07e698c3f9495*
32. Green New Dealers Find A New Villain In Biden's Climate 'Middle Ground'. (2019, May 14). Retrieved from *https://www.huffpost.com/entry/joe-biden-climate-middle-ground_n_5cda3572e4b073aa0b329d86*
33. Joe Biden Earns Near-Flunking Score On Climate Group's Report Card. (2019, May 30). Retrieved from *https://www.huffpost.com/entry/2020-greenpeace-climate-candidate-rating_n_5cf00df7e4b0e346ce7aafdb*
34. Democrats Spent Less Than 10 Minutes Talking About Climate At First Debate. (2019, June 27). Retrieved from *https://www.huffpost.com/entry/democratic-debate-2020-climate-change_n_5d143a8de4b0e45560375f92*
35. DNC To Consider Climate Debate Amid Mounting Pressure. (2019, July 01). Retrieved from *https://www.huffpost.com/entry/dnc-climate-debate_n_5d1a5df7e4b082e5536de208*
36. Jay Inslee Says DNC Has Officially Refused His Demands For A Climate Debate. (2019, June 05). Retrieved from *https://www.huffpost.com/entry/dnc-climate-change-debate-jay-inslee_n_5cf8355de4b0638bdfa4206a*
37. DNC Members Push For Climate-Centered Presidential Debate. (2019, June 07). Retrieved from *https://www.huffpost.com/entry/dnc-letter-tom-perez-2020-primary-climate-change-debate_n_5cfa9a4ee4b0aab91c058622*
38. Panicked Carmakers Plead With Trump Not To Dismantle Auto Pollution Standards. (2019, June 08). Retrieved from *https://www.huffpost.com/entry/automakers-trump-emission-standards_n_5cfae636e4b0aab91c0643de*
39. World Headed For 'Climate Apartheid,' UN Expert Warns. (2019, June 25). Retrieved from *https://www.huffpost.com/entry/united-nations-report-climate-poverty-2019-philip-alston_n_5d1251e0e4b0aa375f544e17*

40. Climate Record Blocked Because It Didn't 'Jibe' With Trump's View: Report. (2019, June 08). Retrieved from *https://www.huffpost.com/entry/trump-catastrophic-climate-change-testimony_n_5cfb3eefe4b04e90f1c9b942*

41. Joe Biden Pushes Back On Criticism Of Climate Change Approach. (2019, May 13). Retrieved from *https://www.huffpost.com/entry/joe-biden-climate-change-record-middle-ground_n_5cd9c5bae4b0f7ba48a93ef6*

42. The Trouble With Mercedes-Benz's Historic New Climate Goals. (2019, May 13). Retrieved from *https://www.huffpost.com/entry/daimler-mercedes-benz-climate_n_5cd89a97e4b0705e47de325c*

43. Interior Chief Can't Shake Comment About Not Losing Sleep Over Climate Change. (2019, May 23). Retrieved from *https://www.huffpost.com/entry/david-bernhardt-climate-change-sleep_n_5ce5caa9e4b0db9c29929b53*

44. Fight Over Oregon Climate Change Bill Erupts In Chaos After GOP Walks Out. (2019, June 20). Retrieved from *https://www.huffpost.com/entry/oregon-senate-walk-out_n_5d0be589e4b07ae90d9a5259*

45. A Climate Plan Even Exxon Could Love. (2019, June 11). Retrieved from *https://www.huffpost.com/entry/climate-plan-exxon-liability_n_5cfea3f6e4b02ee3477b3885*

46. Montana Gov. Steve Bullock Faces An Uphill Battle With Climate Hawks. (2019, May 22). Retrieved from *https://www.huffpost.com/entry/steve-bullock-climate-change_n_5ce57378e4b09b23e65c53f1*

47. Ocasio-Cortez Mocks 'No Ideas' GOP With 'Game Of Thrones'-Themed Space Plan. (2019, May 10). Retrieved from *https://www.huffpost.com/entry/alexandria-ocasio-cortez-republican-gop-lack-ideas_n_5cd52173e4b0796a95d94da8*

48. Biden's Rivals In Democratic Race Reject His 'Middle Ground' On Climate Policy. (2019, May 12). Retrieved from *https://www.huffpost.com/entry/joe-biden-democratic-rivals-climate-change-middle-ground_n_5cd828dce4b054da4e8af616*

49. Interior Chief On Soaring Atmospheric Carbon Dioxide: 'I Haven't Lost Any Sleep'. (2019, May 15). Retrieved from *https://www.huffpost.com/entry/david-bernhardt-climate-change-carbon-dioxie_n_5cdc596ce4b0337da4ac5499*

50. Interior Chief Blames Congress For His Inaction On Climate Change. (2019, May 08). Retrieved from *https://www.huffpost.com/entry/david-bernhardt-interior-secretary-climate-change-extinction_n_5cd1f3c9e4b0a7dffcce0468*

51. EPA Air Chief Gave Presentation At Fringe Climate Denier Event, New Emails Show. (2019, June 14). Retrieved from *https://www.huffpost.com/entry/epa-climate-denier_n_5d03f660e4b0985c419d7e8b*

52. U.S. Energy Department Rebrands Gas Exports 'Molecules Of Freedom'. (2019, May 30). Retrieved from *https://www.huffpost.com/entry/energy-department-freedom-gas_n_5cefd516e4b00cfa196718be*

53. Trump Deals Final Blow To Clean Power Plan, Obama's Signature Climate Policy. (2019, June 19). Retrieved from *https://www.huffpost.com/entry/trump-coal-epa-energy-plan_n_5d095fa5e4b0f7b74428a1f9*

54. Trump To Spin Environmental Record In White House Speech. (2019, July 08). Retrieved from *https://www.huffpost.com/entry/trump-environmental-spech-record_n_5d237cbee4b01b83473ad5c4*

55. Dems Want To Declare Climate Emergency, Don't Worry About The Right Co-Opting It. (2019, July 10). Retrieved from *https://www.huffpost.com/entry/climate-emergency-democrats-congress_n_5d2609ede4b0583e482aaa11*

56. Jay Inslee Unveils Stunningly Detailed $9 Trillion Climate Jobs Plan. (2019, May 16). Retrieved from *https://www.huffpost.com/entry/jay-inslee-jobs_n_5cdc8ae4e4b09648227aae06*

57. Bernie Sanders Slams Democrats 'Afraid Of Big Ideas' On Climate Change. (2019, July 31). Retrieved from *https://www.huffpost.com/entry/bernie-sanders-democratic-debate-climate-change_n_5d40f025e4b0db8affaffe92*

UNREFERENCED ITEMS

- Four Automakers Strike Emissions Deal With Ca., Defying Trump's Opposition. (2019, July 25). Retrieved from *https://www.huffpost.com/entry/automakers-strike-emissions-deal-california_n_5d399dede4b004b6adbbd031*
- Bill Nye, John Oliver Burn GOP On Climate Change. (2019, May 13). Retrieved from *https://www.huffpost.com/entry/john-oliver-bill-nye-climate-change_n_5cd91623e4b054da4e8c154b*
- Hackers Held Radiohead Music For Ransom. The Band Turned It Into Climate Action.. (2019, June 11). Retrieved from *https://www.huffpost.com/entry/radiohead-stolen-music-climate-change_n_5cffcf49e4b0a39a4e959c5c*
- Plastics Aren't Just Polluting – They're Making Climate Change Worse. (2019, May 16). Retrieved from *https://www.huffpost.com/entry/plastic-climate-change_n_5cdd8f4be4b09648227ca194*

- UN Chief Warns World Is 'Not On Track' To Meet Climate Change Targets. (2019, May 12). Retrieved from *https://www.huffpost.com/entry/antonio-guterres-climate-change-new-zealand_n_5cd7e153e4b0705e47dd820d*
- Jay Inslee Tops New Ranking Of 2020 Candidates' Climate Proposals. (2019, July 01). Retrieved from *https://www.huffpost.com/entry/2020-climate-ranking_n_5d1a320ce4b07f6ca5819cd9*
- Merkel Tells Harvard Grads To 'Tear Down Walls Of Ignorance' in Trump Rebuke. (2019, May 31). Retrieved from *https://www.huffpost.com/entry/german-chancellor-angela-merkel-harvard-walls-trump_n_5cf09696e-4b0a1997b67e18d*
- Precious Brady-Davis Is Connecting The Dots. (2019, June 05). Retrieved from *https://www.huffpost.com/entry/precious-brady-davis-climate-change-environment-trans_n_5cca0b47e4b0e4d7572d2e52*
- Pink Floyd's David Gilmour Sells 126 Guitars For Climate Change In Huge Auction. (2019, June 21). Retrieved from *https://www.huffpost.com/entry/pink-floyd-david-gilmour-guitar-auction-climate-change_n_5d0cf610e-4b07ae90d9c4e93*

ABC NEWS

1. Climate experts' top 3 questions for the Democratic candidates. (2019, July 30). Retrieved from *https://abcnews.go.com/Politics/climate-experts-top-questions-democratic-candidates/story?id=64661028*
2. Ocasio-Cortez goes after Joe Biden's reported 'middle ground' climate change policy. (2019, May 14). Retrieved from *https://abcnews.go.com/Politics/ocasio-cortez-ramps-attacks-bidens-reported-middle-ground/story?id=63024980*
3. EPA finalizes power plant rules to replace Obama's signature climate change policy. (2019, June 19). Retrieved from *https://abcnews.go.com/Politics/epa-finalizes-power-plant-rules-replace-obamas-signature/story?id=63791842*
4. Gov. Jay Inslee unveils sweeping initiative to combat climate change. (2019, May 03). Retrieved from *https://abcnews.go.com/Politics/gov-jay-inslee-unveils-sweeping-initiative-combat-climate/story?id=62768393*
5. Trump says 'We only have one planet' as administration continues to roll back regs. (2019, July 08). Retrieved from *https://abcnews.go.com/Politics/trump-claim-environmental-leadership-speech/story?id=64189763*

6. UN chief warns Paris climate goals still not enough. (2019, June 30). Retrieved from *https://abcnews.go.com/International/wireStory/chief-warns-paris-climate-goals-64047151*
7. Medical groups warn climate change is a 'health emergency'. (2019, June 24). Retrieved from *https://abcnews.go.com/Technology/wireStory/medical-groups-warn-climate-change-health-emergency-63903687*
8. Paris sizzles, London boils as record heat threatens Europe. (2019, July 25). Retrieved from *https://abcnews.go.com/Lifestyle/wireStory/paris-sizzles-london-boils-record-heat-threatens-europe-64556301*
9. Democrats conflate weather and climate change in bids for 2020 nomination. (2019, June 01). Retrieved from *https://abcnews.go.com/Politics/democrats-conflate-weather-climate-change-bids-2020-nomination/story?id=63397538*
10. 2020 candidates move to the left as climate change emerges as campaign issue. (2019, June 07). Retrieved from *https://abcnews.go.com/Politics/2020-democratic-candidates-move-left-progressive-climate-change/story?id=63489543*
11. Oregon Republican senators end walkout over carbon bill. (2019, June 29). Retrieved from *https://abcnews.go.com/Politics/wireStory/oregon-senate-republicans-end-walkout-carbon-bill-64037995*
12. Still no sign of Oregon Republicans who walked out amid climate change vote. (2019, June 26). Retrieved from *https://abcnews.go.com/Politics/sign-oregon-republicans-walked-amid-climate-change-vote/story?id=63957998*
13. What to expect from 2nd night of Democratic debates. (2019, July 31). Retrieved from *https://abcnews.go.com/Politics/democratic-debates-2019-expect-night-2nd-debates/story?id=64630802*
14. 'Molecules of freedom': US Energy Department tries rebranding natural gas. (2019, May 30). Retrieved from *https://abcnews.go.com/Politics/molecules-freedom-us-energy-department-rebranding-natural-gas/story?id=63366255*
15. WATCH: Oregon State Police called to bring GOP senators back for climate vote. (2019, June 24). Retrieved from *https://abcnews.go.com/Politics/video/oregon-state-police-called-bring-republican-senators-back-63912136*

16. Republican senators go into hiding over state's climate change vote. (2019, June 23). Retrieved from *https://abcnews.go.com/US/oregons-republican-state-senators-hiding-democrats-delay-climate/story?id=63880562*
17. Oregon governor ready to take lead on divisive climate plan. (2019, July 01). Retrieved from *https://abcnews.go.com/Politics/wireStory/oregon-governor-ready-lead-divisive-climate-plan-64069863*
18. Former Vice President Joe Biden to lay out his vision on foreign policy. (2019, July 11). Retrieved from *https://abcnews.go.com/Politics/vice-president-joe-biden-lay-vision-foreign-policy/story?id=64253978*

UNREFERENCED ITEMS

- Green parties' gains could boost climate action in Europe. (2019, May 28). Retrieved from *https://abcnews.go.com/Technology/wireStory/green-wave-europe-wakes-climate-concerns-vote-63300796*
- Climate change protesters arrested outside New York Times. (2019, June 22). Retrieved from *https://abcnews.go.com/US/wireStory/climate-change-protesters-arrested-york-times-63885179*
- Dem debate near Flint brings attention to water issues, inequality. (2019, July 30). Retrieved from *https://abcnews.go.com/Politics/democratic-debate-detroit-brings-attention-water-issues-inequality/story?id=64643546*

FOX NEWS

1. AOC says only a 'sea sponge' would believe her '12 days' doomsday remark, but most Dems bought it. (2019, May 23). Retrieved from *https://www.foxnews.com/politics/ocasio-cortez-doomsday-claim-world-end-poll-shows-67-percent-of-dems*
2. Biden defends his climate record after Ocasio-Cortez criticism, tells critics to 'calm down'. (2019, May 14). Retrieved from *https://www.foxnews.com/politics/biden-defends-his-climate-record-after-ocasio-cortez-criticism-tells-critics-to-calm-down*
3. Justin Haskins: Pelosi, others want to see Trump 'in prison.' Will the left ever stop weaponizing government?. (2019, June 10). Retrieved from *https://www.foxnews.com/opinion/justin-haskins-pelosi-others-want-to-see-trump-in-prison-will-the-left-ever-stop-weaponizing-government*

4. AOC's top aide admits Green New Deal about the economy, not climate. (2019, July 12). Retrieved from *https://www.foxnews.com/politics/aocs-top-aide-admits-green-new-deal-about-the-economy-not-the-climate*
5. Oregon Senate closes due to 'possible militia threat' after Republican walkout. (2019, June 22). Retrieved from *https://www.foxnews.com/politics/oregon-senate-closes-due-to-possible-militia-threat-after-republican-walkout*
6. Dem senator warns Trump's Florida estate will soon be underwater: 'It's going to be Mar-a-Lagoon'. (2019, April 30). Retrieved from *https://www.foxnews.com/politics/dem-senator-warns-trumps-florida-estate-will-soon-be-underwater-its-going-to-be-mar-a-lagoon*
7. Today's climate change is worse than anything Earth has experienced in the past 2,000 years. (2019, July 29). Retrieved from *https://www.foxnews.com/science/todays-climate-change-is-worse-than-anything-earth-has-experienced-in-the-past-2000-years*
8. Bill Nye says world needs to respond to climate change like it did with D-Day. (2019, June 06). Retrieved from *https://www.foxnews.com/entertainment/bill-nye-world-climate-change-d-day*
9. US says Trump coal moves hasten but don't increase emissions. (2019, May 22). Retrieved from *https://www.foxnews.com/us/us-says-trump-coal-moves-hasten-but-dont-increase-emissions*
10. AOC called out by meteorologist after linking DC tornado warning to climate change. (2019, May 24). Retrieved from *https://www.foxnews.com/politics/aoc-dc-tornado-warning-links-climate-change*
11. Liz Peek: To triumph in 2020, Republicans will need to win over millennials – Here's how to do it. (2019, June 03). Retrieved from *https://www.foxnews.com/opinion/liz-peek-2020-republicans-millennials-climate-change*
12. Reindeer are eating seaweed to survive climate change, scientists say. (2019, May 04). Retrieved from *https://www.foxnews.com/science/reindeer-eating-seaweed-climate-change*
13. UN report warns coming 'climate apartheid' will split Earth between 'those who escape' and 'those who will suffer'. (2019, June 27). Retrieved from *https://www.foxnews.com/science/un-report-climate-apartheid-earth*
14. Paul Saunders: The surprising G20 climate fight with China. (2019, July 07). Retrieved from *https://www.foxnews.com/opinion/paul-saunders-the-surprises-of-the-g20-climate-fight-with-china*

15. Climate change could raise sea levels by 7 feet by 2100, shocking study reveals. (2019, May 21). Retrieved from *https://www.foxnews.com/science/climate-change-sea-levels-rise*
16. 'Transformative changes' are needed to save nature and ourselves, major climate report claims. (2019, May 05). Retrieved from *https://www.foxnews.com/science/transformative-changes-nature-climate-report*
17. Joe Bastardi: Green New Deal is a recipe for economic disaster that would hurt every American. (2019, May 11). Retrieved from *https://www.foxnews.com/opinion/joe-bastardi-green-new-deal-is-a-recipe-for-economic-disaster-that-would-hurt-every-american*

UNREFERENCED ITEMS

- UK climate panel sets big goals: less meat, drive electric. (2019, May 01). Retrieved from *https://www.foxnews.com/world/uk-climate-panel-sets-big-goals-less-meat-drive-electric*
- Climate activists convicted for removing Macron portrait. (2019, June 12). Retrieved from *https://www.foxnews.com/world/climate-activists-convicted-for-removing-macron-portrait*
- Activists block Holland American Cruise ship to protest pollution: 'Cruises kill climate'. (2019, June 10). Retrieved from *https://www.foxnews.com/travel/cruise-ship-blocked-protest-pollution*
- Teen activist Thunberg urges leaders to admit climate crisis. (2019, May 28). Retrieved from *https://www.foxnews.com/world/teen-activist-thunberg-urges-leaders-to-admit-climate-crisis*
- Youth wing urges German far right to change tack on climate. (2019, May 28). Retrieved from *https://www.foxnews.com/world/youth-wing-urges-german-far-right-to-change-tack-on-climate*
- Rains like no other: Iraq is tested in era of climate change. (2019, May 02). Retrieved from *https://www.foxnews.com/world/rains-like-no-other-iraq-is-tested-in-era-of-climate-change*
- Climate change is hot topic in the European Parliament vote. (2019, May 24). Retrieved from *https://www.foxnews.com/world/climate-change-is-hot-topic-in-the-european-parliament-vote*

- Australia's opposition leader campaigns on health, climate. (2019, May 05). Retrieved from *https://www.foxnews.com/world/australias-opposition-leader-campaigns-on-health-climate*
- Pope warns oil execs of need for "rapid" energy transition. (2019, June 14). Retrieved from *https://www.foxnews.com/world/pope-warns-oil-execs-of-need-for-rapid-energy-transition*
- Ethiopia plants world-record 350 million trees in 12 hours, officials say. (2019, July 30). Retrieved from *https://www.foxnews.com/world/ethiopia-climate-change-planting-trees-world-record*
- Climate activists on trial for taking down Macron portraits. (2019, May 28). Retrieved from *https://www.foxnews.com/world/climate-activists-on-trial-for-taking-down-macron-portraits*

Table 3B.1:

Portrayals by Fox News

Group	Labels	Behaviours
The political left	**Green new dealers** Ocasio-Cortez[1,4,6,10]; Markey[6]; O'Rourke[6]; Warren[8]	lie to their own supporters[1]; use apocalyptic language[6]; want to end the debate on climate change[6]; link tornado warnings to CC[10]; discredit their opponents[17]; would send the economy into depression[17]
	Democrats[1,3,8]; Biden[2]; Oregon Democrats[5]; mainstream Dems[6]; Dem attorney generals[9]	want to prosecute people that don't believe in climate change[3]: sue the Trump Administration[9]; threaten to use police against Republican lawmakers[5]; promote climate hysteria[8]; sue to reinstate coal moratorium[9]
	Environmental activists env. alarmists[17]	sue to reinstate coal moratorium[9]; are happy to fear monger[17]
The political right	**Republicans** McConnel[4] Oregon Republicans[5]; DeSantis[11]	mock AOC for doomsday warnings[1]; oppose socialism[4]; walk out from legislature to protest cap and trade[5]; wins voters by enacting environmental protection[11]
	Trump Administration Donald Trump[13]	does not mention climate change as environmental threat[5]; lifts moratorium on coal mining[9]; withdraws from Paris Agreement[14]
Young protestors/ citizens	**Young democrats** Millenials[8,11]; young voters[11]	

Objects of Knowledge	Policy Positions
acting on CC is a moral question[1]; CC drives migration[1]; there is no middle ground on climate change[2]; the New Deal will create millions of jobs and reduce inequality[4]; CC will set parts of Florida underwater[6]; CC is biggest challenge for humanity[8]; climate change causes tornado patterns to shift[10]; climate crisis is real[10]; adopting Draconian measures will serve as a global example[17]	the Green New Deal[1,10]; a radical reorganisation of the entire economy[1,4]; provide prosperity and economic security to all Americans[4], 100% renewables[4]; a 100% job guarantee[4]; government-focused policies[6]; take money from rich people[8]; massive tax expansion[17]
mostly believe the world has 12 years to act on CC[1];	support the Green New Deal[1,6]; a Green revolution[2]; cap and trade to reduce emissions[5];
believe the world will end in a few years[17]	mining on public lands should be prohibited[9]
the Green new deal is a socialist top-down make-over of the economy[4]; cap and trade laws will irrep-arably damage rural citizens[5]; skeptical about CC[6]	promote environmental protection[11]; oppose cap and trade bills[5]; oppose government centred policies[6]
lifting coal moratorium will not increase long-term emissions[9]; "weather changes both ways"13; the US has the cleanest climate[13]	
think climate change is the number one issue[8]; see climate change as real threat[11]; don't value rational debates or cost-benefit analyses[11]; are unim-pressed by US leaders in emissions reductions[11]	want action on climate change[11]

Table 3B.2:

Portrayals by ABC News

Outlet	Labels	Behaviours
The political left	**Democrats** AOC[2,4a], Green New Deal backers[2,4b,7]; Biden[2a,10b,18]; democratic candidates[4,9,13]; Gina McCarthy[3]; Jay Inslee[10]	devote little time to debating CC[1]; fight over climate change policy[2,13]; attack Trump Administration for toothless climate rules[3]; reveal climate protection plans[4]; conflate weather and climate[9]; make CC important for their campaigns[9]; advocate for CC to be on the democratic agenda[10]; calls for environmental justice[10b]; attack Trump for climate science denial[13]
	Oregon democrats	Order state police to retrieve republican lawmakers[11]
The political right	**Trump Administration** Donald Trump[6]	withdraws from the Paris agreement[1,4,5,6,7]; replaces Obama's Clean Power Plan[3]; conflates weather and climate[9]; claims to protect the dreams of the poorest Americans[5]; is playing on tough on climate change[14]; label natural gas as 'freedom gas'[14]
	Republicans Zycher[1]; Oregon Republicans[11]	walk out over climate legislation[11,12,15,16,17]; break promise not to walk out again[11,12]
Young people	**young people**[4,10]	are politically engaged[4]

Objects of Knowledge	Policy Positions
CC is top issue[1]; CC is a geopolitical threat[1]; Oppose a middle ground on CC[2,10]; CC is an existential threat[2,2a,4,10,13]; the EPA's current policies are not doing enough[3]; CC is a potential disaster[4]; CC needs urgent action[10,13]; climate migration needs to be studied[10]; climate change is a global threat[18]	the Green new deal[2,4a,13]; re-joining the Paris Agreement[2a,4,10,13]; efficiency and emissions standards[2a]; redesign of the economy, infrastructure, education, and health care[2,4b,10,13]; a ban on fracking[7]; make the US an international leader on CC[10,18]; end fossil fuel subsidies[10]; achieve net zero emissions by 2050[10b]
cap and trade would create jobs and transform the economy[11,17]; using executive power to reduce emissions is justified[17]	cap and trade bill[11,17]
Affordable Clean Energy rule will still reduce emissions[3]; shutting down coal plants exceeds EPA's authority[3]; the ACE is more effective than the CPP[3]; evironmental regulations punish workers[5]; the GND would cost 100trillion dollar[5]; doubt that CC would cause harm to the US[5]; the Paris Agreement disadvantages US workers[6]; natural gas is affordable and clean[14]	reduce emissions with goals set by states[3]; develop clean coal technologies[3]; opposed to the Green New Deal[5]; reversal of Obama-era environmental and climate policies[5,6]; environmental protection[5]; promoting energy security and diversity worldwide[14]; promote natural gas production[14]
Democratic proposals would only have negligible impact[1]; cap and trade will wreak havoc on truckers and loggers[11]; cap and trade is bad for business[12,17]	oppose cap and trade bills[11,16]; opposition to rising fuel prices[16,17]
	prioritise climate change mitigation over economic growth[4,10]

Table 3B.3:

Portrayals by Huffington Post

Outlet	Labels	Behaviours
The political left	**Democrats** Democrat voters; the Democratic National Committee[5,6,7]; DNC members[8]; Oregon Democrats[15]	refrain from organising a debate on CC[5,7]; debates whether to hold a debate on CC[6]; authorise police to end Republican walk-out over climate bill[15];
	Progressive candidates AOC[3,18]; Inslee[4,6,7,19,27]; Sanders[19,28]	introduce bill to declare CC and emergency[2]; try to raise CC as an issue at Democratic debates[5]; demands debate on CC[7]; attack Trump Administration officials for being oil and gas lobbyists[14,23]; accuse Republicans for lack of ideas[18]; attack Biden for promoting a middle ground[19]; attack the EPA for neglecting its duty to regulate carbon emissions[24]; want to declare CC an emergency without giving the Administration more power[26]; criticise moderate democrats[28];
	Centrist candidates Joe Biden[3,12,19,27]; Steve Bullock[17]	accuse GND supporters of demonizing coal workers[1]; cites PolitiFact evidence to be a climate pioneer[12]; promote a middle ground[27]
	Activists Unions[1b] Extinction Rebellion[2]; Sunrise Movement[3,5,17]; Greenpeace[4]	protest for a GND[1,5]; occupy Democratic offices in Washington[3]; gives candidates an environmental-friendliness score[4]; lobby for a Democratic debate on CC[8]; ridicule the Administration for calling natural gas 'freedom gas'[23]
The political right	**Republicans** former Republican secretaries of State[16]	reject the scientific consensus on CC[24]
	The Trump Administration Donald Trump[11a,25]; David Bernhardt[20,21]; Bill Wehrum[22]	blocks State Department analysts from submitting testimony[11]; compare demonisation of carbon dioxide to prosecution of Jews[11]; is not losing sleep over CC[14]; downplays the threat of climate change[17]; give presentations at climate denier events[21]; label natural gas as clean energy[23]
Young people	**the Sunrise Movement** young Democrats[19]	protest for the Green New Deal[1,5]; criticise mainstream democrats[17]; oppose a middle ground [19]

Objects of Knowledge	Policy Positions
are highly worried about CC[3]; believe CC is a top issue for young voters[8]; increasing fuel efficiency is critical to fighting CC[9]; CC is a threat to way of life[14]; there is a scientific consensus on CC[20]	support the GND[1,3]
the GND will create millions of jobs[1,27]; climate change is an emergency and existential threat[2,19]; combating CC requires massive federal mobilisation[2]; CC is a geopolitical threat[5]; a middle ground will not be enough [12,17,19]; Republicans have no solutions for the climate crisis[18]; urgent action within 10-12 years is necessary[19,27]; avoiding economic damages by climate change[27]; fossil fuel industries profit from destroying the planet[28]	support the Green New Deal[1,17]; oppose 'middle ground' on CC[3]; want to decarbonise by 2030 or 2050[3,4]; job creation[4,5,27]; modernise infrastructure[4]; promote renewables[4,27]; increase research budget[5]; overhaul agriculture[5]; focus singularly on CC[6]; decarbonise over the next decade[17,27]
Climate change is a crisis[17]; Fossil fuels will remain part of the energy portfolio[17]; the science shows that emissions need to be avoided[17]	a price on carbon[1,5]; net-zero emissions by 2050[1]; opposition to GND[1]; opposition to job guarantees[1]; fuel efficiency standards[12] boost renewable energies[12]; opposed Obama-era fracking regulations[17]; rejoin the Paris agreement[17,19]
more action on CC is needed[2]; there is a window of 11 years to preserve civilisation as we know it[17]; the administration's proposals are a death sentence for the young[17]	oppose a 'middle ground' on CC[3]; supports the GND[4]
Obama-era Clean Power Plan strangles the coal industry[24]; think the Green New Deal will ban cows and incite Genocide against white men[27]	support a bipartisan carbon price and dividend plan[16]
CC is not a threat to national security[11]; climate change is a hoax[11a]; thinks climate change is disputed by scientists[11a]; the US is a leader in GHG reductions[12,20,24]; the climate is changing because of humans[20,21]; there is no law to combat CC[21]; natural gas is a clean energy source[23]; renewable energy is insufficient to be reliable[24]; fossil fuels help in the transition to clean energy[25]; the Paris Agreement is unfair and ineffective[25]	roll back fuel efficiency standards[9]; energy dominance based on fossil fuels[21]; eliminate or delay environmental regulations[22,24,25,28]; replace Obama-era power plant rules[22,24]; oppose the Green New Deal[24,25]; infrastructure projects don't need to account for CC[25]; oppose the Paris Agreement[25]
there are about 11 years left to transform the economy[17,19]; the generation's survival is at stake[17]	support a Green New Deal[17]

Table 3B.4:

Portrayals by Bild

Outlet	Labels	Behaviours
The political left	**SPD** Carsten Träger[1], European Social Democrats[2,4], (Timmermans)[27]; Svenja Schulze[5,9]	warn of environmental collapse[4]; proposes climate protection law[9];
	Green party Lisa Badum[1]; Habeck[8], Charlotte Roche[11]	attack social democrats and conservatives for being behind on climate change[2]; criticise meat-eaters[11];
The political right	**CDU** European Conservatives[2,24,26]; Kretschmer[6]; Merkel[6a]	attack social democrats for being too radical[2]; attack Greens for blocking energy infrastructure improvement[3]; criticise CSU for hypocrisy[6];
	CSU Anja Weisgerber[1]; Manfred Weber[2,4,27]; Andreas Scheuer[3B]; Markus Söder[6,8]	attack social democrats for promoting prohibitions[2];
	FDP	criticise Greens for stoking fear and flight shame[7]; attack Greens for taking away people's meat and cars[11];
Young people	**Fridays for Future** international youth protesters[20]; Louisa Neubauer[23]; Greta Thunberg[27,30]	make climate change a European issue[21]; protest in brussels and sleep on the street[20]; peaceful protest[22,23]; criticise governments for delaying decisions[22]; participate in local government[22]; personal sacrifice[23]; travels by boat to climate conferences[27]; skips school to protest[30];
	German youth school students[9], youtubers[10];	are on strike[9]; delegitimise any opposition[10]; oppose flying for vacations[12]; accuse their parents for threatening their future[12]; vote predominantly Green[21]; skip school[23]; spend their free time to protest[23]; visit climate exhibitions[28]; take to the streets[29];

Objects of Knowledge	Policy Positions
climate policy needs to take social issues into account[4]; german car industry has missed its opportunity[4]; European people's party stands in the way[4]; CC was a decisive issue in the European election[21]	a price on carbon emissions[1]; prohibit short-distance flights[2,27]; EU-wide climate neutrality by 2050[4]; offer a carbon dividend to citizens[19]; promote trains[2,24]; make flying more expensive[5,27]; declare climate emergency in cologne[31];
by 2038 train travel will have replaced inner-German flights[1]; climate change is causing European heatwaves[37];	phase out inner-German flights by 2038[1]; promote train travel[1]; kerosene tax[2,3]; promote public transport[3]; prohibit flights[5]; reduce taxes on train travel[8]; prohibit industrial meat production and plastics[11]; want Europe to focus on climate protection[21]; declare climate emergency in cologne[31];
train travel is at a disadvantage due to having to buy emission certificates for electricity[2]; German measures are meaningless if the US and China don't follow[3]; climate change above 1.5 C would be disastrous[6a]; a carbon price will phase out coal automatically[6];	carbon price, no prohibitions[2]; phase out flights, promote trains[2,24]; German climate neutrality until 2050[6]; wants Europe to be climate neutral[26];
trains must become more competitive[2]; acting too rapidly would worsen inequality[4]; a rapid coal exit is needed to reach emissions targets[6];	against prohibitions but incentives[1,2]; reduce taxes on train travel[1,2,8]; promote train travel to replace flights[2,27]; emissions trading[2]; speed up the exit from coal[6]; support R&D instead of coal regions[6]; subsidise a transition to renewable energy[8]; climate protection should be part of german "Grundgesetz"[8];
prohibitions won't save the climate but make people angry[2]; prohibitions make things more expensive and create unfreedom[2]; prohibitions will lead to Germany losing its competitive edge[7]; only global solutions will suffice[11];	climate protection without prohibitions[7]; promote market based solutions and technological innovations[7];
political parties ignore climate change[12]; climate change is an existential threat[22,23]; transition to renewables by 2035 is possible[23]; human rights[23]; a small group of people is responsible for most emissions[23]; capitalism needs to change[23]; avoid emissions at all cost[27];	stop exploiting fossil fuels[23]; carbon neutrality by 2035[23]; against nuclear energy[23];
concerned that grownups destroy the planet[9]; immediate radical action is necessary[10]; strawberries and flying have big ecological impacts[12];	

Table 3B.5:

Portrayals by Die Welt

Outlet	Labels	Behaviours
The political left	**SPD** Svenja Schulze[3]; Dohnanyi[6];	present scientific evidence for carbon price[4], accuse Greens of not making concrete proposals and avoiding real conflict[6]; debate consequences of the lest European election[8]; support youth protests[28];
	Greens Habeck[4,6];	criticise CDU for prioritising campaigning over climate protection[2]; accuse government of inaction[6]; claim to represent Fridays for future in the European parliament[7]; celebrate surprising victory in European election[8]; criticise CSU for populism and inaction[17];
The political Right	**CDU** Annegret Kramp-Karrenbauer[2]; Peter Altmaier[3,4,20]; Ole von Beust[7]; local CDU politicians[9]; liberal CDU members[11a]; Mohring[11]; Klöckner[13]; Merkwel[15,30]	criticise SPD for carbon tax initiative[3]; does not take protesting youth serious[7]; have made mistakes in the European election campaign[7]; don't have a response to young voters concerns[8]; declare climate emergency[9]; initiated and pass laws[31];
	CSU Scheuer[5]; Söder[17];	attacks Greens as hypocritical[5]; seek engagement with the Green party[8];
	FDP	
Young people	**German Youth** AfD youth[10]; Rezo[19a]	protest for climate protection[19]; attacks CDU/CSU for inaction on climate change[19a]; is politically active[20]; creates pressure on politics[30]; protest in the streets[33];
	Fridays for Future Louisa Neubauer[9];	protest[9,28,30;16,19]; school strike[9]; give interviews[9,20]; demand a climate emergency[9]; attack RWE for inaction[9]; are not impressed by CDU proposals[11]; demand more action from politicians[16]; attack CDU for inaction[16]; demand concrete measures[17]; cooperate with scientists[19]; demand that people stop flying[32];

Objects of Knowledge	Policy Positions
carbon dividend will benefit low-income earners[1]; climate goals can't be ignored[2]; climate change is central issue of our time[6]; the federal government has not done too little[6]; individuals need to change their consumption behaviour[6]; transportation policy needs to do more[25]; no need for flight shame[25]; social compensation is needed for commuters[25,30]; too little climate protection so far[28]	carbon tax and dividend[1,2,3,]; reducing emissions abroad by financial support[6]; want to reduce urban-rural inequalities[8]; coal exit 2038[20]; compensate coal regions[20]; make rail travel a viable alternative[25]; carbon tax[28,30]; help
emissions trading will not have desired effects[2]; the CDU does not care about environment[2]; carbon taxes need not lead to unrest[4]; carbon dividend will benefit low-income earners[4]; the government has slowed down progress with the energy transition[6]; government plan for coal exit to slow[20];	carbon tax and dividend[2,4]; investments in rail infrastructure[5,18]; kerosene tax[5,18]; no prohibition, but making short distance travel obsolete[5]; more offshore wind parks[6]; promote bicycles and public transport[7]; reduce tax on train tickets[17];
new taxes will have to be payed by low-income earners[2]; more action on climate change is needed[3]; job-protection[3,31]; don't disadvantage rural areas[3]; no additional burden on economy[4]; no additional burden on citizens[4]; yellow west movement was triggered by climate taxes[4]; young people will have to live a longer time under climate change[5]; more policy action is needed[6]; The Green's success is not because of climate change[7]; the Greens are not supported in the East[8]; climate change is an emotional issue[7]; there is an East-West divide on climate policy[7]; forests are necessary for climate protection[13]; view economic advice as basis for policy making[15]; all sectors of the economy need to be involved[31]; economic transformation will bring new jobs[31]; emission reduction targets for 2030 should be reached[31];	expansion of emissions trading[1,2]; opposition to carbon tax[2,3,4,28]; sustainable emissions reduction[3]; want to reduce urban-rural inequalities[8]; significant carbon prices[11a]; carbon taxes at EU level[11a]; carbon tax cannot be ruled out[12]; reward environmentally friendly behaviour[12]; more money for forest protection[13,23]; market-based solutions[15]; coal exit 2038[20,31]; compensate coal regions[20]; wants coal and nuclear phase-out[30]; promote renewable energy[31];
street tolls can have a steering effect[29]; car drivers need to pay for using streets, but need to be compensated for extra burdens[29]	expansion of emissions trading[1]; opposition to carbon tax[4]; investments into rail infrastructure[5]; reduce taxes on train tickets[17]; coal exit 2038; compensate coal regions[20]; street tolls[29];
economic growth not at odds with climate protection[24]; human right[24];	opposition to new taxes[4]; in favour of emissions trading schemes[4,24]; Europe should finance emissions reduction elsewhere[24];
climate change is most important issue in the next years[6]; the AfD needs to stop denying climate change[10]; German established politics does too little[33];	
there is a climate emergency[9,16]; science shows gravity of CC[9]; the government fails to act[9]; individual behaviour change won't suffice[9]; climate protection is not a polarising issue[16]; young people seek opportunities to make their voices heard[16]; question our understanding of wealth and the good life[20]; see climate protection as the most important political issue[28];	declaration of climate emergency[9]; meet already established (Paris Agreement) goals[9]; economic transformation[9]; coal exit by 2030[20]; carbon price[20];

Table 3B.6:

Portrayals by Süddeutsche Zeitung

Outlet	Labels	Behaviours
The political left	**SPD** Svenja Schulze[1,9];	present studies on carbon prices[1,9]; seek scientific arguments for their policies[9]
	Greens Bavarian greens[7]	demand less talk, more action in Bavaria[7];
The political Right	**CDU** Merkel[3,11]; Peter Altmeier[9];	praises renewable energy expansion in China[3]; do not understand that climate change is an existential question[5]; unable to formulate visions for the future[5]; task economic council with analysing carbon pricing options[9]; seek scientific arguments for their policies[9]
	CSU Markus Söder[7];	seek scientific arguments for their policies[9]
	FDP	—
Young people	**Young people** youtube influencers[5a]	vote predominantly for the Green party[5]; take to the streets [18]; skip school to protest [20];
	Fridays for Future movement Greta Thunberg[14];	call other people to join protests[12]; protest in the streets[5,12,13]; have radical demands[5]; sacrifice social and school time to protest[12]; attack RWE for being Europe's largest corporate emitter[13]; sails to America to avoid emissions[14];

References can be found in Appendix 3A

Objects of Knowledge	Policy Positions
carbon prices can be socially fair[1]; enough time has been wasted, measures need to be implement soon[1];	carbon tax and dividend[1]; low-income earners, commuters, and renters shouldn't carry the burden[1]; European emissions trading[2]; promote research[2]; increase energy storage capabilitiess[2]; a carbon price[8];
	effective carbon price[2]; use agriculture subsidies to promote sustainable practices[2]; require buildings to produce energy[2];
carbon emissions need to be reduced[3]; the big question is how to achieve carbon neutrality by 2050[3]; international collective efforts are needed[3]; industrial states carry responsibility[3]; global finance needs to promote sustainability[3]; international cooperation is needed to combat CC[11];	global carbon prices[2]; growth with low impact on resources[2]; climate neutrality by 2050 [3,11]; double the amount Germany provides for a climate adjustment fund[3]; a carbon price[8];
governance through incentives[6]; economy, ecology, social affairs can go hand in hand[6,7];	global carbon prices[2]; growth with low impact on resources[2]; opposed to carbon tax[6], in favour EU emissions trading[6]; climate neutrality in Bavaria by 2040[7];
the market and technological progress are key to protecting the climate[2]; our current lifestyle shouldn't have to change[4];	global emissions trading[2]; no national or European regulations beyond carbon prices[2];
official climate policy is too slow[5a]; see climate change as an existential threat[5];	want Germany to be climate neutral by 2035[5a];
inaction by politicians and grownups; politicians, industry and society have failed to act[12]; fossil fuel companies profit from destroying young people's futures[12]; politicians allowed private profit to destroy the climate[12]; young people can't stop the climate crisis alone[12]; the planet is burning[12]; emissions need to drop rapidly[12]	policies to limit warming to 1.5 degrees[12]; system change not climate change[15]; end of capitalism[15];

Block: Demographics

	Zunächst möchten wir Sie um einige Hintergrundinformationen bitten.	First, we would like to ask you for some background information.
ages	Was ist ihr Geburtsjahr (im Format JJJJ)?	What is your year of birth (in format YYYY)?
sex	Bitte geben Sie Ihr Geschlecht an. weiblich männlich divers/ nicht-binär Ich bevorzuge es, mein Geschlecht nicht anzugeben	Please enter your gender. female male divers/ non-binary I prefer not to indicate my gender
region	In welchem Bundesland sind Sie wohnhaft? Nordrhein-Westfalen Bayern Hessen Baden-Württemberg Niedersachsen Sachsen Rheinland-Pfalz Mecklenburg-Vorpommern Saarland Schleswig-Holstein Thüringen Sachsen-Anhalt Brandenburg Bremen Berlin Hamburg Zur Zeit nicht in Deutschland wohnhaft	In which federal state do you live? Nordrhein-Westfalen Bayern Hessen Baden-Württemberg Niedersachsen Sachsen Rheinland-Pfalz Mecklenburg-Vorpommern Saarland Schleswig-Holstein Thüringen Sachsen-Anhalt Brandenburg Bremen Berlin Hamburg Currently not living in Germany
income	Wie hoch ist Ihr geschätztes monatliches Haushaltseinkommen? Darzulegen ist die Summe, die sich aus Lohn, Gehalt, Einkommen aus selbständiger Tätigkeit, Rente oder Pension jeweils nach Abzug der Steuern und Sozialversicherungsbeiträge ergibt. Rechnen Sie bitte auch die Einkünfte aus öffentlichen Beihilfen, Einkommen aus Vermietung, Verpachtung, Wohngeld, Kindergeld und sonstige Einkünfte hinzu. Keine Angabe Bis zu unter 500 Euro 500 bis unter 900 Euro 900 bis unter 1.300 Euro 1.300 bis unter 2.000 Euro 2.000 bis unter 2.600 Euro 2.600 bis 3.200 Euro 3.200 Euro und mehr Kein Einkommen	What is your estimated monthly household income? This is the sum of wages, salary, income from self-employment, pension or retirement, after deduction of tax and social security contributions. Please also include income from public assistance, income from renting, leasing, housing benefit, child benefit and other income. Not specified Up to under 500 euros 500 to under 900 euros 900 to under 1,300 euros 1,300 to under 1,500 euros 1,500 to under 2,000 euros 2,000 to under 2,600 euros 2,600 to under 3,200 euros 3,200 euros and more No income

Block: Education

edu_intro	Bitte geben Sie uns einige Informationen zu Ihrer Schul- und Ausbildung.	Please give us some information about your schooling and education.
edu_sc	Bitte geben Sie Ihren höchsten allgemeinen Schulabschluss an. (noch) kein Schulabschluss (1) Schulabschluss ohne Studienberechtigung (3) Schulabschluss mit Studienberichtigung (Fachhochschulreife, Abitur, etc) (11) Anderer Abschluss (8)	Please indicate your highest general school leaving certificate. - No school leaving certificate (yet) (1) - School leaving certificate without university entrance qualification (3) - School-leaving certificate with study correction (entrance qualification for studies at universities of applied sciences, Abitur, etc) (11) - Other degree (8)
Edu_st	Bitte geben Sie Ihren höchsten beruflichen Ausbildungs- oder Hochchulabschluss an (falls beides zutrifft, wählen sie Studienabschluss). (Noch) kein Abschluss (1) Abgeschlossene Lehre, Berufsfachschule, Kolleg, o.ä. (2) Meister-/Techniker-/gleichwertiger Fachschulabschluss (3) Bachelor einer Fachhochschule oder Universität (4) Diplom einer Fachhochschule oder Universität (5) Master einer Fachhochschule oder Universität (6) Promotion oder Habilitation (10) Anderer Abschluss (11)	Please enter your highest vocational training or university degree (if both apply, please select degree). no degree (yet) (1) Completed apprenticeship, vocational school, college, etc. (2) Master/craftsman/technician/equivalent vocational school qualification (3) Bachelor's degree from a university of a "Fachschule" or university (4) Diploma from a university of applied sciences or university (5) Master's degree from a university of applied sciences or university (6) Doctorate or Habilitation (10) Other degree (11)

Block: Political preferences

	Nun möchten wir Sie um einige Informationen zu Ihren politischen Präferenzen bitten.	Now we would like to ask you for some information on your political preferences.
Pol_ parties	Bitte ordnen Sie die im Bundestag vertretenen politischen Parteien entsprechend Ihrer Präferenzen. Dazu weisen Sie bitte den unten aufgelisteten Parteien im Bundestag eine Zahl zwischen 1 und 7 zu. Weisen Sie bitte der Partei, die Sie am ehesten bei der nächsten Bundestagswahl wählen würden eine 1 zu, und der Partei, die Sie am ehesten nicht bei der nächsten Bundestagswahl wählen würden eine 7. Bitte weisen Sie dementsprechend auch den restlichen Parteien eine Zahl zu. Jede Zahl kann nur einmal vergeben werden. _____ CDU (1) _____ CSU (2) _____ SPD (3) _____ Die Linke (4) _____ Bündnis 90/ Die Grünen (5) _____ FDP (6) _____ AfD (7)	Please rank the political parties represented in the Bundestag according to your preferences. To do so, please assign a number between 1 and 7 to the political parties in the Bundestag listed below. Please assign a 1 to the party you are most likely to vote for in the next Bundestag elections and a 7 to the party you are most likely not to vote for in the next Bundestag elections. Please also assign a number to the other parties accordingly. Each number can only be assigned once. _____ CDU (1) _____ CSU (2) _____ SPD (3) _____ Die Linke (4) _____ Bündnis 90/ Die Grünen (5) _____ FDP (6) _____ AfD (7)
Pol_scale	In politischen Angelegenheiten spricht man oft von “Links” und “Rechts”. Wie würden Sie Ihre Ansichten auf dieser Skala einordnen, wenn 0 für links steht und 10 für rechts? links (1) 1 (14) 2 (2) 3 (3) 4 (4) 5 (5) 6 (6) 7 (7) 8 (10) 9 (11) rechts (12)	In political affairs one often speaks of “left” and “right”. How would you classify your views on this scale if 0 stood for left and 10 for right? left (1) 1 (14) 2 (2) 3 (3) 4 (4) 5 (5) 6 (6) 7 (7) 8 (10) 9 (11) right (12)

Block: Stimulus

control_intro	Im Laufe des letzten Jahres wurde in den Medien häufig über das Thema Klimawandel berichtet. Im Rest dieser Umfrage sind wir an Ihrer Meinung und Auffassungen zum diesem Thema und der medialen Berichterstattung darüber interessiert, und werden Ihnen diesbezüglich einige Fragen stellen.	Over the past year, the media has reported frequently on the subject of climate change. For the remainder of this survey, we are interested in your opinions and views on this issue and the media coverage of it, and we will ask you some questions about it.
simple_ consensus	Im Laufe des letzten Jahres wurde in den Medien häufig über das Thema Klimawandel berichtet. So war zum Beispiel vermehrt zu lesen, dass "97 % der Klimawissenschaftler und -wissenschaftlerinnen zustimmen, dass der menschengemachte Klimawandel stattfindet". Im Rest dieser Umfrage sind wir an Ihrer Meinung und Auffassungen zum diesem Thema und der medialen Berichterstattung darüber interessiert, und werden Ihnen diesbezüglich einige Fragen stellen.	Over the past year, the media has reported frequently on the subject of climate change. For example, there has been an increasing number of reports that "97% of climate scientists agree that man-made climate change is taking place". For the remainder of this survey, we are interested in your opinions and views on this topic and the media coverage of it, and we will ask you some questions about it.
conditions	Im Laufe des letzten Jahres wurde in den Medien häufig über das Thema Klimawandel berichtet. So wurde zum Beispiel ${e://Field/display_politician} wie folgt zitiert: "${e://Field/display_policy}" Im Rest dieser Umfrage sind wir an Ihrer Meinung und Auffassungen zum diesem Thema und der medialen Berichterstattung darüber interessiert, und werden Ihnen diesbezüglich einige Fragen stellen.	Over the past year, the media has reported frequently on the subject of climate change. For example, ${e://Field/display_politician} was quoted as follows: "${e://Field/display_policy}". For the rest of this survey we are interested in your opinion and views on this topic and the media coverage of it, and we will ask you some questions about it.

Stimulus material

Party	Politician
CDU	Joachim Pfeiffer, CDU-Bundestagsabgeordneter mit Fachbereich Energiepolitik
SPD	Bernd Westphal, SPD-Bundestagsabgeordneter mit Fachbereich Energiepolitik
Bündnis 90/ Die Grünen	Julia Verlinden, Bundestagsabgeordnete der Grünen mit Fachbereich Energiepolitik
Die Linke	Lorenz Gösta Beutin, Bundestagsabgeordneter der Linken mit Fachbereich Energiepolitik
Alternative fü Deutschland (AfD)	Steffen Kotrė, AFD-Bundestagsabgeordneter mit Fachbereich Energiepolitik
FDP	Martin Neumann, FDP-Bundestagsabgeordneter mit Fachbereich Energiepolitik

Text	Translation
97% der WissenschaftlerInnen sind sich einig, dass der menschengemachte Klimawandel stattfindet. Wir müssen dringend handeln, und das heißt für uns eine konsequente Umsetzung des Zertifikatehandels für CO2-Emissionen in der Energiewirtschaft.	97% of scientists agree that man-made climate change is taking place. We need to act urgently, and for us this means consistent implementation of certificate trading for CO2 emissions in the energy industry.
97% der WissenschaftlerInnen sind sich einig, dass der menschengemachte Klimawandel stattfindet. Wir müssen dringend handeln, und das heißt für uns, durch staatliche Unterstützung den Ausstieg aus den fossilen Energieträgern arbeitsplatzfreundlich voranzutreiben.	97% of scientists agree that man-made climate change is taking place. We must act urgently, and for us this means using government support to promote the phase-out of fossil fuels in a job-friendly way.
97% der WissenschaftlerInnen sind sich einig, dass der menschengemachte Klimawandel stattfindet. Wir müssen dringend handeln, und das heißt für uns vor allem, den Ausstieg aus fossilen Energieträgern gesetzlich festzuschreiben.	97% of scientists agree that man-made climate change is taking place. We must act urgently, and for us this means above all making the phase-out of fossil fuels a legal requirement.
97% der WissenschaftlerInnen sind sich einig, dass der menschengemachte Klimawandel stattfindet. Wir müssen dringend handeln, und das heißt für uns, die großen Energiekonzerne zu entmachten und die Beteiligung der Bürgerinnen und Bürger an der Energieversorgung zu fördern.	97% of scientists agree that man-made climate change is taking place. We need to act urgently, and for us this means disempowering the big energy companies and promoting citizens' participation in energy supply.
97% der WissenschaftlerInnen sind sich einig, dass der menschengemachte Klimawandel stattfindet. Wir müssen dringend handeln – das heißt für uns allerdings, dass wir auf die Nutzung moderner Gas- und Kohlekraftwerke auf absehbare Zeit nicht verzichten können.	97% of scientists agree that man-made climate change is taking place. We must act urgently - but for us this means that we cannot do without modern gas and coal-fired power stations for the foreseeable future.
97% der WissenschaftlerInnen sind sich einig, dass der menschengemachte Klimawandel stattfindet. Wir müssen dringend handeln, und das heißt für uns, den Wandel im Energiesektor mit einem globalen Zertifikatehandel für CO2-Emissionen voranzutreiben.	97% of scientists agree that man-made climate change is taking place. We must act urgently, and for us this means driving forward change in the energy sector with global trading in CO2 emissions certificates.

Block: Open response

	Falls Sie möchten, können Sie uns einleitend Ihre Gedanken zum Thema Klimawandel und der Berichterstattung darüber mitteilen (optional).	If you wish, you can start by sharing your thoughts on climate change and reporting on it (optional).

Block: Perceived scientific agreement

Q79	Zunächst möchten wir wissen, wie sie die Meinungslage unter Wissenschaftlerinnen und Wissenschaftlern einschätzen. In den folgenden Fragen bitten wir Sie um Schätzung eines Prozentwerts. Bitte ziehen Sie dafür den Schieberegler auf die entsprechende Position. Die Position ganz links entspricht 0 % (niemand), die Position ganz rechts 100 % (alle).	First of all, we would like to know how they assess the opinion situation among scientists. In the following questions we ask you to estimate a percentage. Please drag the slider to the corresponding position. The leftmost position corresponds to 0% (nobody), the rightmost position to 100% (all).
Psa_real	Wie viel Prozent der Klimawissenschaftler und Klimawissenschaftlerinnen sind nach Ihrem besten Wissen der Überzeugung, dass der menschengemachte Klimawandel stattfindet? [Die Befragten werden gebeten, einen Schieberegler innerhalb eines Bereichs von 0 bis 100 zu bewegen, wobei 0 für 0% wahrgenommene wissenschaftliche Übereinstimmung und 100 für 100% wahrgenommene wissenschaftliche Übereinstimmung steht]	What percentage of climate scientists believe to the best of their knowledge that man-made climate change is taking place? [Respondents are asked to move a slider within a range of 0 to 100, with 0 indicating 0% perceived scientific agreement and 100 indicating 100% perceived scientific agreement]
Psa_ cons	Wie viel Prozent der Klimawissenschaftler und Klimawissenschaftlerinnen sind nach Ihrem besten Wissen der Überzeugung, dass der Klimawandel gravierende Konsequenzen für Umwelt, Mensch und Wirtschaft hat? [Die Befragten werden gebeten, einen Schieberegler innerhalb eines Bereichs von 0 bis 100 zu bewegen, wobei 0 für 0% wahrgenommene wissenschaftliche Übereinstimmung und 100 für 100% wahrgenommene wissenschaftliche Übereinstimmung steht]	What percentage of climate scientists believe, to the best of their knowledge, that climate change has serious consequences for the environment, people and the economy? [Respondents are asked to move a slider within a range of 0 to 100, with 0 indicating 0% perceived scientific agreement and 100 indicating 100% perceived scientific agreement]
Psa_ action	Wie viel Prozent der Klimawissenschaftler und Klimawissenschaftlerinnen sind nach Ihrem besten Wissen der Überzeugung, dass Fortschritte im Klimaschutz dringend notwendig sind? [Die Befragten werden gebeten, einen Schieberegler innerhalb eines Bereichs von 0 bis 100 zu bewegen, wobei 0 für 0% wahrgenommene wissenschaftliche Übereinstimmung und 100 für 100% wahrgenommene wissenschaftliche Übereinstimmung steht].	What percentage of climate scientists believe, to the best of their knowledge, that progress in climate protection is urgently needed? [Respondents are asked to move a slider within a range of 0 to 100, with 0 indicating 0% perceived scientific agreement and 100 indicating 100% perceived scientific agreement]

Block: Perceived political agreement

Ppa_ intro	Als nächstes geht es um die Meinungslage unter Politikerinnen und Politikern. Wie oben bitten wir Sie in der folgenden Frage um Schätzung eines Prozentwerts. Bitte ziehen Sie dafür den Schieberegler auf die entsprechende Position. Die Position ganz links entspricht 0 % (niemand), die Position ganz rechts 100 % (alle).	Next, we will look at the opinions among politicians. As above, we ask you to estimate a percentage in the following question. Please drag the slider to the appropriate position. The leftmost position corresponds to 0% (nobody), the rightmost position to 100% (all).
Ppa_ real	Wie viel Prozent der Politiker und Politikerinnen der Parteien, die im Bundestag vertreten sind, sind nach Ihrem besten Wissen der Überzeugung, dass der menschengemachte Klimawandel stattfindet? [Die Befragten werden gebeten, einen Schieberegler innerhalb eines Bereichs von 0 bis 100 zu bewegen, wobei 0 für 0% wahrgenommene politische Zustimmung und 100 für 100% wahrgenommene politische Zustimmung steht]	To the best of your knowledge, what percentage of politicians from the parties represented in the Bundestag are convinced that man-made climate change is taking place? [Respondents are asked to move a slider within a range of 0 to 100, with 0 indicating 0% perceived political agreement and 100 indicating 100% perceived political agreement]
Ppa_ cons	Wie viel Prozent der Politiker und Politikerinnen der Parteien, die im Bundestag vertreten sind, sind nach Ihrem besten Wissen der Überzeugung, dass der Klimawandel gravierende Konsequenzen für Umwelt, Mensch und Wirtschaft hat? [as above]	To the best of your knowledge, what percentage of politicians from the parties represented in the Bundestag are convinced that climate change has serious consequences for the environment, people and the economy? [as above]
Ppa_ action	Wie viel Prozent der Politiker und Politikerinnen der Parteien, die im Bundestag vertreten sind, sind nach Ihrem besten Wissen der Überzeugung, dass Fortschritte im Klimaschutz dringend notwendig sind? [Die Befragten werden gebeten, einen Schieberegler innerhalb eines Bereichs von 0 bis 100 zu bewegen, wobei 0 für 0% wahrgenommene politische Zustimmung und 100 für 100% wahrgenommene politische Zustimmung steht]	To the best of your knowledge, what percentage of politicians from the parties represented in the Bundestag are convinced that progress in climate protection is urgently needed? [Respondents are asked to move a slider within a range of 0 to 100, with 0 indicating 0% perceived political agreement and 100 indicating 100% perceived political agreement]

Block: Climate science beliefs

	Nun wenden wir uns Ihren persönlichen Meinungen und Auffassungen zu.	Now we turn to your personal opinions and views.
Csb_real	Zu welchem Grad glauben Sie daran, dass der Klimawandel stattfindet?	To what extent do you believe that climate change is happening?
	Ich glaube überhaupt nicht, dass der Klimawandel stattfindet	I do not believe that climate change is happening at all
	Ich bin mir unsicher, ob der Klimawandel stattfindet oder nicht	I am unsure whether climate change is happening or not
	Ich glaube fest daran, dass der Klimawandel stattfindet	I firmly believe that climate change is happening
Csb_human	Zu welchem Grad glauben Sie, dass der Klimawandel hauptsächlich durch menschliche Aktivitäten verursacht wird?	To what extent do you believe that climate change is mainly caused by human activities?
	Ich glaube überhaupt nicht, dass der Klimawandel hauptsächlich durch menschliche Aktivitäten verursacht wird (1)	I do not believe at all that climate change is mainly caused by human activities (1)
	Ich bin mir unsicher, ob der Klimawandel hauptsächlich durch menschliche Aktivitäten verursacht wird (4)	I am uncertain whether climate change is mainly caused by human activities (4)
	Ich glaube, dass der Klimawandel hauptsächlich durch menschliche Aktivitäten verursacht wird (7)	I believe that climate change is mainly caused by human activities (7)
Csb_cons	Wie gravierend sind Ihrer Meinung nach die Konsequenzen des Klimawandels auf Umwelt, Mensch und Wirtschaft?	In your opinion, how serious are the consequences of climate change for the environment, people and the economy?
	Ich glaube überhaupt nicht, dass die Konsequenzen gravierend sind (1)	I do not believe that the consequences are serious at all (1)
	Ich bin mir unsicher darüber, ob die Konsequenzen gravierend sind (4)	I am unsure whether the consequences are serious (4)
	Ich glaube fest daran, dass die Konsequenzen gravierend sind (7)	I firmly believe that the consequences are serious (7)
Csb_action	Für wie dringend notwendig halten Sie Fortschritte im Klimaschutz um den Klimawandel zu mildern?	How urgently do you consider progress in climate protection to be necessary to mitigate climate change?
	Ich denke, dass Maßnahmen bezüglich des Klimaschutzes überhaupt nicht dringend notwendig sind (1)	- I don't think that climate protection measures are urgently needed at all (1)
	Ich bin mir unsicher, ob Fortschritte im Klimaschutz dringend notwendig sind (4)	- 2 (2) - 3 (3) - I am unsure whether progress on climate change is urgently needed (4)
	Ich denke, dass Maßnahmen bezüglich des Klimaschutzes sehr dringend notwendig sind (7)	- (5) - (6) - I believe that action on climate change is very urgent (7)

Block: Climate change efficacy beliefs

eff_pers	Inwieweit stimmen Sie den folgenden Aussagen zu? Überhaupt nicht ... (7) sehr stark Ich fühle mich fähig, durch meine Handlungen den Klimawandel zu mildern (1) Durch Änderung meines Lebensstils kann ich dazu beitragen, den Klimawandel zu mildern (2) Mein persönliches Handeln kann zum Klimaschutz beitragen (3)	To what extent do you agree with the following statements? (1) Not at all ... (7) very strongly - I feel capable of mitigating climate change through my actions (1) - By changing my lifestyle I can help to mitigate climate change (2) - My personal actions can contribute to climate protection (3)
eff_coll	Inwieweit stimmen Sie den folgenden Aussagen zu? Überhaupt nicht ... (7) sehr stark Jeder ist dazu in der Lage, das eigene Verhalten zu ändern, um zu einer Milderung des Klimawandels beizutragen (1) Gemeinsam können wir zu einer Milderung des Klimawandels beitragen (2) Durch gemeinsame Bemühungen, können wir den Klimaschutz vorantreiben (3)	To what extent do you agree with the following statements? (1) Not at all ... (7) very strongly - Everyone has the capacity to change their own behaviour in order to contribute to climate change mitigation (1) - Together we can help mitigate climate change (2) - Through joint efforts, we can drive forward climate ptotection (3)
eff_pol	Inwieweit stimmen Sie den folgenden Aussagen zu: Überhaupt nicht ... (7) sehr stark Ich habe die Möglichkeit, politische Entscheidungen zum Thema Klimawandel zu beeinflussen (1) Die praktische Umsetzung von politischen Entscheidungen kann zum Klimaschutz beitragen (2) Der Klimawandel kann durch politische Maßnahmen gemildert werden (3)	To what extent do you agree with the following statements: (1) Not at all ... (7) very strongly - I have the opportunity to influence political decisions on climate change (1) - The practical implementation of political decisions can contribute to climate protection (2) - Climate change can be mitigated by political measures (3)

Block: Emotions

cc_worry_b	Wenn Sie an den Klimawandel denken, zu welchem Grad sind Sie besorgt? Überhaupt nicht ...(7) sehr stark Ich bin besorgt	When you think about climate change, to what extent are you worried? (1) Not at all ...(7) very strong - I am worried
Cc_anger_b	Wenn Sie an den Klimawandel denken, zu welchem Grad sind Sie wütend? Überhaupt nicht ...(7) sehr stark Ich bin wütend	When you think about climate change, to what extent are you angry? (1) Not at all ...(7) very strong - I am angry
Cc_hope_b	Wenn Sie an den Klimawandel denken, zu welchem Grad sind Sie hoffnungsvoll? Überhaupt nicht ...(7) sehr stark Ich bin hoffnungsvoll (gestimmt)	When you think about climate change, to what extent are you hopeful? (1) Not at all ...(7) very strong - I am hopeful
Cc_ emotion_b	Können Sie erläutern, weshalb Sie die von Ihnen genannten Emotionen empfinden (optional)?	Can you explain why you feel the emotions you mention (optional)?

Block: Original outcome measure

Cc_action	Denken Sie, dass die Menschen viel mehr oder viel weniger tun sollten um den Klimawandel zu mildern? Viel weniger (1) (2) (3) Soviel wie bisher (4) (5) (6) Viel mehr (7)	Do you think that people should do much more or much less to mitigate climate change? - Much less (1) - (2) - (3) - As much as before (4) - (5) - (6) - Much more (7)

Block: Intended behavior change

Be_int	Bitte geben Sie auf einer Skala von 1 bis 7 an, wie wahrscheinlich oder unwahrscheinlich es ist, dass Sie in den nächsten sechs Monaten persönlich wie folgt verhalten werden. Sehr unwahrscheinlich ... (7) sehr wahrscheinlich Ich werde klimafreundliches Verhalten in meinen Alltag integrieren (1) Ich werde klimafreundliche Transportmittel wählen (z.B. Fahrrad, Bahn, Elektroauto) (2) Ich werde auf Flugreisen verzichten (3) Ich werde bei meinen alltäglichen Konsumentscheidungen auf Klimafreundlichkeit achten (4) Ich werde mich öffentlich für weniger Klimaschutz einsetzen (5)	Please indicate on a scale of 1 to 7 how likely or unlikely it is that you will personally behave as follows in the next six months (1) Very unlikely ... (7) very likely - I will integrate climate-friendly behaviour into my everyday life (1) - I will choose climate-friendly means of transport (e.g. bicycle, train, electric car) (2) - I will not travel by air (3) - I will take climate friendliness into account in my everyday consumption decisions (4) - I will publicly advocate for less climate change protection (5)

Block: Policy support

ps_pro	Im Folgenden werden Ihnen verschiedene politische Maßnahmen im Bezug auf die Eindämmung des Klimawandels durch Verbote gezeigt. Wie sehr unterstützen oder lehnen Sie diese politischen Maßnahmen ab? Starke Ablehnung – (4) weder noch – (7) starke Zustimmung Verbot des Fahrens von Autos und Lastwagen, deren Kraftstoffverbrauch einen bestimmten Höchstwert überschreitet (1) Verbote des Verkauf von Haushaltgeräten, die die Anforderungen an die Klimafreundlichkeit nicht erfüllen (2) Verbot des Einsatzes von Gerätschaften in der Industrie, die Richtwerte an Energieeffiziez und maximale Emissionswerte überschreiten (3)	Below are various policy measures to mitigate climate change through bans. How strongly do you support or oppose these policies? (1) Strong opposition - (4) neither - nor - (7) strong support - ban on driving cars and lorries whose fuel consumption exceeds a certain limit (1) - bans on the sale of household appliances that do not meet the climate-friendliness requirements (2) - a ban on the use in industry of equipment which exceeds guide values for energy efficiency and maximum emission levels (3)
ps_tax	Im Folgenden werden Ihnen verschiedene politische Maßnahmen im Bezug auf die Eindämmung des Klimawandels durch Emissionsbepreisungen (z.b. CO_2-Steuer oder Zertifikatehandel) gezeigt. Wie sehr unterstützen oder lehnen Sie diese politischen Maßnahmen ab? Starke Ablehnung – (4) weder noch – (7) starke Zustimmung Erhöhung des Preises auf fossile Kraftstoffe (1) Erhöhte Bepreisung von CO_2-Emissionen durch (privaten) Energie-oder Stromverbrauch (2) Erhöhte Bepreisung industrieller Emissionen von Treibhausgasen (3)	In the following, you will be shown various political measures relating to the mitigation of climate change through emissions pricing (e.g. CO_2 tax or certificate trading). How much do you support or oppose these policies? Strong opposition - (4) neither - nor - (7) strong support - increasing the price of fossil fuels (1) - Increased pricing of CO_2 emissions from (private) energy or electricity consumption (2) - Increased pricing of industrial emissions of greenhouse gases (3)
ps_sub	Im Folgenden werden Ihnen verschiedene politische Maßnahmen im Bezug auf die Eindämmung des Klimawandels durch staatliche finanzielle Unterstützung (Subventionen, Beihilfen, Förderungen) gezeigt. Wie sehr unterstützen oder lehnen Sie diese politischen Maßnahmen ab? Starke Ablehnung – (4) weder noch – (7) starke Zustimmung Unterstützung für den Ausbau des öffentlichen Verkehrsnetzes (1) Beihilfen für den privaten Einsatz erneuerbarer Energien (2) Förderungen für Maßnahmen in der Industrie, die zu einer Verringerung der CO_2-Emissionen führen (3)	Below you will find a number of policy measures relating to the mitigation of climate change through public financial support (subsidies, grants, grants). How much do you support or oppose these policies? (1) Strong opposition - (4) neither - nor - (7) strong support - Support for the development of the public transport network (1) - Aid for the private use of renewable energy (2) - support for measures in industry that lead to a reduction in CO_2 emissions (3)

APPENDIX 4B: OBSERVED VARIABLE DESCRIPTIVES

Table 4B.1

Means and standard deviations for variables by experimental condition

Latent construct	Observed variable	Experimental Condition			
		Control	Consensus	Ingroup	Outgroup
Perceived scientific agreement	psa_real	71.13 (21.345)	75.48 (20.929)	73.47 (22.469)	74.84 (22.693)
	psa_cons	75.88 (21.636)	78.27 (20.79)	76.79 (21.567)	77.93 (21.958)
	psa_action	77.25 (21.459)	80.88 (19.325)	79.33 (21.378)	80.37 (21.414)
Perceived political agreement	ppa_real	63.81 (19.209)	65.76 (19.776)	64.27 (19.792)	64.51 (19.386)
	ppa_cons	65.4 (18.787)	68.02 (19.696)	65.32 (19.455)	64.44 (20.11)
	ppa_action	64.78 (19.169)	68.49 (20.226)	66.56 (20.393)	65.27 (20.927)
Climate science beliefs	csb_real	5.81 (1.405)	5.87 (1.394)	5.72 (1.487)	5.86 (1.55)
	csb_human	5.44 (1.554)	5.6 (1.481)	5.38 (1.524)	5.39 (1.749)
	csb_cons	5.69 (1.36)	5.84 (1.345)	5.64 (1.538)	5.71 (1.521)
	csb_action	5.77 (1.45)	6 (1.334)	5.71 (1.574)	5.72 (1.627)
Personal efficacy	eff_pers_1	4.8 (1.582)	4.62 (1.616)	4.61 (1.709)	4.62 (1.744)
	eff_pers_2	5.07 (1.587)	4.92 (1.585)	4.92 (1.697)	4.89 (1.687)
	eff_pers_3	5.28 (1.496)	5.03 (1.603)	5.09 (1.641)	5.03 (1.63)
Collective efficacy	eff_coll_1	5.5 (1.442)	5.38 (1.539)	5.31 (1.584)	5.25 (1.664)
	eff_coll_2	5.55 (1.408)	5.39 (1.544)	5.4 (1.533)	5.31 (1.689)
	eff_coll_3	5.53 (1.455)	5.4 (1.541)	5.42 (1.545)	5.38 (1.635)
Political efficacy	eff_pol_1	4.08 (1.826)	3.92 (1.791)	4.11 (1.912)	4.01 (1.774)
	eff_pol_2	5.25 (1.473)	5.16 (1.622)	5.18 (1.61)	5.24 (1.685)
	eff_pol_3	5.13 (1.603)	5.12 (1.679)	5.19 (1.631)	5.11 (1.715)
—	cc_worry	5.15 (1.633)	5.16 (1.528)	5.04 (1.651)	5.11 (1.698)
—	cc_action	5.85 (1.238)	5.81 (1.35)	5.66 (1.379)	5.82 (1.483)

Behaviour change intentions	be_int_1	5.29 (1.602)	5.29 (1.485)	5.22 (1.537)	5.21 (1.566)
	be_int_2	4.66 (1.973)	4.73 (1.845)	4.75 (1.834)	4.6 (1.93)
	be_int_3	4.91 (2.093)	5.23 (1.996)	5.1 (2.038)	5.08 (2.027)
	be_int_4	5.18 (1.648)	5.18 (1.518)	5.03 (1.586)	5.07 (1.572)
Policy support (prohibition) (ps_pro)	ps_pro_1	4.79 (1.889)	4.73 (1.799)	4.58 (1.868)	4.67 (1.831)
	ps_pro_2	5.15 (1.774)	5.19 (1.672)	5.06 (1.696)	5.04 (1.759)
	ps_pro_3	5.28 (1.653)	5.36 (1.611)	5.19 (1.57)	5.23 (1.652)
Policy support (carbon price) (ps_tax)	ps_tax_1	4.36 (1.885)	4.27 (1.891)	4.14 (1.972)	4.29 (1.84)
	ps_tax_2	4.29 (1.89)	3.98 (1.911)	4.14 (1.86)	4.16 (1.872)
	ps_tax_3	5.06 (1.717)	5.08 (1.74)	4.83 (1.817)	5.02 (1.755)
Policy support (subsidy) (ps_sub)	ps_sub_1	5.48 (1.471)	5.59 (1.453)	5.58 (1.498)	5.42 (1.484)
	ps_sub_2	5.51 (1.455)	5.57 (1.392)	5.48 (1.471)	5.31 (1.546)
	ps_sub_3	5.57 (1.449)	5.53 (1.461)	5.43 (1.425)	5.24 (1.627)

Observed means and standard deviations. Variable descriptions and survey questions in Appendix 4A.

Table 4C.1

Direct and total effects of different treatment conditions (compared to control)

		Experimental Condition		
Dependent Variable		**Consensus**	**Ingroup**	**Outgroup**
Perceived scientific agreement	Direct	0.05 (-0.02,0.12)^{0}	0.03 (-0.05,0.11)^{0}	0.07 (0,0.14)^{0}
Perceived political agreement	Direct	-0.03 (-0.1,0.04)^{00}	0.02 (-0.06,0.1)^{00}	0.07 (0,0.14)^{0}
Climate science beliefs	Direct	-0.06 (-0.11,-0.01)^{0}	-0.04 (-0.1,0.01)^{00}	0.01 (-0.04,0.06)^{00}
	Total	-0.01 (-0.08,0.06)^{00}	-0.02 (-0.1,0.06)^{00}	0.06 (-0.01,0.13)^{0}
Personal efficacy	Direct	-0.09 (-0.15,-0.03)^{0}	-0.06 (-0.13,0.01)^{0}	-0.09 (-0.15,-0.02)^{0}
	Total	-0.06 (-0.13,0.01)^{0}	-0.05 (-0.13,0.03)^{0}	-0.05 (-0.12,0.02)^{0}
Collective efficacy	Direct	-0.11 (-0.16,-0.05)$^{-}$	-0.06 (-0.12,0)^{0}	-0.08 (-0.13,-0.02)^{0}
	Total	-0.07 (-0.14,0)^{0}	-0.04 (-0.12,0.04)^{0}	-0.03 (-0.1,0.04)^{0}
Political efficacy	Direct	-0.04 (-0.1,0.02)^{0}	-0.02 (-0.08,0.05)^{00}	-0.06 (-0.12,0)^{0}
	Total	-0.01 (-0.08,0.06)^{00}	0 (-0.08,0.08)^{00}	-0.01 (-0.08,0.06)^{00}
Worry about climate change	Direct	0.01 (-0.04,0.06)^{00}	-0.01 (-0.06,0.05)^{00}	-0.01 (-0.06,0.04)^{00}
	Total	-0.01 (-0.08,0.05)^{00}	-0.03 (-0.11,0.05)^{0}	0 (-0.06,0.07)^{00}
Behaviour change intentions	Direct	0.02 (-0.03,0.06)^{00}	0.01 (-0.04,0.07)^{00}	0.03 (-0.01,0.08)^{00}
	Total	-0.03 (-0.1,0.05)^{0}	-0.02 (-0.1,0.06)^{00}	0.02 (-0.05,0.09)^{00}
Policy Support	Direct	-0.03 (-0.08,0.02)^{00}	-0.01 (-0.07,0.04)^{00}	0.01 (-0.04,0.06)^{00}
	Total	-0.06 (-0.13,0.02)^{0}	-0.03 (-0.11,0.05)^{0}	0.01 (-0.06,0.08)^{00}

Standardised regression point estimates and Bayesian posterior highest density intervals at the .95 level. Following the definition provided in the methods section, $^{-}$ ($^{--}$), ^{0} (^{00}), $^{+}$ ($^{++}$), indicate (strong) evidence of a regression coefficient below 0, close to zero, and above 0, respectively

Table 4C.2:

Regressions from perceived scientific agreement and perceived political agreement on downstream variables

		Predictor Variable	
Dependent variable	**Effect**	**Perceived scientific agreement**	**Perceived political agreement**
Climate science beliefs	Direct	0.84 (0.8,0.88)$^{++}$	-0.13 (-0.19,-0.08)$^{-}$
Personal efficacy	Direct	0.54 (0.48,0.6)$^{++}$	-0.08 (-0.15,-0.01)^{0}
Collective efficacy	Direct	0.72 (0.67,0.77)$^{++}$	-0.12 (-0.18,-0.06)$^{-}$
Political efficacy	Direct	0.65 (0.6,0.71)$^{++}$	-0.06 (-0.12,0.01)^{0}
Worry about climate change	Direct	-0.03 (-0.11,0.06)^{0}	0.01 (-0.04,0.07)^{00}
	Total	0.59 (0.54,0.65)$^{++}$	-0.08 (-0.14,-0.01)^{0}
Behaviour change intentions	Direct	0 (-0.08,0.09)^{00}	-0.01 (-0.06,0.05)^{00}
	Total	0.42 (0.32,0.52)$^{++}$	-0.06 (-0.12,0)^{0}
Policy Support	Direct	-0.08 (-0.15,0)^{0}	-0.02 (-0.07,0.03)^{00}
	Total	0.41 (0.32,0.51)$^{++}$	-0.09 (-0.15,-0.02)^{0}

Standardised regression point estimates and Bayesian posterior highest density intervals at the .95 level. Following the definition provided in the methods section, $^{-}$ ($^{--}$), ^{0} (^{00}), $^{+}$ ($^{++}$), indicate (strong) evidence of a regression coefficient below 0, close to zero, and above 0, respectively

Table 4C.3

Regressions from climate science beliefs, efficacy beliefs and worry on worry, intended behaviour change and policy support

		Predictor Variable				
Dependent Variable		**Climate science beliefs**	**Personal efficacy**	**Collective efficacy**	**Political efficacy**	**Worry about climate change**
Worry about climate change	Direct	0.43 (0.34,0.51)$^{++}$	0.15 (0.07,0.24)$^{+}$	0.14 (0.03,0.26)$^{+}$	0.12 (0.04,0.2)$^{+}$	—
Intended behaviour change	Direct	0.22 (0.14,0.31)$^{++}$	0.35 (0.27,0.43)$^{++}$	0.21 (0.1,0.31)$^{+}$	0.05 (-0.03,0.12)^{0}	0.2 (0.15,0.26)$^{++}$
	Total	0.31 (0.23,0.39)$^{++}$	0.38 (0.3,0.46)$^{++}$	0.23 (0.12,0.34)$^{++}$	0.07 (-0.01,0.15)^{0}	—
Policy support	Direct	0.33 (0.24,0.43)$^{++}$	0.08 (0,0.17)^{0}	0.19 (0.07,0.3)$^{+}$	0.21 (0.13,0.3)$^{++}$	0.16 (0.11,0.22)$^{++}$
	Total	0.4 (0.32,0.49)$^{++}$	0.11 (0.02,0.2)$^{+}$	0.21 (0.09,0.33)$^{+}$	0.23 (0.15,0.31)$^{++}$	—

Standardised regression point estimates and Bayesian posterior highest density intervals at the .95 level. Following the definition provided in the methods section, $^{-}$ ($^{--}$), ^{0} (^{00}), $^{+}$ ($^{++}$), indicate (strong) evidence of a regression coefficient below 0, close to zero, and above 0, respectively

Table 4C.4:

Standardised factor loadings, intercepts, and residual variance

Latent construct	Observed variable	Loading	Intercept	Variance
Perceived scientific agreement	psa_real	0.86 (0.84,0.87)	-0.08 (-0.18,0.03)	0.27 (0.24,0.3)
	psa_cons	0.93 (0.92,0.94)	-0.09 (-0.19,0.03)	0.14 (0.11,0.16)
	psa_action	0.9 (0.88,0.91)	-0.08 (-0.19,0.03)	0.19 (0.17,0.22)
Perceived political agreement	ppa_real	0.87 (0.85,0.88)	-0.03 (-0.13,0.08)	0.25 (0.22,0.28)
	ppa_cons	0.93 (0.91,0.94)	-0.03 (-0.14,0.08)	0.13 (0.11,0.16)
	ppa_action	0.82 (0.8,0.84)	-0.03 (-0.13,0.07)	0.33 (0.29,0.36)
Climate science beliefs	csb_real	0.8 (0.78,0.82)	-0.02 (-0.11,0.08)	0.36 (0.32,0.39)
	csb_human	0.79 (0.76,0.81)	-0.02 (-0.11,0.08)	0.38 (0.35,0.42)
	csb_cons	0.88 (0.87,0.9)	-0.02 (-0.12,0.09)	0.22 (0.19,0.25)
	csb_action	0.91 (0.9,0.92)	-0.02 (-0.13,0.09)	0.17 (0.15,0.19)
Personal efficacy	eff_pers_1	0.87 (0.86,0.89)	0.08 (-0.02,0.19)	0.24 (0.21,0.27)
	eff_pers_2	0.92 (0.91,0.93)	0.09 (-0.02,0.2)	0.16 (0.14,0.18)
	eff_pers_3	0.91 (0.9,0.92)	0.09 (-0.02,0.2)	0.17 (0.15,0.2)
Collective efficacy	eff_coll_1	0.9 (0.89,0.91)	0.08 (-0.03,0.18)	0.19 (0.17,0.22)
	eff_coll_2	0.94 (0.93,0.95)	0.08 (-0.03,0.19)	0.11 (0.1,0.13)
	eff_coll_3	0.93 (0.92,0.94)	0.08 (-0.03,0.19)	0.14 (0.12,0.16)
Political efficacy	eff_pol_1	0.5 (0.46,0.54)	0.01 (-0.07,0.08)	0.75 (0.71,0.79)
	eff_pol_2	0.92 (0.91,0.94)	0.01 (-0.09,0.12)	0.14 (0.12,0.17)
	eff_pol_3	0.89 (0.87,0.91)	0.01 (-0.09,0.12)	0.21 (0.18,0.24)
Behaviour change intentions	be_int_1	0.91 (0.89,0.92)	0.02 (-0.08,0.11)	0.18 (0.15,0.2)
	be_int_2	0.58 (0.54,0.62)	0.01 (-0.07,0.09)	0.66 (0.62,0.71)
	be_int_3	0.47 (0.43,0.52)	0.01 (-0.06,0.08)	0.78 (0.73,0.82)
	be_int_4	0.89 (0.87,0.9)	0.02 (-0.08,0.11)	0.21 (0.18,0.24)
Policy support	ps_pro	0.91 (0.88,0.93)	0 (0,0)	0.18 (0.14,0.22)
	ps_tax	0.69 (0.65,0.73)	0 (0,0)	0.52 (0.46,0.57)
	ps_sub	0.88 (0.85,0.9)	0 (0,0)	0.23 (0.18,0.28)
Policy support (prohibition) (ps_pro)	ps_pro_1	0.77 (0.75,0.8)	0.03 (-0.06,0.12)	0.4 (0.37,0.44)
	ps_pro_2	0.87 (0.85,0.89)	0.04 (-0.06,0.13)	0.24 (0.21,0.28)
	ps_pro_3	0.84 (0.81,0.86)	0.03 (-0.06,0.12)	0.3 (0.27,0.34)
Policy support (taxes) (ps_tax)	ps_tax_1	0.89 (0.86,0.91)	0.03 (-0.05,0.11)	0.21 (0.18,0.25)
	ps_tax_2	0.82 (0.8,0.84)	0.03 (-0.05,0.1)	0.33 (0.29,0.37)
	ps_tax_3	0.74 (0.71,0.77)	0.02 (-0.05,0.1)	0.45 (0.4,0.49)
Policy support (subsidy) (ps_sub)	ps_sub_1	0.57 (0.53,0.61)	0.02 (-0.05,0.09)	0.67 (0.63,0.72)
	ps_sub_2	0.82 (0.79,0.84)	0.03 (-0.06,0.12)	0.33 (0.29,0.37)
	ps_sub_3	0.83 (0.81,0.86)	0.03 (-0.06,0.12)	0.31 (0.27,0.35)

Point estimates and Bayesian posterior highest density intervals at the .95 level

Table 4C.5

Standardised residual variances and covariances

	Perceived scientific agreement	Perceived political agreement	Climate science beliefs	
Perceived scientific agreement	0.99 (0.98,1)			
Perceived political agreement	0.59 (0.55,0.63)	0.99 (0.98,1)		
Climate science beliefs			0.41 (0.36,0.45)	
Personal efficacy			0.35 (0.29,0.41)	
Collective efficacy			0.44 (0.39,0.5)	
Political efficacy			0.41 (0.35,0.47)	
Behaviour change intentions				
Policy Support				

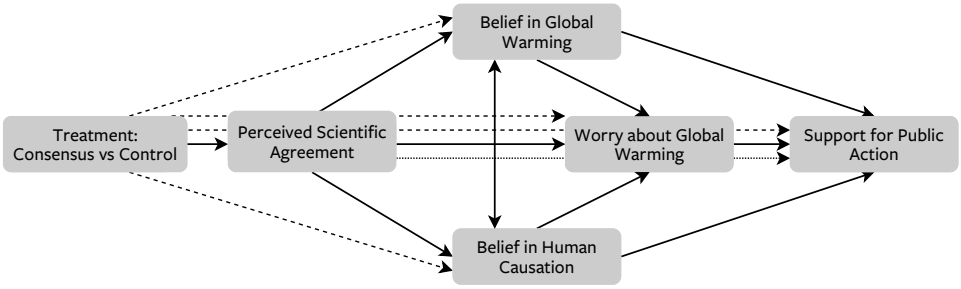
Point estimates and Bayesian posterior highest density intervals at the .95 level

	Personal efficacy	Collective efficacy	Political efficacy	Intended behaviour change	Policy Support
	0.75 (0.7,0.79)				
	0.76 (0.73,0.79)	0.56 (0.51,0.61)			
	0.52 (0.47,0.57)	0.64 (0.6,0.68)	0.62 (0.57,0.67)		
				0.31 (0.27,0.34)	
				0.34 (0.26,0.42)	0.27 (0.23,0.31)

Our survey included items directly translated from the questions used in (van der Linden et al., 2019). Using these data, we constructed an observed variable model more closely related to the original statistical analysis. Note however, that other design differences still prevent treating this as a direct replication – most importantly, our study relies on post-treatment scores only. This meant we had to re-analyse the data used in (van der Linden et al., 2019) and find a workable model for post-treatment scores. After testing the model formulated by (van der Linden, Leiserowitz, Feinberg, & Maibach, 2015) in a pilot and using the large-scale data from (van der Linden et al., 2019), we found significant problems with model fit (in both datasets) due to a large unmodelled residual correlation between 'climate change is happening' and 'climate change is human-made'. We decided to include this relationship in our final model, resulting in a just identified, or 'saturated', model used for estimating regression coefficients (Figure 4D.1).

Figure 4D.1

Observed variable 'replication' model



We use this structural model to estimate two sets of 'free' parameter estimates: one using the 'original' large-scale data (van der Linden et al., 2019), yielding Θ_o, and one using our replication data, yielding Θ_r. In addition, we estimate two 'restricted' parameter sets using our data: one fixing the regression coefficients to the values obtained from the estimation using original data, yielding Θ_{fo}, and one fixing the regression coefficients to 0 (the 'null model') yielding Θ_{fo}.

To compare the different sets of fixed parameter estimates taken together (comparing Θ_{fo} and Θ_{f0}), we used Bayes factors (Verhagen & Wagenmakers, 2014), expressing the relative degree to which model predictions using the different parametrisations fit the data. Next, we investigated point estimates and credible

intervals, calculated as the highest density intervals of the posterior (HDI), of the two 'free' estimates, based on original data and replication data (Θ_o and Θ_r). To interpret these comparisons, we used the following heuristic for each parameter:

- Strong evidence for replication: the original HDI contains both the new estimate and new HDI
- Evidence for replication: the original HDI contains the replication estimate, but the replication HDI exceeds the original one
- Inconclusive evidence: the replication mean lies outside the original HDI, but the replication HDI contains the original mean
- Evidence against replication: neither mean is contained in the other study's HDI, but the HDIs overlap
- Strong evidence against replication: the HDIs do not overlap

After an initial batch of target N=225, we conducted the first estimation and evaluated our pre-defined rules for stopping or continuing data sampling: finding strong evidence for or against replication of all parameters (see pre-registration). As the condition for stopping was not met after the first, second (N=146), or third batch (N=106), we turned our attention to the latent variable model and different treatment conditions (see main article) as per our pre-registered sampling plan.

RESULTS

Table 4D.1

Treatment effects original and 'replication' data (compared to control)

	Estimation model		
Dependent Variable	**'Replication' / Germany (Θ_r)**	**'Original' / US (Θ_o)**	**Interpretation**
Perceived scientific Agreement	0.07 (-0.01,0.14)	0.37 (0.34,0.39)	Lower (strong evidence)
Climate change is real	-0.02 (-0.08,0.05)	-0.13 (-0.15,-0.1)	Higher (weak evidence)
Climate change is human made	-0.05 (-0.11,0.01)	-0.13 (-0.15,-0.11)	Higher (weak evidence)
Worry about climate change	0 (-0.06,0.05)	-0.01 (-0.03,0)	Replication (weak evidence)
Support for public action	-0.04 (-0.09,0.01)	-0.04 (-0.05,-0.02)	Replication (weak evidence)

Standardised regression point estimates and Bayesian posterior highest density intervals at the .95 level.

While the Bayes factor comparisons clearly favoured the null model (Θ_{fo}) over the model with coefficients fixed to the large-scale 'original' model (Θ_{fo}), we did not find evidence considered conclusive concerning all parameters of interest before we had reached our maximum allocated sample for this stage. Nonetheless, the results presented here, in our view, present a relatively clear picture in two regards: First, the effects of simple consensus messages on perceptions of scientific agreement or the other variables directly are close to zero. This is in contrast to the estimates from the US context, where the effects on perceived scientific agreement are considerable, but partially offset by direct negative effects on climate science beliefs (see Table 4D.1, including a verbal interpretation of the evidence obtained). Both in Germany and the US, the direct effects on worry about climate change and support for public action are close to 0, reflecting the fully mediated structure of the model in the US.

Table 4D.2

Model regressions using original and 'replication' data

		Model		
Dependent variable	**Predictor variable**	**Replication / Germany (Θ_r)**	**Original / US (Θ_o)**	**Interpretation**
Climate change is real	Perceived scientific agreement	0.51 (0.49,0.53)	0.5 (0.44,0.56)	Replication (weak evidence)
... is human made	Perceived scientific agreement	0.54 (0.52,0.56)	0.56 (0.51,0.62)	Replication (weak evidence)
Worry about climate change	Perceived scientific agreement	0.02 (0,0.04)	0.09 (0.01,0.16)	Higher (weak evidence)
	Climate change is real	0.57 (0.55,0.59)	0.21 (0.14,0.29)	Higher (strong evidence)
	Climate change is human made	0.29 (0.27,0.31)	0.46 (0.39,0.53)	Lower (strong evidence)
	Perceived scientific agreement	0.06 (0.04,0.08)	0.18 (0.12,0.24)	Lower (strong evidence)
Support for public action	Climate change is real	0.25 (0.22,0.27)	0.11 (0.05,0.18)	Higher (strong evidence)
	Climate change is human made	0.25 (0.22,0.27)	0.28 (0.21,0.35)	Replication (weak evidence)
	Worry about climate change	0.37 (0.35,0.4)	0.38 (0.31,0.44)	Replication (weak evidence)

Standardised regression point estimates and Bayesian posterior highest density intervals at the .95 level

Second, as hypothesized, perceptions of scientific agreement are a strong predictor of climate science beliefs, worry about climate change and indirectly support for public action. Table 4D.2 presents the standardized posterior means and highest density intervals at 0.95 level from the freely estimated model using German data (θ_r) and from the estimate based on the large-scale replication data from the US (θ_o). Overall, these results appear to lend support to the idea that the mediation part of the gateway belief model is valid in Germany as well: perceptions of scientific agreement are a key belief in predicting downstream variables, and climate science beliefs (that climate change is real, and human made) and worry about climate change act as mediators between perceived scientific agreement and support for public action.

REFERENCES

Linden, S. L. van der, Leiserowitz, A. A., Feinberg, G. D., & Maibach, E. W. (2015). The Scientific Consensus on Climate Change as a Gateway Belief: Experimental Evidence. PLOS ONE, 10(2), e0118489 8. doi: 10.1371/journal.pone.0118489

Linden, S. L. van der, Leiserowitz, A., & Maibach, E. (2019). The gateway belief model: A large-scale replication. Journal of Environmental Psychology, 62, 49-58. doi: 10.1016/j.jenvp.2019.01.009

Verhagen, J., & Wagenmakers, E.-J. (2014). Bayesian Tests to Quantify the Result of a Replication Attempt. Journal of Experimental Psychology: General, 143(4), 1457–1475. doi: 10.1037/a003673

De manier waarop wij, als maatschappij, over klimaatverandering communiceren, bepaalt hoe wij de uitdaging die deze eeuw beheerst begrijpen, en mogelijkerwijs overwinnen – of hoe wij de plank misslaan. In dit proefschrift betoog ik dat publiek discours over klimaatverandering een sociaal kantelpunt kan bereiken dat wordt gekentekend door een fundamentele verschuiving in publieke opinie, de posities van politieke partijen en mediaberichtgeving.

Mijn empirische onderzoek, dat Duitsland en de Verenigde Staten vergelijkt, ondersteunt het standpunt dat in Duitsland deze cruciale grens is overstegen: publieke controversie is hoofdzakelijk gericht op het vinden van oplossingen, en de media benadrukt overwegend de consensus over het belang om uitstoot voor het midden van deze eeuw geheel te verminderen. De Verenigde Staten daarentegen lijden onder een gebrek aan verbinding tussen de publieke opinie en hoe de media over het onderwerp rapporteert, waardoor publieke controversie en vermeende verschillen tussen aanhangers van de twee grootste partijen vermoedelijk worden verergerd. Zodra het kantelpunt is bereikt en gepasseerd, zijn, zoals mijn bevindingen aantonen, de communicatiestrategieën en handelswijzen die deze verandering bewerkstelligden waarschijnlijk niet langer effectief.

Er is dringend behoefte aan een snellere en eerlijkere transitie naar een economie en maatschappij zonder broeikasuitstoot. Om deze transitie te verwezenlijken kunnen de mensen achter de communicatiekanalen leren van het gepresenteerde materiaal om vooruitgang te boeken in het gesprek. Door geofysische en sociaalwetenschappelijke inzichten over klimaatverandering en de impact ervan op mensen te depolitiseren kunnen zij de basis leggen voor een geïnformeerde discussie over de verschillende oplossingen. Hierdoor kunnen de controversiële politieke debatten die noodzakelijk zijn om beslissingen te nemen over hoe de wereld in de toekomst wordt vormgegeven ondersteund worden.

How we, as societies, communicate about climate change shapes how we understand and possibly overcome this century-defining challenge – or fail to do so. In this dissertation, I argue that public discourse about climate change can face a social tipping point that is marked by a fundamental shift in public opinion, political parties' positions, and media reporting.

My empirical research, comparing Germany and the United States, supports the view that the former has surpassed this crucial threshold: public controversy is predominantly focused on finding solutions, and the media overwhelmingly emphasise consensus around the need to reduce emissions by mid-century. In contrast, the US suffers from a disconnect between public opinion and how media report on the issue, likely aggravating public controversy and perceived differences between supporters of the two major parties. As my findings indicate, once the conversation has 'tipped over', the communication strategies and practices that helped bring about this development are likely no longer effective.

We direly need a faster and more just transition to an economy and society free from greenhouse gas emissions. To help materialise it, communication practitioners can learn from the cases presented to keep moving the conversation forward. By depoliticising geophysical and social scientific insights about climate change and its impact on humans, they can build the foundation for an informed discussion about different solutions to underpin the controversial political debates needed to make future-defining decisions.