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Climate change, public opinion and the media in Italy and Germany

Relatore
Prof. Federico Neresini

Laureando
Johanna Isabel Roellecke
n° matr. 1104391 / LMSGC

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1 Introduction

For some time now large part of the world's community (from political leaders, scientists, and NGOs to celebrities and average citizens) has been of the opinion that human-induced climate change constitutes a major threat to the planet and, thus, to the future of humanity. Only recently, on the occasion of the 21. United Nations climate conference, UN Secretary-General Ban Ki-moon, has called the issue "the defining challenge of our time"[1]. Such high levels of public concern are based on alarming evidence gathered over previous decades by scientists from various disciplines, demonstrating how the warming of the Earth's average temperature has wide ranging implications, not only for ecosystems and human health but also for society as a whole, posing a threat to economies and global security (e.g. civil conflict and migration).

While policy makers around the world have been trying to tackle the problem on the global, national and local level, the success of such efforts substantially depends on the support and cooperation of the various segments of society, from influential stakeholders such as corporate businesses to individual citizens, not only in terms of a favorable opinion climate and the granting of policy mandates but also in terms of everyday sustainable and climate-friendly behavior. In fact, the causes of anthropogenic climate change are deeply rooted in and intertwined with modern lifestyles and consumption patterns in industrialized nations. Hence, individual citizens and consumers play a key role in both causing and tackling the problem.

On that account, politicians, activists and non-governmental organizations have been aiming at sensitizing public opinion and at promoting awareness and behavioral change in individual members of society, through specially designed policies (e.g. economic incentives), awareness campaigns, protest or public calls to action. In this regard, the media, as a major locus of public discourse and information, have been found to be of paramount importance for promulgating and amplifying the claims of these different actors and for generally focusing public attention on climate change, substantially influencing the way people understand, perceive and ultimately engage with the issue.

[1] See *Secretary-General's remarks at closing of COP21* (Ki-moon, 12 Dec 2015).

Against this background, media representations of climate change and their interaction with public opinion and individual engagement have been of great interest for scholars of various disciplines in the field of social science. In fact, many are the studies that have dealt with climate change media coverage and public opinion. Especially with regards to climate change media coverage, many of these studies have been confined to single national contexts, while, so far, there has been relatively few small-or large-scale comparative research. This focus on single countries, however, has frequently been criticized as a major shortcoming, not only because of the advantages comparative research generally holds, but also because media reporting on climate change as well as public perception of the issue are highly culturally contingent. Thus, and especially in view of global strategies for tackling the issue, cross-national comparative research can be considered as particularly valuable.

The present study therefore aims at making a contribution to the field by comparatively analyzing climate change media coverage and public opinion in two culturally and socio-economically distinct national contexts, Italy and Germany. With respect to climate change media representations and the time period under consideration (2010-2015), these two European countries have, at least to my knowledge, not yet been studied from a comparative perspective. What is more, the comparison between Italy and Germany becomes especially meaningful in view of the fact that both countries are part of the European Union, one of the world's largest greenhouse gas emitters and leading actor in international climate change negotiations with a high degree of policy convergence among its member states.

This thesis can be broadly divided into a theoretical part (Chapters 2-4) and a case study (Chapters 5-7). In the first chapters I will introduce the reader to the subject, historically tracing the way climate change has become a mainstream public issue in many parts of the world. Based on the state of the art of literature in the field, I will then outline and discuss worldwide trends in public opinion on climate change and the various factors that are believed to influence public perception and to constitute barriers to behavioral change. What is more, I will discuss the role the mass media play in publicly communicating climate change, the quality and amount of worldwide climate change media coverage over previous decades and the way the media are believed to influence individuals' perception and engagement with the issue.

The empirical part of this thesis will begin with an introductory chapter in which I will set out in more detail why I have chosen Italy and Germany as cases for this study. Based on data that has been gathered within the context of the European survey framework (Eurobarometer), I will then trace and comment the way in which public opinion on climate change has evolved in both national contexts. Subsequently, I will discuss my findings on the quantitative and qualitative traits of climate change coverage in Italy and Germany, obtained through collecting, counting and analyzing climate-relevant articles published in the two major daily newspapers in Italy (*Corriere della Sera* and *La Repubblica*) and Germany (*Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung*) between 2010 and 2015.

The main purpose of the present study is to gain a better understanding of the way these two elements, climate change media coverage and public perception, have evolved and related to each other in two distinct socio-economic, cultural, political and environmental settings and, furthermore, to determine whether climate change communication in the Italian and German quality press has generally shown the potential for triggering behavioral change in individual members of the audience.

2 Climate change as a public issue

Even though the phenomenon of large-scale climatic change has been debated by scientists since the discovery of the Ice Ages in the mid-1800s (Hulme, 2009), the notion of human-induced global climate change only emerged around the turn of the century in close connection with the, by that time widely accepted, theory that global climate was sensitive to the level of atmospheric carbon dioxide in the atmosphere (Mudge, 1997). Previous research carried out earlier that century had revealed how infrared radiations emitted from the Earth's surface are partly absorbed by the atmosphere causing a rise in the planet's average surface temperature[2] (Weart, 2003), and how atmospheric gases, such as water vapor, carbon dioxide and ozone, can trap infrared radiations more effectively than others (Hulme, 2009). But it was the Swedish physicist Svante Arrhenius who first mentioned the possible impacts of human activities on the global climate, recognizing the possibility that the combustion of fossil fuels could cause a rise in carbon dioxide levels in the atmosphere (*ibid*.). Ironically enough, however, the warming of the Earth induced by the combustion of coal was for Arrhenius at best a positive site effect of industrialization, instrumental in warding off the next glacial era (*ibid*.). In any case, he believed that it would take "a few centuries" (Arrhenius, 1908) for human industrial activities to cause changes in the concentration of carbon dioxide in the atmosphere to a "noticeable degree" (*ibid*.).

Up until the mid-twentieth century the study of climate change was primarily concerned with solving the "notorious puzzle" (Weart, 2003, p. 11) of what had caused the Ice Ages in the distant past, with any notion of anthropogenic climate change largely rejected[3]. Hence, while the hypothesis of future global warming induced by human activities was not the underlying interest of climate scientists (*ibid*.), the study of carbon dioxide concentrations in the atmosphere constituted, if anything, a mere "scientific curiosity" (Howe, 2014, p. 44). Scientists who had put forward theories of human-induced global warming, such as Svante Arrhenius or the British mechanical engineer Guy Stewart Callendar in the 1930s, generally considered such warming to have "relatively benign, or even positive,

[2] The phenomenon was later named the "greenhouse effect".

[3] The idea of anthropogenic climate change stood in direct contrast to the common belief in the "balance of nature" (Weart, 2003, p. 8) and the "religious faith in the God-given order of the universe" (*ibid*.).

consequences for society" (Hulme, 2009, p. 62). Even later on in the late 1950s, when the reality of human-induced atmospheric carbon dioxide rise was being increasingly recognized by the scientific community (Howe, 2014), climatic change did not seem to be conceived as an imminent and serious threat to humanity. In fact, some authors even have argued that concerns raised by scientists about the negative and disturbing impacts of CO_2 related global warming caused by human activities might have partly been instrumental in securing research funding (Howe, 2014; Hart & Victor, 1993). At any rate, these concerns were framed as "vague possibilities" (Howe, 2014, p. 35) and there was a widespread believe among scientists that technological and scientific progress would help to tackle potential future problems induced by rising CO_2 concentrations in the atmosphere (Howe, 2014; Hart & Victor, 1993). Consequently, during the first half of the twentieth century the issue did not appear to be of great interest for the scientific community. The same held true for the broader general public (Corfee-Morlot, Maslin & Burgess, 2007).

Some authors have pointed out how greenhouse warming as a research topic had been little respected before the 1950s (Weart, 1997), and that the field of climatology had generally been little more than a "sleepy backwater" (Weart, 2003, p. 10). This seems to be a rather plausible assumption considering that the "belief that human beings could radically alter natural planetary systems" (Weart, 1997, p. 355) ran directly counter to the "general tenor of educated opinion" (*ibid*.). Other scholars have suggested that it was through the emergence of nuclear weapons that the notion of human-induced climate change gradually gained "legitimacy" (Hart & Victor, 1993, p. 647), while Cold War politics and anxieties have been largely held responsible for the rapid "take off" of climate science in the 1950s, "shaping both the science and politics of climate change through the second half of the twentieth century" (Howe, 2014, p. 11).

Yet, it was only towards the mid-1960s, when scientists began to frame CO_2 as an environmental problem (*ibid*. p. 35), that climate change started to gradually become an issue of wider public interest and concern. This "alteration of perspective" (Hulme, 2009, p. 61) was partly the result of growing scientific evidence of the phenomenon[4] and partly due to a growing awareness among scientists about the impacts of science and human activities on the environment (Corfee-Morlot et al. 2007; Weart, 1993; Howe, 2014). What is more, the trend

[4] By precisely measuring atmospheric carbon dioxide concentrations the chemist David Keeling could prove that CO_2 levels in the atmosphere were in fact steadily rising.

of conceiving carbon dioxide as an environmental pollutant (Howe, 2014) fell on fertile ground with the "broader currents of intellectual thought in the 1960s" (Hulme, 2009, p. 62) and activated a "loose conversation" (Howe, 2014, p. 43) between scientists, policy makers (Corfee-Morlot et al. 2007) and a new wave of environmentalism, mainly emerging in the USA and elsewhere in the Western world (Della Seta, 2000; Hart and Victor, 1993; Liverman, 1999; Gottlieb, 1993). However, anthropogenic climate change as an environmental problem was, by itself, not sufficiently appealing to the broader public. Rather, its success as a public issue derived from the alignment with a number of other environmental public issues increasingly paid attention to by politicians, scientists and environmentalists. At the center of such burgeoning environmental consciousness were concerns about polluting substances, detrimental to humans and ecosystems, and basically byproducts of the rapid economic development in postwar Western societies over preceding years (Della Seta, 2000).

Growing political internationalization of environmental problems, mainly as a reaction to concerns about transboundary air pollution (Knill & Liefferink, 2013), finally culminated in the endeavor to address and tackle global environmental problems for the first time in an international political context (Howe, 2014), at the United Nations Conference on the Human Environment held in Stockholm in 1972. Within this new framework of environmental governance, especially concerned with the impact of human activities on the environment, also the issue of anthropogenic climate change was addressed. It was, thus, the first major intergovernmental environmental conference that helped to raise "more popular awareness" (Hulme, 2009, p. 62) about the impacts of humans on the global climate, and to enhance international collaboration in atmospheric science research (Corfee-Morlot et al. 2007).

However, climate change as a global environmental problem faced difficulties in accessing political agendas, basically due to the lack of an "interested constituency" (Howe, 2014, p. 92). In fact, the Stockholm Conference mainly focused on environmental problems at the local and regional level (Liverman, 1999), which also reflected the "competing development and natural resource interests" (Howe, 2014, p. 92) at stake in the negotiations. With a significant number of restraining factors, such as the issue's diffuse nature, its uncertain impacts, the difficulty to regionally localize those impacts (*ibid*.), the widely different priorities of developed and developing countries (*ibid*.), and a world economy

highly dependent on energy from fossil fuels (Levy & Egan, 2003), it proved difficult to find global solutions. Certainly, these restraints are in part still central to more recent negotiations on climate change (see Hecht & Tirpak, 1995). Consequently, and despite the momentum for climate change policy and climate science, throughout the 1970s relatively little attention was paid to the issue in public discourse and in international environmental politics (Howe, 2014).

Notwithstanding and undeterred by continuing scientific disagreement and controversy[5], the 1970s were, on the whole, marked by enhanced collaboration between scientists and policymakers (Hart and Victor, 1993) and by a gradual shift of paradigm (Corfee-Morlot et al. 2007) among leading climate scientists towards a more proactive advocacy role (Hart and Victor, 1993). In fact, the late 1970s can be identified as another important moment for climate change as a public issue. The first World Climate Conference in 1979, sponsored by the WMO (World Meteorological Organization), resulted in the establishment of a World Climate Program,[6] which also reflected the general trend towards a more practical application of climate science in view of pressing global environmental challenges (Howe, 2014).

The following decade was characterized by growing efforts to create fora for the international assessment of climate change as a global environmental problem, heralding a new phase in climate science characterized by the ever increasing prominence of the "science for policy" (Corfee-Morlot et al. 2007, p. 2753) approach and paving the way for enhanced collaboration between scientists and policy makers (*ibid*.). Intergovernmental and nongovernmental organizations and mechanisms, such as the United Nations Environment Program (UNEP), the World Meteorological Organization (WMO) and the International Council of Scientific Unions (ICSU), started to effectively coordinate climate research and assessment at the international level and to further the "policy relevance of climate research by focusing on societal impacts of climate variability" (Andresen & Agrawala, 2002, p. 43). The Villach (Austria) Conference of 1985 on the "Assessment of the Role of Carbon Dioxide and of Other Greenhouse Gases in Climate Variations and Associated Impacts", jointly

[5] The 1970s were marked by an ongoing debate around whether there was a general trend towards global cooling or global warming (see Howe, 2014).

[6] An international mechanism established in order to "determine the physical basis of the climate system that would allow increasingly skillful climate predictions and projections, develop operational structures to provide climate services and to develop and maintain an essential global observing system fully capable of meeting the climate information needs." (World Meteorological Organization, n.d.).

convened by the three institutions mentioned above, has frequently been described as seminal for the development of an agenda on climate change, both at the national and international level (Franz, 1997). While the first World Climate Conference in 1979 had basically resulted in a comparatively contained call for enhanced understanding of the future course of global climate change in order to plan for the development of human society (Zillman, 2009), the 1985 Villach Conference concluded with "vague but nevertheless striking recommendations for climate change policy" (Howe, 2014, p. 155). Undoubtedly, the Villach outcome reflected the fact that scientists concerned with climate change had begun to take a more proactive stance in trying to push the issue onto the international political agenda (Franz, 1997; Howe, 2014). In fact, the relevance of the event did not lie so much in the presence of groundbreaking new scientific evidence about global warming, but rather in the way the issue was framed as one of political importance (Franz, 1997).

The conference also prompted an increasing convergence between global warming and concerns about the ozone hole (Ungar, 1992). Inspired by the success ozone depletion as a public issue could "score" earlier that same year with the Vienna Convention for the Protection of the Ozone Layer, scientist at the Villach Conference took advantage of what they felt to be a "window of opportunity" (Franz, 1997, p. 18) and drew an explicit connection between global warming and other global atmospheric environmental issues such as ozone depletion and acid rain (*ibid*.). Certainly, the international attention ozone depletion could attract in the mid-1980s was instrumental in pushing global warming on the public agenda. As Howe (2014) puts it, ozone depletion was able to "bridge the gap between regional air pollution, which was subject to existing legal and political frameworks, and global CO_2 -induced warming" (p. 150). As an environmental problem, stratospheric ozone has, just as CO_2 and other greenhouse gases, genuinely global impacts by affecting the Earth's atmosphere "as a whole" (*ibid*. p. 149) and could, therefore, "convey to the general public the concept of a real global environmental threat" (Hecht & Tirpak, 1995, p. 377). As compared to climate change, ozone depletion had the great "advantage" of having a "direct, tangible impact on human health" (Howe, 2014, p. 152), and, thus, could mobilize a much larger constituency of concerned individuals. Nevertheless, the already established international regime for ozone depletion could function as a model for the political framework of climate change (Hecht & Tirpak, 1995), and as an "issue culture" (Ungar, 1998, p. 516) developed

around the atmosphere in the course of the 1980s, ozone depletion constituted the bandwagon climate change activists could jump on.

The growing politicization of the global warming debate in the 1980s, accompanied by increasing media attention (Grundmann, Romberg & Stehr, 2012), "induced a heightening of anxiety" (Hulme, 2009, p. 63) in the general public. During the mid-1980s scientists had altered the way they framed global warming, henceforth emphasizing the immediacy of danger and the urgent need for political action (Franz, 1997). This new mood of concern was then immediately picked up by the media, providing public discourse with new "interpretive packages" (Ungar, 1992, p. 491; Gamson & Modigliani, 1989). Both media and scientific discourse were increasingly centered on "danger and catastrophe" (Hulme, 2009, p. 62), actively contributing to what Ungar (1992) has called a "social scare" (p. 485). Another factor that raised public alarm was the weather, effectively and dramatically intervening in 1988, the year frequently identified in literature as the moment when climate change "hit the mainstream" (Howe, 2014, p. 166; Grundmann et al. 2012), at least in some parts of the world (Hulme, 2009). While the "1980s saw the five hottest summers ever recorded" (Ungar, 1992, p. 490), a series of extreme weather events occurring around the globe[7] were now being associated with the ever increasing greenhouse effect (Der Spiegel, 12 Dec 1988). Furthermore, 1988 was marked by a number of significant events that reflected the general rise in national and international political attention towards the issue (Hulme, 2009): The Toronto Conference, representing the "first major intergovernmental conference on climate change" (*ibid*. p 64), the birth of the International Panel on Climate Change (IPCC), a body created for the international assessment of climate change science, and public statements from high-profile political actors and scientists (*ibid*.).

The story of climate change as a public issue is one of several threads having become more and more intertwined over previous decades. This development certainly sheds light on the social organization of science, on prevailing media practices, the media's role within public discourse, and on how these factors can affect policy agendas. It has often been argued that it was the concerted effort of different actors, such as scientists, environmentalists, politicians and celebrity advocates, that had been vital in pushing the issue onto the public agenda and into the "media spotlight" (Anderson, 2014, p. 63). Furthermore, these societal

[7] Heatwaves and droughts in the United States, China and the Soviet Union and severe floods in Southeast Asia (see Howe, 2014).

actors, publicly appearing as claims makers, have been central for triggering and shaping the mass-mediated public debate about climate change. Especially the entry of political actors and the emerging prevalence of political fora for the discussion of climate change-related issues have been crucial for attracting substantial media attention (Rhomberg, 2012; Hulme, 2009).

However, and as I will discuss further on, climate change would not permanently remain "a problem with 'celebrity' status" (Hilgartner & Bosk, 1988, p. 57). The following years, throughout the 1990s and 2000s, would be characterized by ups and downs in media attention, which certainly also reflects the fact that global warming represents an environmental problem whose impacts have mainly been projected onto the future (Ungar, 1998). Even though scientist have begun to emphasize the urgency of action in view of the dramatic impacts of climate change, global warming is somehow not sufficiently tangible and basically lacks permanently observable impacts (Ungar, 1992). Without a doubt, climate change is now firmly established on the international political and public agenda, but it has often needed the entrance of so-called *focusing events*[8], such as groundbreaking new scientific evidence, celebrity sponsorship[9], or a blockbuster at the box office[10], to raise public awareness and concern and to remind people of the "power of nature and [their] own fragilities" (Giddens, 2008, p. 5).

[8] See Birkland (1998) and Giardullo and Neresini (2015).

[9] Hollywood actor Leonardo DiCaprio spoke out for immediate action against climate change during his acceptance speech at last year's Academy Awards. A recent study points out that DiCaprio's speech had triggered increased social media engagement on the issue, extensive news coverage and "near record levels of online information seeking for climate change" (Leas et al. 2016).

[10] In 2004 *The day after tomorrow* was released, a disaster movie which portrays the dramatic impacts of climate change. Leiserowitz (2004) argues that the movie had direct impacts on the perception of climate change and on behavioral intentions of those who had watched it (p. 34).

3 Public perception of climate change

As mentioned earlier, by the late 1960s environmental issues had become increasingly institutionalized on the public agendas of industrialized nations (Jordan, 2005; Della Seta, 2000). Such heightened concern for the environment has been associated with broader value changes closely linked to the "economic miracles of the post-war era and the emergence of the welfare state" (Inglehart, 2008, p. 145). It has been argued that the gradual shift to post-materialist values, such as autonomy and self-expression, and the emphasis on "quality of life issues" (*ibid*. p.142), have contributed to the emergence of new political movements with new political priorities, including the environment (*ibid*. p. 140). Since then social scientists, policy makers and activists have become increasingly interested in public attitudes towards environmental problems and related policies (Dunlap, 1995). In fact, from the 1970s onwards public opinion on environmental issues has become subject to "regular assessment" (Bord, Fisher & O'Connor, 1998, p. 75) by opinion pollsters, who have questioned citizens on the perceived seriousness of different environmental problems, on their support for government action, personal pro-environmental behavior and on their general willingness to bear the costs for environmental protection (Dunlap & Scarce, 1991). Climate change, however, has started to feature relatively late (from the early 1980s onwards) as an item in public opinion surveys on attitudes towards the environment (Bord et al. 1998; Weart, 2003).

It has often been pointed out that initiatives and efforts to "protect or improve 'public welfare'" (Dunlap, 1990, p. 63) are highly dependent on a favorable opinion climate and that, especially in democratic systems, "policy legitimacy matters at all stages of the policy process" (Capstick et al. 2015, p. 35). Thus, effective policy making requires the public's active contribution by granting policy mandates and by facilitating effective policy implementation (Lorenzoni & Pidgeon, 2006). When addressing climate change, societies are mainly concerned with the mitigation of causes and with the adaptation to impacts (Pongiglione & Cherlet, 2015). For both types of responses individuals play a central role. In fact, the active involvement of citizens is often an inevitable requirement for the successful implementation of climate policies (Wolf & Moser, 2011), not least because individuals actively contribute to the enhanced greenhouse effect through their consumer habits and life style choices. Therefore, policy makers, activists and non-governmental organizations aim at

generating active behavioral change in individuals in order to promote and accomplish the shift towards "more resilient, adaptable, and low-carbon societies" (Whitmarsh & Lorenzoni, 2010, p. 158). What is more, climate change is an environmental problem with extremely wide-ranging and complex societal implications (Stamm, Clark & Reynolds Eblacas, 2000), whose anthropogenic causes are deeply "embedded in the socio-economic organization of our global society" (Pongiglione & Cherlet, 2015, p. 384). The issue, thus, seems to demand an inclusive societal response on the basis of shared responsibilities and shared decisions, where all actors concerned deliberate and collectively reflect on the "type of society they want to live in" (Whitmarsh & Lorenzoni, 2010, p. 158). However, and in line with what has been said above, the public's inclusion in policy debates alone is not sufficient for effectively addressing climate change; it rather needs considerable behavioral and attitudinal change in order to tackle the problem in the long run (Lorenzoni, Nicholson-Cole & Whitmarsh, 2007).

It has been widely argued that people's understanding of climate change, their factual knowledge, their individual perception, and their degree of personal engagement are decisive for the way they ultimately respond to initiatives aimed at tackling the problem (Lorenzoni, & Pidgeon, 2006; Wolf & Moser, 2011). Against this background, public opinion surveys and findings from qualitative in-depth studies[11] on public attitudes towards climate change have become a crucial source of information for policy makers and communicators eager to design effective climate change policies and to generate public support, behavioral change and engagement.[12]

3.1 Trends in public perception over time

As mentioned earlier, since climate change has entered public agendas and people's consciousness in the 1980s, issue salience and intensity of public concern have fluctuated considerably over the last decades. Public opinion polls have revealed significant variation

[11] Here reference is, for instance, made to ethnographic interviews. In 1989 Kempton (1991) has conducted open-ended question interviews with a "small sample of Americans from all walks of life" trying to gain inside into "how ordinary citizens conceptualize global climate change and make value judgements about it" (p. 183).

[12] It must be noted though that data on public opinion is somehow a double-edged sword. In the same way as it is useful for informed decision making, it can be a powerful tool for creating a distorted or biased picture of public opinion. Especially where there are considerable political or economical interests at stake, as is the case with climate change, the political goals of individual actors or interest groups might lead to selective interpretation and abusive usage of public opinion data (Nisbet & Myers, 2007).

over time, across and within countries, in terms of key dimensions, such as perception, knowledge and engagement[13]. Some scholars have attempted to outline and summarize general patterns and trends in public opinion from a historical perspective, taking into account not only large-scale opinion surveys but drawing also on smaller cross-sectional research. Drawing on national and cross-national long-timescale and cross-sectional studies, Capstick et al. (2015) have identified four time periods which reflect general patterns of shifts in public opinion over time. This periodization is probably a useful framework for my purpose of synthesizing the findings from representative polling data integrated with some key findings from small-scale qualitative research.

Data from the 1980s and early 1990s suggest a constant rise in public awareness and concern, coinciding with growing salience of the issue in public discourse throughout the 1980s (Nisbet & Meyers, 2007; Dunlap, 1998). However, compared to other environmental or social issues climate change was perceived as less serious (Dunlap, 1998; Brechin, 2003; Lorenzoni & Pidgeon, 2006). At this early stage, self-perceived knowledge (Brechin, 2003; Nisbet & Meyers, 2007) and actual knowledge (Dunlap, 1998; Kempton, 1991) of the phenomenon were found to be rather limited, without significant differences between respondents from industrialized and developing countries (Brechin 2003). With regards to self-reported knowledge, Dunlap (1998) could show that there were considerable differences at the individual level, in terms of age, education and gender (p. 480), while the confusion of climate change with ozone depletion[14] seemed to be prevalent across countries (p. 482). These findings suggest that people incorporated information about climate change into existing mental concepts (Kempton, 1991; Bostrom, Granger Morgan, Fischhoff & Read, 1994) which tended to delineate the issue according to what Bord et al. (1998) have called a "pollution model of environmental problems" (p. 78). Interestingly, there did not seem to be a significant relationship between levels of education and the application of such mental models (Bostrom et al. 1994). In summary, it can be observed that at this early stage awareness of and concern about climate change were already relatively pronounced (Capstick et al. 2015).

[13] This useful distinction of key dimensions of public opinion has been made by Wolf and Moser (2011).

[14] Kempton (1991) found that there was a widespread belief that aerosols caused climate change.

For the time period from the mid-1990s to the mid-2000s public concern about climate change, especially in the US context, was subject to considerable variation (Brechin, 2003; Capstick et al. 2015; Nisbet & Myers, 2007), although the early 2000s were marked by a strong support for US participation in the Kyoto Protocol (Capstick et al. 2015). However, the perceived seriousness of climate change continued to rank relatively low when compared to other environmental issues (Nisbet & Myers, 2007; Brechin, 2003). Within the European context, Eurobarometer surveys from the early 2000s have shown an overall decline in concern about climate change compared to findings from the late 1980s to mid-1990s. The same findings have also revealed substantial fluctuation across member states (EORG, 2002). Interestingly, southern European countries, such as Greece, Italy and Portugal, expressed more concern about climate change than many northern European countries (Lorenzoni & Pidgeon, 2006). It must be noted though, that Eurobarometer surveys are generally not suitable for direct longitudinal comparison, since the wording and format of the questions have not remained identical over the years (*ibid*.). For the first half of the 2000s, a number of cross-national studies have pointed to an overall increase in concern about climate change, in public support for mitigation policies and in the recognition of the anthropogenic causes of the phenomenon (Capstick et al. 2015). Other studies, carried out during the discussed time period, have found that for many individuals climate change as an issue was rather "distant in both space and time" (Lorenzoni & Hulme, 2009), posing relatively little personal threat (Bord et al. 1998) and being perceived as having repercussion mainly for future generations and developing countries (Lorenzoni & Pidgeon, 2006). At any rate and despite some degree of variation across countries, various opinion polls conducted up to the mid-2000s suggest that over this time period a "popular consensus for action on climate change" was established (Capstick et al. 2015, p. 45; WorldPublicOpinion.org, 2006). Such overall growth in public concern about climate change has been associated with accelerated media coverage of the issue, largely triggered by "growing scientific evidence and political attention" (Capstick et al. 2015, p. 43). This certainly hints at the importance of different societal actors, such as politicians and scientists, for raising public awareness and concern through mass-mediated claims-making activities.

Surveys from the late 2000s have been found to indicate a general rise in skepticism (mainly confined to developed countries) about the reality of climate change and about

whether scientists agreed on its anthropogenic nature (Capstick et al. 2015; Ratter, Philipp & von Storch, 2012), though the majority of respondents in the respective countries still believed in the reality of climate change and in the scientific consensus around the issue (Poortinga, Spence, Whitmarsh, Capstick & Pidgeon, 2011; Shwartz, 2010). From a global comparative perspective, the belief that climate change is caused by human activities was least diffused in the USA (Weber & Stern, 2011). Generally, the period between 2007 and 2010 has been found to be characterized by a "substantial heterogeneity" (Capstick et al. 2015, p. 46) of trends across countries, especially with regard to risk perception and the belief in an anthropogenic component in the causation of climate change. Other cross-national opinion polls have shown that general awareness and self-reported knowledge often considerably diverged from actual knowledge about climate change (Pelham, 2009).

During the first half of the current decade the heterogeneity of trends across countries continued (Capstick et al. 2015). In Europe and in the USA the trend of decline in concern seems to have slowed down (*ibid*.). In Europe for instance, there seems to have been a certain stabilization of levels of concern in recent years, with only slight fluctuations when comparing the years 2011, 2013 and 2015 (TNS, 2015; 2013; 2011). However, since 2011 climate change seems to have lost importance compared to other issues.[15] Findings from another cross-national opinion poll point to an overall decline in concern since 2009, especially in industrialized countries (GlobeScan, 2015). Interestingly, the above cited survey highlights the fact that the global overall level of information about climate change has increased over the last 15 years.[16] At the same time, however, a lack of knowledge with regards to the specific actions that can be taken to tackle climate change at the individual level could be observed in Europe.[17] Furthermore, some scholars have shown that in some cases individuals' beliefs about climate change still diverged considerably from the way the issue is understood by the scientific community. Be that as is may, the application of such

[15] In 2011 climate change was considered to be the second most serious issue facing the world, in 2015 it was rated only the fourth most serious problem facing the world (after poverty, international terrorism and the economic situation).

[16] The report deduced this from the fact that roughly twice as many respondents "blame human-caused climate change or rising CO2 levels for extreme weather events, compared to a GlobeScan poll in January 2000" (GlobeScan, 2015).

[17] In 2015, only 49% of EU citizens said that they had taken some kind of action to tackle climate change. However, when confronted with a list of items of specific actions the percentage rose significantly (TNS, 2015).

misguiding mental models commonly applied in early years seems to have become less frequent (Reynolds, Bostrom, Read & Granger Morgan, 2010).

Table 1. Trends in public perception of climate change over time

Time period	Main features of trends
Early 1980s to early 1990s	• Rising public awareness and concern • Limited knowledge among the general public
Mid-1990s to mid-2000s	• Overall growth in concern with considerable fluctuation in opinion within and across countries
Mid-2000s to late 2000s	• Declining levels of public concern and growing skepticism in some countries (mainly in the United States and in Western Europe) • Strong variations in trends across the globe
Late 2000s to early 2010s	• Heterogeneity of trends continues • Stabilization of levels of concern in some countries

Drawing on these findings from numerous studies on public perception of climate change, it can be deduced that since the earliest cross-national surveys on the issue "a majority of people worldwide" (Capstick et al. 2015, p. 36) has believed that climate change is a somehow serious problem (Brechin, 2003). However, it seems that relatively little priority has been given to the issue of climate change considering that to most people other environmental or social issues have been of more importance. Furthermore, there still seems to be little or incomplete knowledge about causes and impacts of climate change. It is also apparent that public perception, knowledge and attitudes towards climate change have considerably fluctuated over the years and across countries. The drivers and underlying reasons for such change have been subject to much research, in terms of large-scale shifts in public opinion, as well as in terms of individual responses to the issue. A large body of literature has discussed a "wide range of possible explanations" (Capstick et al. 2015, p. 51). While some of these studies have focused on single events or have compared the influence of multiple factors on public opinion on climate change, small-scale qualitative research has

given valuable inside into the dynamics and processes that underlie individual perception and engagement with the issue (Wolf & Moser, 2011).

Some of these findings are certainly useful for explaining broader shifts and aggregate movements in public opinion (Capstick et al. 2015) and can probably best be described as contextual factors. The rapid rise in public awareness and concern throughout the second half of the 1980s and the early 1990s largely coincided with enhanced political and media attention, with a general growth of environmental concern (Capstick et al. 2015), as well as with a series of focusing events, such as extreme weather patterns and elite cues (Ungar, 1992). The relative decline of public concern in the USA towards the middle of the 1990s, after climate change had entered public agendas, has been associated with the attenuation of perceived seriousness and urgency of the issue once the "scare" (Ungar, 1992, p. 493) had cooled down and the "sense of dramatic crisis" (McComas & Shanahan, 1999, p. 33) had dwindled away. The temporary decline in concern around 2002 was associated with events, such as the terrorist attacks in 2001 (Nisbet & Myers, 2007), which probably hints at the finite "carrying capacities" (Hilgartner & Bosk, 1988, p. 53) of public arenas, as well as at the need for "sustained drama" (*ibid*.). Likewise, the large-scale trend of rising skepticism about the reality, urgency and seriousness of climate change observed during the late 2000s, has been ascribed to the eruption of the financial crisis in 2008, which, according to some scholars, points to the fact that people have a rather "finite pool of worry" (Weber, 2010, p. 338). Likewise, incisive events such as the "Climategate" affair in 2009 have been identified as being able to shift public opinion, suggesting that dramatic events have the potential to "sharply alter people's understanding of existing information" (Wood & Vedlitz, 2007, p. 554). Also the increasing politicization of the climate change debate in the USA, which prompted Republican voters to assume "climate skeptical positions" (Capstick et al. 2015, p. 46), has been described as a possible cause of decline in public concern. These contextual drivers of change in public opinion on climate change can in part help to explain and uncover the underlying reasons for aggregate shifts in public opinion, though "there are likely to be complex interrelations between many of the social forces considered" (Capstick et al. 2015, p. 52).

3.2 What shapes perception and triggers engagement?

While the contextual factors mentioned above might help to explain aggregate shifts in public opinion, they provide relatively little insight into the determinants that shape public attitudes and perception of climate change at the individual level. Qualitative research has tried to identify individual and internal factors that determine the way individuals "process information, form their views and come to change their climate-relevant behavior" (Wolf & Moser, 2011, p. 549). Factors, such as identity, cultural worldviews, ideology, political affiliation, personality, knowledge, personal experience, but also demographic factors, such as gender, age, ethnicity and education (Leiserowitz, 2006; Wood & Vedlitz, 2007; Crona, Wutich, Brewis & Gartin, 2013; Weber, 2010; Wolf & Moser, 2011; Weber & Stern, 2011), seem to influence the way individuals perceive and understand climate change, and determine the degree to which an individual becomes cognitively, emotionally and behaviorally engaged (Lorenzoni et al. 2007). Certainly though, these individual factors are mostly themselves "affected by the wider social landscape" (Lorenzoni et al. 2007, p. 449).

It has been pointed out that anthropogenic climate change "challenges virtually every aspect of modern lifestyles" (Lorenzoni et al. 2007, p. 454). In fact, climate change as a phenomenon is closely linked to the cultural, economic and social practices that are deeply rooted in contemporary societies. Therefore, action in terms of behavioral change, is certainly a central part to any possible societal response to climate change (Pongiglione & Cherlet, 2015). In this context, understanding why and how individuals respond to the issue under specific circumstances is of high value for policy makers and communicators who try to promote climate-relevant behavior within the context of governmental or non-governmental initiatives (Nerlich, Koteyko & Brown, 2010). However, and as mentioned above, the way in which people understand, perceive and ultimately engage with climate change is based on the complex interplay of different factors between which there does not necessarily exists a linear relationship. Furthermore, it has been widely recognized that there seems to be a gap between people's degree of awareness and concern about the problem of climate change and the degree to which they actual engage in action to tackle the problem (Lorenzoni et al. 2007).

Topics such as individual risk perception, issue definition, and the underlying cognitive processes and contextual factors that can hinder or facilitate action or policy support have been widely addressed in literature. Most scholars agree on the notion that

values and cultural worldviews, rather than the "forcing function of knowledge" (Howe, 2014), determine and influence the attitude individuals assume towards climate change or other social issues (Leiserowitz, 2006; Wolf & Moser, 2011; Kahan, 2006). This proposition basically dismisses the information-deficit model of science communication by assuming that information is not linearly transferred to the audience and interpreted "at face value" (Wolf & Moser, 2011, p. 552). Rather, individuals tend to filter new information through a "social lens" (Wood & Vedlitz, 2007, p. 554) of preexisting values, beliefs and dominant social interpretations (Kahan 2006; Wood & Vedlitz, 2007; Wolf & Moser, 2011; Weber & Stern, 2011). Hence, individuals seem to rely on "cues and predisposition" (Wood & Vedlitz, 2007, p. 560) when evaluating incoming information.

This assumption has diverse implications for how people are believed to perceive and respond to climate change. Individuals seem to perceive risk related to climate change not merely on the basis of scientific accounts of the threats at stake, but rather seem to be influenced by a "variety of psychological and social factors, including personal experience, affect and emotion, imagery, trust, values and worldviews" (Leiserowitz, 2006, p. 46). In fact, it has been shown that some people tend to perceive climate change as geographically and temporally distant and conceptually abstract, which in turn seems to affect their degree of concern and propensity to take more drastic and demanding action (Leiserowitz, 2006; Weber, 2016). This often perceived lack of urgency also seems to explain why climate change ranks always relatively low in public opinion polls when compared to other environmental or social issues. It has been argued that many individuals draw a distinction between personal and societal risks, as well as between "effects on different scales in space and time" (Lorenzoni & Pidgeon, 2006, p. 80), while perceiving climate change in close relation to their physical environment and "everyday experiences" (*ibid*.). Just like (or maybe also because) climate change as a phenomenon mostly lacks directly tangible impacts, it also seems to be "intrinsically challenging to understand" (Weber & Stern, 2011, p. 317), being characterized by the complex interaction of diverse physical processes and human activities. In consequence, such "cognitive limitations" (p. 254), as Kollmuss and Agyeman (2002) quite appropriately put it, seem to hamper "our emotional engagement and our willingness to act" (*ibid*.).

Some studies have pointed to a number of internal and demographic factors that seem to be predictors for individuals' attitudes towards climate change risks and related policy solutions. For the US context Leiserowitz (2006) has shown that individuals with egalitarian worldviews, as well as those who associate climate change with images that are charged with negative emotions, were associated with higher risk perception (p. 57) and were found to be more likely to support policies designed to tackle climate change (p. 59), whereas more neutral imagery and hierarchist worldviews were associated with lower levels of perceived risk and stronger opposition to climate change policies (pp. 57-59). Likewise, females, minorities, liberals, members of environmental groups and newspaper readers were associated with higher levels of perceived risk and support for climate-relevant policies, whereas white, male conservatives were found to perceive climate change as a smaller risk and were more likely to oppose policies designed to tackle the issue (*ibid*.).

Some scholars have argued that the perception of scientific consensus around the issue might affect key believes about climate change (e.g. climate change is real; climate change is human-induced) and individuals' support for climate change policies (Ding, Maibach, Zhao, Roser-Renouf & Leiserowitz, 2011). Wood and Vedlitz (2007) have shown that people who were confronted with information about climate change and told at the same time that scientist strongly agreed on these facts grew significantly more concerned about the issue (p. 563). This view, however, is contrasted by studies that have found that people tend to perceive scientific consensus in such a way that best fits their preexisting cultural worldviews (Kahan, Braman & Jenkins-Smith, 2011). However, Ding et al. (2011) have confined the latter phenomenon mainly to "highly committed partisans" (Ding et al. 2011, p. 464) who "are motivated to interpret and process information in a biased manner that reinforces their predispositions" (Hart & Nisbet, 2012, p. 703). From this perspective, the theory is probably best applicable to the US context where there is a strong polarization around climate change along party lines**.** Generally, and when considering that "the utility of detailed information varies considerably among people, who pursue different approaches to form their attitudes" (Peters, 2012, p. 189), it is quite likely that people who have clearer ideas about climate change and who recognize that there is a scientific consensus around the issue have also been more attentive and involved with the issue from the outset. In fact, Wood and Vedlitz (2007) have shown that individuals who generally pay more attention to the issue

of climate change seem to be better informed and seem to perceive the issue as more serious (pp. 560-61).

It has also been shown that trust in public authorities and institutional capacity seem to play a crucial role in individual risk perception as well as in individual risk response (Lorenzoni & Pidegon, 2006; Science Communication Unit, 2014). Research has shown that levels of perceived risk seem to increase when public authorities are generally not "well-trusted" (Science Communication Unit, 2014, p. 5) and when their risk management capacities are perceived to be rather low (Earle, Siegrist, & Gutscher, 2007; Lorenzoni & Pidgeon, 2006).

At any rate, the question remains whether concern and policy support automatically translate into individual action. Previous research suggest that this is rather not the case. There often seems to be a *cognitive dissonance*[18] between awareness and knowledge of one's contribution to climate change and one's sense of moral obligation to personally act on the problem (Wolf & Moser, 2011; Lorenzoni & Pidgeon, 2006). This seems to ultimately hinder individual action as the feelings of guilt produced can lead to the employment of strategies of denial as a means to justify or rationalize one's "high consuming lifestyles" (Lorenzoni et al. 2007, p. 453). However, this "internal discrepancy" (*ibid*.) also hints to the widely recognized need for enabling structures that facilitate "climate-relevant" action of willing citizens. In fact, many scholars have pointed to the "social, institutional and practical barriers to public engagement" (Wolf & Moser, 2011, p. 561) which seem to be central to the understanding of what Capstick et al. (2015) have fittingly called "climate change dilemmas" (p. 36).

As mentioned above, also social trust and trust in public institutions seem to play an important role in how people ultimately respond to the risks posed by climate change. Lorenzoni and Pidgeon (2006) have pointed out how people tend to view their individual actions as "pointless in isolation" (p. 85) while often desiring more "institutional accountability" (*ibid*.). Certainly, such views are likely to impact on people's perception of who should be responsible for tackling climate change (*ibid*.). Be that as it may, it has also been shown that there seems to be a general correlation between levels of environmental

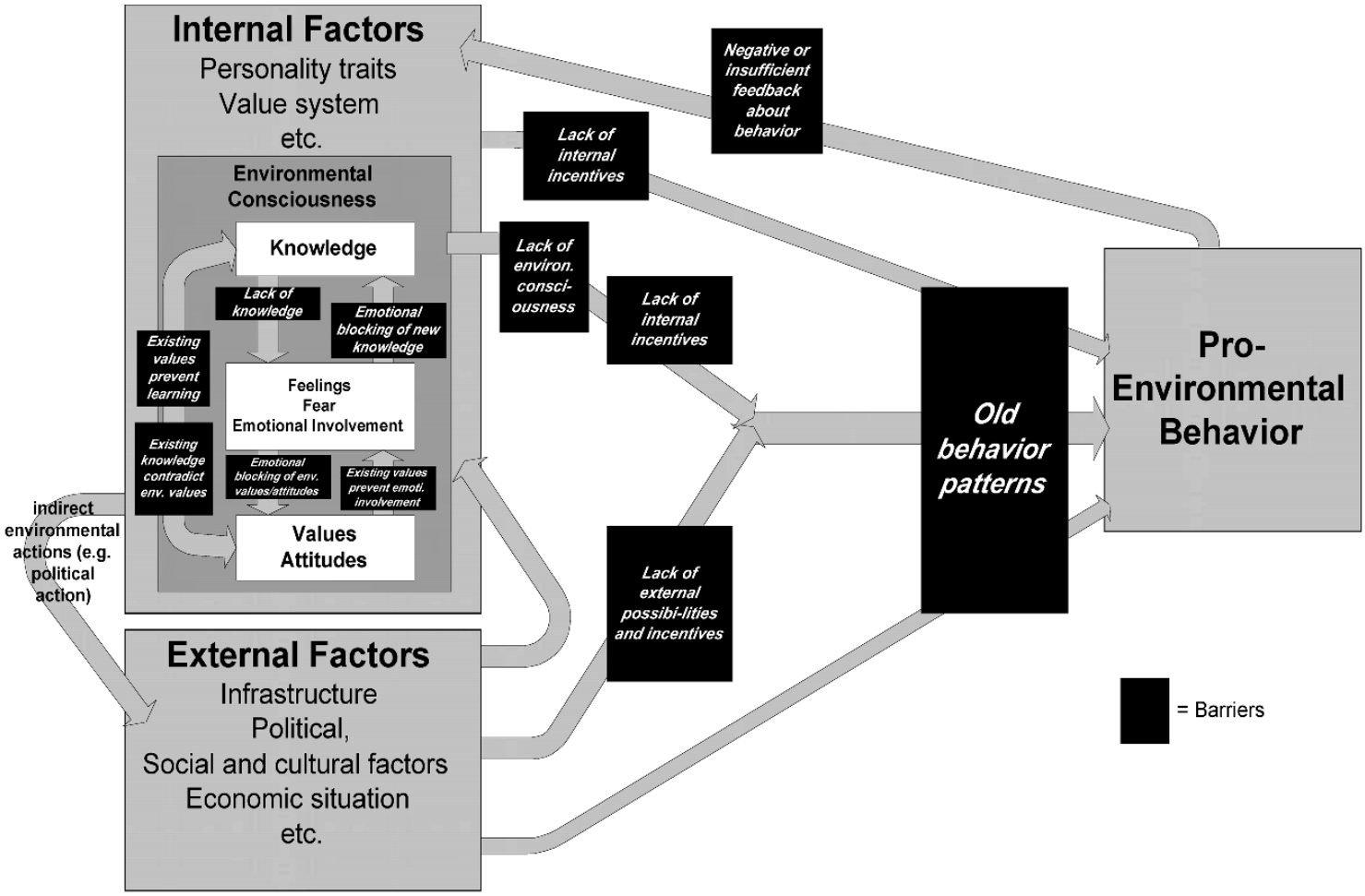
[18] The theory of *cognitive dissonance,* first developed by Festinger (1957), assumes that individuals feel psychological discomfort in the face of "nonfitting relations among cognitions" (p. 3). This inconsistency among an individual's beliefs and opinions is then likely to motivate active attempts to reduce such *dissonance*, as for instance by rationalizing inconsistencies or by avoiding situations and information that create *cognitive dissonance* altogether (*ibid*.).

sensibility (in terms of levels of information, attitudes and commitment) and the degree to which individuals are inclined to believe that they are personally responsible for causing and tackling environmental problems (Sergi, Giardullo, Kazepov, & Maione, 2016).

It has been argued that people willing to take action against climate change often lack the necessary practical knowledge to "channel their energies into appropriate activities" (Lorenzoni et al. 2007, p. 454). Misconceptions about climate change, like confusing its causes, seem to be possible barriers to effective behavioral engagement, even when an individual is in fact concerned and in favor of taking action (Bostrom et al. 1994). Driving less, for instance, has been considered to be more effective than waste separation (Whitmarsh, 2009; Weber & Stern, 2011). Nevertheless, individuals with pro-environmental attitudes often seem to favor "low-cost pro-environmental behavior" (Kollmuss & Agyeman, 2002, p. 252), such as waste separation, over "activities that are more costly and inconvenient such as driving or flying less" (ibid.). Unsurprisingly, when Europeans were asked about the personal actions they had taken to tackle climate change the most frequently mentioned activity was in fact the separation of waste for recycling (TNS, 2015).

The positive correlation between pro-environmental attitudes and such pro-environmental behavior that requires minimal sacrifice (Kollmuss & Agyeman, 2002) seems to point at people's "tendency to *over*estimate" (Whitmarsh, 2009, p. 21) their personal actions. This in turn can probably be interpreted as a means to attenuate the cognitive dissonance this correlation produces. Certainly and as it has become evident, there are numerous and often conflicting factors that determine environmental consciousness and pro-environmental behavior. The model developed by Kollmuss & Agyeman (2002), shown in Figure 1, is certainly useful for synthesizing and visualizing the interrelation of internal and external factors, as well as the "possible barriers to positive influence on pro-environmental behavior" (p. 257).

Figure 1. Model of pro-environmental behaviour[19]



It has become obvious that pro-environmental behavior does not necessarily lead to meaningful action against climate change. Similarly, individuals that contribute to the mitigation of climate change do not necessarily do so intentionally. As a matter of fact, so-called impact-oriented behavior, which is found to be mostly steered by the pursuit of individual benefit (e.g. saving money), can ultimately be even more effective (Whitmarsh, 2009; Kollmuss & Agyeman, 2002). What is more, risk is in large part "socially constructed" (Leiserowitz, 2006, p. 64), implying that people process information and evaluate risk on the basis of a number of individual, cultural and social factors. As research has shown, attitudes and commitment to environmental protection as well as certain

19 Source: Kollmuss and Agyeman (2002, p. 257).

demographic factors seem to influence what types of environmental problems people tend to be most concerned about (Sergi, Giardullo, Kazepov, & Maione, 2016).

In summary, it can be said that enhanced knowledge and awareness will not automatically lead to engagement and personal action. There seems to be no causal relationship between knowledge and concern (Wolf & Moser, 2011; Moser & Dilling, 2011), as little as there seems to be one between knowledge and concern and personal action (Weber & Stern, 2011). As the data on public opinion on climate change suggests, concern and ignorance go hand in hand. Thus, there might be a strong case for assuming that the perception of scientific consensus and the social forces surrounding an issue, in terms of the prevalent social interpretations (amplified by the media), are quite powerful in triggering concern and in shaping public opinion. In this regard, it might be assumed that the mass media play a crucially important role in shaping and influencing the way people perceive and engage with climate change.

Without a doubt, these findings have deep implications for public communication on climate change. It seems that policy makers and communicators need to consider people's underlying motivations for action and inaction and to recognize possible social and practical barriers to change if they aim at making people become personally active in initiatives that might require sacrifices in terms of personal consumer choices or additional taxes. Therefore, some scholars have pointed to the importance of making climate change communication more "personally relevant" (Lorenzoni et al. 2007, p. 455). This would probably result into a more differentiated and "made-to-measure" approach to communication which takes into account the specific features of different population segments.

4 Climate change in the media

As already pointed out in the previous chapters, climate change is neither readily observable as a physical phenomenon nor easy to grasp as a concept. In fact, and as research has shown, the general public and policy makers, heavily "rely upon media representations to help interpret and make sense of the many complexities relating to climate science and governance" (Boykoff, 2011, pp. 2-3; Boyce, 2009; Schmidt, Ivanova & Schäfer, 2013). Mass media, such as television, newspapers and the radio, have been found to be among the most important sources of climate change information for laypeople (Sampei & Aoyagi-Usui, 2009; Taddicken, 2013; Schmidt, 2012; Boyce, 2009; Stamm et al. 2000; Painter, 2010). What is more, the media are believed to have an important function for the democratic process by facilitating political opinion formation and informed decision making (Schmidt et al. 2013; Anderson, 1997; Olausson, 2009; Boykoff & Yulsman, 2013; Boykoff, 2011; Taddicken, 2013). Especially for issues that are rather "unobtrusive" (Carvalho & Burgess, 2005, p. 1467) but where there are high stakes involved, the media are believed to play a crucial role in raising public awareness and furthering public understanding (*ibid*.).

Mass media are also believed to be at the center of what has been called the "cultural politics of climate change" (Boykoff, 2011, p. 3), the process by which the issue's meaning is "constructed and negotiated across space, place and at various scales" (Boykoff, Goodman & Curtis, 2009, p. 136). Climate change does not merely constitute a physical phenomenon, it also constitutes a social one in a variety of ways, encompassing the realms of science, politics, economics and popular cultural (Rhomberg, 2012; Wilkins, 1993; Hulme, 2009). The different meanings the issue assumes, in different contexts and for different actors, do not directly derive from a physical entity, rather these social meanings of climate change are the outcome of discursive practices (Rhomberg, 2012). In this sense, the notion of climate change as a social phenomenon refers, on the one hand, to the way the meaning of climate change is culturally and socially constructed, and on the other hand, to the way such knowledge is socially constitutive. The meaning produced in this way directly "connects with power, regulates conduct, makes up or constructs identities and subjectivities, and defines the way certain things are represented, thought about, practiced and studied" (Hall, 1997, p. 6).

The discursive construction of meaning, and its close relation to "questions of power" (Olausson, 2009, p. 423), also refers to the "continuing struggle for legitimacy between differentially empowered groups" (Carvalho & Burgess, 2005, p. 1458). According to Hilgartner and Bosk (1988), social problems can be understood in terms of specific problem areas in which different arenas of public discourse compete to define the "authoritative version of reality" (p. 58). In fact, climate change is no longer confined to technical debates among scientists but has become part of wider socio-political and economic considerations within public debate (Rhomberg, 2012). Media representations are believed to "link these varied spaces together" (Boykoff & Yulsman, 2013, p. 368), constituting "convergences of competing knowledge" (Boykoff, 2011, p. 3) and serving as the "social clearing-house for claims" raised by the various actors involved in the debate (Trumbo, 1996, p. 270).

In this context, the media also function as *gatekeepers* who decide which issues will be given attention to and how these issues are addressed, controlling in this way the access to the means of mass communication (Schmidt et al. 2013; van Dijk, 1995; Dispensa & Brulle, 2003). Furthermore, by granting privileged access to certain sources, they are believed to "serve as an important institution for the reproduction of hegemony" (Dispensa & Brulle, 2003, p. 79). Therefore, what becomes news is also contingent upon the "relationship between news media, news sources and the wider institutional arena" (Anderson, 1997, p. 9).

Be that as it may, within this process of meaning construction, the media do not only give a voice to the various discourses on climate change, but also act as a "speaker in their own right" (Carvalho, 2007, p. 224). Thus, they do not behave as neutral disseminators who present their audiences with objective accounts of reality. Rather, they are believed to portray different issues according to specific criteria, norms and routines which are "largely determined by the commercial dimension of news production" (Olausson, 2009, p. 423) and, furthermore, contingent upon cultural, ideological and individual aspects (Neverla & Trümper, 2012; Anderson, 2009). On that account, quality and amount of media coverage of climate change is regulated by a number of factors, closely linked to the internal organization and operative logic of journalism and news production, as well as by the broader cultural, economic and political context in which the media operate (Neverla & Trümper, 2012;

Hilgartner & Bosk, 1988). With limited resources[20] at their disposal, the media need to attract and sustain the audience's attention in order to compete in a very crowded market (Weingart, Engels & Pansegrau, 2008). Those issues that are selected for coverage need to be newsworthy, conforming to established news criteria such as drama, novelty, personalization and conflict (Caple & Bednarek, 2013). Consequently, the media are more likely to cover climate change on specific occasions such as natural disasters and international climate summits, or against the backdrop of scientific controversy and political disputes (Neverla & Trümper, 2012), rather than just for the issue's intrinsic news value.

So, while news production is the outcome of a selective and competitive process, media discourses construct and amplify a particular "version" of reality and provide particular angles for interpretation. These representations, then, resonate with the distinct "meaning-making practices" (Carvalho & Burgess, 2005, p. 1458) of individual member of the audience, drawing "both on media(ted) discourses and on lived experiences and social relations" (Carvalho, 2010, p. 172). Therefore, it can be said that the media do more than just inform the general public on socially relevant events and issues, they are also a locus of discursive exchange and a "central forum for the *discussion and legitimization of climate governance*" (Schmidt et al. 2013, p. 1233). This certainly has far-reaching implications for the public communication of the issue, as well as for public understanding and engagement.

4.1 Patterns of climate change media coverage over time

As pointed out above, media production is a process where competing issues and claims struggle to gain access to media agendas. Media attention can thus be defined as a measure for the "outcome of this competitive selection process" (Schmidt et al. 2013, p. 1234). In this way, the amount of attention received from the media can be considered an important indicator for the overall relevance ascribed to an issue (*ibid*.), while the prevalence of certain themes and actors in media accounts largely reflects the "struggle between various stakeholders" (Olausson, 2009, p. 423) over defining it.

Several studies have looked into the quantitative and qualitative development of climate change coverage over time and in different cultural contexts. While some studies

[20] Resources in terms of time, money, expertise, audience attention, availability of news sources , etc.

have identified peaks and troughs of media coverage over particular time periods, others have focused on the particular way the issue has been constructed and dealt with in the media through qualitative text analysis. Most of these studies have been conducted for single countries, while there has, to date, been comparatively little cross-national comparative research (Schmidt et al. 2013; Schäfer, Ivanova & Schmidt, 2012). In fact, different scholars have called attention to the need for more comparative studies (Anderson, 2009; Schmidt et al. 2013; Brossard, Shanahan, & McComas, 2004), inasmuch as such work is crucial for gaining a better understanding of how "different socio-economic, political and cultural contexts shape the reporting of climate science" and climate change-related issues (Anderson, 2009, p. 176). With regards to the few studies that have attempted large-scale comparison between countries, scholars have pointed to their considerable limitations. Small sample sizes, the uneven distribution of news sources across regions (Anderson, 2014) and the fact that media coverage is substantially influenced by structural factors such as newspaper size, financial resources and journalistic culture (Schmidt et al. 2013), make it rather difficult to draw "meaningful conclusions" (Anderson, 2014, p. 72). Against this background, more small-scale in-depth comparative research could certainly make a relevant and substantial contribution. By comparing media coverage and representations of climate change in two distinct national contexts that are yet relatively similar in their socio-economic, cultural and political characteristics, this study might be able to contribute to the critical understanding of cultural differences in media coverage.

Most research in the field has concentrated on newspapers. On that account, and in order to give an overview, I will roughly outline general trends in print media coverage of climate change over time and across countries.

As pointed out earlier, it was only towards the end of the 1980s when climate change as a public issue definitely "hit the mainstream" (Howe, 2014, p. 160). Prior to that, coverage of the issue had been fairly sporadic, especially when "compared to the amount of coverage in most regions around the world today" (Boykoff, 2011, p. 30). Furthermore, at this early stage, climate change media accounts were mainly confined to the realm of science (Rhomberg, 2012; Anderson, 2014; Wilkins, 1993). It has been shown that until the late 1980s, scientists were the most cited news sources in the media, while the "socio-political dimensions" of the issue were largely absent (Anderson, 2014, p. 64; Wilkins, 1993).

Be that as it may, many authors have pointed to a general shift of perspective towards the late 1980s when climate change was rapidly moving up the political agenda (Carvalho & Burgess, 2005; Anderson, 2014; Rhomberg, 2012). Political actors started to populate and dominate media discourses and gradually became the most cited sources in climate change items (Wilkins, 1993). In the course of this process of politicization, media coverage became increasingly centered around "political controversy" (Anderson, 2014, p. 64) and dramatic accounts of climate-related disaster (Carvalho & Burgess, 2005; Hulme, 2009). Thus, when climate change had finally risen to be a high-stakes political issue, that demanded concrete solutions and timely political decisions, media coverage peaked for the first time (Rhomberg, 2012). At the same time, such sharp increase in media attention coincided with a series of extreme weather events and natural disasters around the globe (see Chapter 1). This certainly points towards the media's tendency to translate abstract scientific complexities into tangible and dramatic real world events (Weingart et al. 2008; Boykoff & Roberts, 2007; Neverla & Trümper, 2012). Undoubtedly, the increasing politicization and polarization of climate change in the late 1980s triggered a sharp rise in media attention in many parts of the world (Romberg, 2012).

Interestingly, the German case seems to be an exception to this pattern. Some scholars have pointed to the fact that the “Warning of an impending climate catastrophe” (Weingart, Engels & Pansegrau, 2000, p. 268), proclaimed by a number of German physicists in 1986, was immediately picked up by the mass media and subsequently turned into a political debate (Weidner & Mez, 2008; Rhomberg, 2012; Grundmann et al. 2012; Weingart et al. 2008). The often cited front cover of *Der Spiegel,* portraying the Cologne Cathedral "apocalyptically" submerged in seawater, is certainly emblematic for the mass media's tendency to dramatization and doom-laden imagery (Weingart et al. 2008; Neverla & Schäfer, 2012; Boykoff & Roberts, 2007; Hulme, 2009).

Studies conducted in the USA and the UK have shown that media attention had dipped rather significantly in the early 1990s (Anderson, 2014; Mazur, 1998). Some authors have tried to explain this relative decline by pointing to the media's difficulties in keeping up interest for the topic (Anderson, 2014; Ungar, 1992). Scenarios of doom and disaster had failed to occur (Carvalho & Burgess, 2005; Ungar, 1992) and climate change, just as most

scientific issues, seemed to have relatively little news value by itself[21] (Weingart et al. 2000). Other scholars have pointed to the entry of new actors into the scene of public debate. By the early 1990s politicians and special interest groups, who "de-emphasized the human contribution to climate change and called attention to the costs of action" (Boykoff, 2011, p. 13), increasingly dominated media discourses (McComas & Shanahan, 1999; Neverla & Schäfer, 2012). At the same time, some conservative media outlets began to restrain from reporting on climate change since the issue and its possible solutions suddenly started to become "dangerous to financial interests" (Anderson, 2014, pp. 65-66). What is more, the early 1990s economic recession and the Gulf War have also been made responsible for supplanting climate change-related issues (Anderson, 2014; Trumbo, 1996). At any rate, this trend of rather incisive decline in media coverage was mainly confined to the US and the UK. During the same time period, German and French media coverage, for instance, seemed to be more stable, though rather focused upon climate-relevant political events (Brossard et al. 2004; Weingart et al. 2008). Generally, these cross-cultural differences may also hint at the fact that policy discourse and media discourse often seem to be "deeply intertwined" (Olausson, 2009, p. 432; Carvalho & Burgess, 2005).

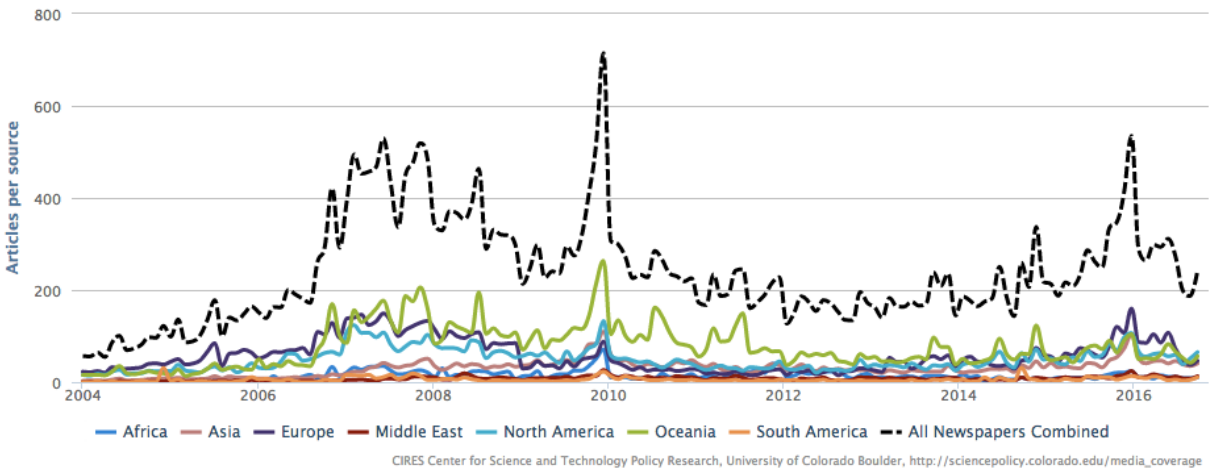
Towards the late 1990s in occasion of the Kyoto conference media coverage rose significantly in many parts of the world, such as Europe, North America, Oceania, India and Indonesia (Schmidt et al. 2013; Schäfer et al. 2013; Boykoff & Roberts, 2007). Also other internationally relevant events triggered peaks in media coverage, such as the release of the second and third assessment report of the Intergovernmental Panel on Climate Change in 1995 and 2001 (Boykoff & Roberts, 2007). However, the most pronounced increase in media coverage worldwide occurred between 2003 and 2007 (Anderson, 2014; Schäfer et al. 2013; Boykoff & Roberts, 2007). The sharp rise in coverage has partly been attributed to a number of focusing events that drew attention to the issue (e.g. the coming into force of the Kyoto Protocol, the G8 Summit, hurricane Katrina in 2005; the Stern Review, Al Gore's Academy Award-winning documentary *An Inconvenient Truth* in 2006; the *IPCC Fourth Assessment Report* and the UN climate change summit in Bali in 2007). Furthermore, this development might partly be due to the "mainstreaming" of climate change into all kinds of news sections,

[21] Some authors have pointed out that science issues are often intrinsically difficult to convey to a mainstream audience as they are often complex, equivocal, surrounded by uncertainty with relatively little potential for drama and surprise (Neverla & Trümper, 2012).

ranging from science, politics and energy security to lifestyle issues and popular culture (Anderson, 2014; Boykoff, 2011; Neverla & Trümper, 2012).

It has also been argued that media attention to climate change seems to be generally influenced by a number of macro-level factors, such as a country's vulnerability to climate change impacts, the degree of carbon-dependency of national economies and the degree of pressure to pursue mitigation efforts. Media coverage seems to be more pronounced in those countries that are more susceptible to climate change impacts, while media attention in countries with higher obligations under the Kyoto Protocol "generally concurs with their varying carbon dependency" (Schmidt et al. 2013, p. 1243).

Figure 2. 2004 - 2016 world newspaper coverage of climate change or global warming[22]



The Copenhagen climate summit (COP 15) and the "Climategate" affair in 2009 seem to have triggered considerable media attention peaks worldwide (Anderson, 2014). However, Boykoff and Yulsman (2013) have pointed to a continuing downwards trend in the USA since 2007. These authors have attributed this rather pronounced decline to the advent of more pressing issues, such as the economic recession, as well as to the general "decline in science coverage in the context of corporate disinvestment in newsrooms" (p. 361). In the aftermath of the Copenhagen "debacle", climate change "failed to surface very prominently in news outlets around the developing world" (Anderson, 2014, p. 70). This has partly been ascribed to the fact that "many actors (including journalists)" (Schmidt et al. 2013, p. 1241) were

22 Source: McAllister et al. (2016).

rather frustrated by the "slow progress in international climate politics" (*ibid.*). However, evidence suggests that 2013 marked the "end of a three-year slide in climate change coverage", as climate change was increasingly reported on in connection with energy issues and "wacky weather" (Fischer, 2014). The Paris climate summit (COP21) in December 2015 certainly "made headlines and led news bulletins across the globe" (IFAD, executive summary, 2016). However, it has been shown that, during the months before and after the event, "coverage on climate change significantly fell off the radar of major media outlets across Europe and the United States" (IFAD, executive summary, 2016).

In summary, then, it can be said that despite several peaks and troughs, climate change coverage has increased over previous decades in many parts of the world (Schmidt et al. 2013; Schäfer et al. 2012; Never & Schäfer, 2012; McAllister et al. 2016). Furthermore, there seem to be significant differences in coverage patterns across countries, in both quantitative and qualitative terms (Anderson, 2014), largely linked to a number of political, cultural and socio-economic factors. The overall upwards trend might be explained by the concerted efforts of different actors who have struggled to bring the issue to public attention (e.g., politicians, celebrities, NGOs, think tanks), but also by growing scientific evidence and the increasing politicization and institutionalization of climate change at national and international levels (*ibid.*).

Table 2. Trends in climate change media coverage over time

Time period	Main features of climate change coverage
Mid-1980s to late 1980s	• Fairly sporadic media coverage of climate change • Scientists were by far the most cited sources in climate change stories • Little emphasis on socio-political implications of climate change
Late 1980s to early 1990s	• Entry of political actors into media discourse • Dramatic rise in media attention • Emphasis on political controversy, natural disasters and extreme weather events

Time period	Main features of climate change coverage
Early 1990s to mid-1990s	• Media attention dipped considerably in some countries • Entry of climate change skeptical actors and interest groups (especially in the USA and UK)
Mid-1990s to early 2000s	• Peaks of media attention around specific climate-relevant events (Kyoto summit, IPCC reports, extreme weather events)
Mid-2000s to late 2000s	• Large increase in media coverage worldwide during the mid-2000s • In many countries media attention levels remained relatively high until the end of 2009
Early 2010s	• After Copenhagen summit in 2009 drastic downturn in media coverage in many countries • Since 2013 signs of slight improvement • COP21 in 2015 attracted substantial media attention

4.2 Media coverage, public opinion and individual behavior

Given the importance ascribed to the mass media in informing the general public on socially relevant but intangible and complex issues such as climate change (Neverla & Taddicken, 2012), and considering the importance of public opinion for the support of climate change-related policies and individual actions, a deeper understanding of the relationship between media coverage of climate change and audience reception becomes crucially important. In fact, there has been an increasing number of studies addressing not only coverage patterns and the particular ways in which climate change is portrayed in the media, but also whether and how exposure and attention to climate change representations affect the audiences' attitudes and behavior.

The media have been frequently held responsible for common misconceptions about climate change. Their tendency to "episodic" coverage of climate change, centered around dramatic events and individual claims-makers rather than on more "systemic concerns" (Stamm et al. 2000, p. 219; Boykoff & Boykoff, 2007), has been blamed for

generating considerable "public inadequacies" (Stamm et al. 2000, p. 219). Nevertheless, it has also been shown that certain climate change-related key facts seem to be successfully conveyed by the media. Stamm et al. (2000) have found that awareness about the connection between fossil fuel consumption and climate change was "significantly related" (p. 234) to the use of media, such as television, newspapers, magazines and books. It has been argued, though, that the relationship between media use and knowledge is probably best understood in terms of correlation and that personal engagement with the issue is likely to motivate "different patterns of media use" (Stamm et al. 2000, p. 232).

Huang (2016) could demonstrate a positive relationship between media use and behavioral intentions. However, this author's findings also suggest that "environmentally conscious people are more likely to absorb global warming messages from the media" (pp. 2210-2211) and, again, that they are generally more likely to expose themselves to these particular media items. Generally, then, it can be said that media use is "often driven by prior interests and motivation" (Zhao, Leiserowitz, Maibach & Roser-Renouf, 2011, p. 718) and that "attention to news is a much stronger predictor of news learning than simple exposure" (*ibid*.).

Be that as it may, and as discussed earlier, factual knowledge about climate change does not automatically lead to climate-relevant attitudinal or behavioral change. Furthermore, the mass media do not objectively transmit "facts" about climate change, rather they actively contribute to the construction of climate change as a social phenomenon, by emphasizing certain aspects of the issue, by reporting on the issue in specific situations and contexts, and by attributing responsibilities and authority to some actors rather than others.

Recognizing the centrality of the mass media in public discourse, scholars have been interested in the media's impact on public opinion and individual behavior since the early twentieth century (McQuail, 2010). While initial approaches in mass media research supposed that potent propaganda messages had a direct and immediate impact on "passive and isolated individuals" (Happer & Philo, 2016, p. 136), a more recent stream of research, rooted in a social constructivist approach to media effects, basically assumes that the media "tend to offer a 'preferred' view of social reality" (McQuail, 2010, p. 459) which can, under certain circumstances, affect people's value judgements, attitudes and behavior. It has been believed that whether and how the audiences respond to the interpretations offered by the

media, depends on their existing beliefs, predispositions and on the interpretative schemas at their disposal (Cacciatore, Scheufele & Iyengar, 2016; McQuail, 2010; Scheufele & Tewksbury, 2007). Thus, from this perspective the media have "potentially strong attitudinal effects" (Scheufele & Tewksbury, 2007, p. 11) but their influence is basically "negotiated" (*ibid*.). Although the relationship between the media, public opinion and behavior has been subject of much debate (Happer & Philo, 2016; Neresini & Lorenzet, 2014), and while the conceptualization and operationalization of different media effects, such as *framing* and *agenda setting*, is a contested issue among scientists (Scheufele, 2000; Cacciatore et al. 2016), some of these effects may be partly useful for assessing the relationship between climate change coverage, public opinion and individual engagement.

Evidence suggest that the media perform an agenda-setting function by focusing public attention on particular issues (McCombs, 2004). The theory of agenda-setting (McCombs & Shaw, 1972) assumes that those issues that receive most attention in the media, in terms of quantity and "relative placement" (Scheufele & Tewksbury, 2007, p. 11), become more salient among the audience (McCombs, 2004). Accordingly, the media do not only provide individuals with information about public issues, but readers, viewers and listeners do also learn "how much importance to attach to a topic on the basis of the emphasis placed on it in the news" (McCombs, 2000, p. 1). It has frequently been assumed that the media have contributed to raising public awareness about climate change. This has become especially evident during the late 1980s when climate change rose to public prominence, but also over subsequent time periods media coverage has increased in conjunction with public awareness (Ward, 2009, p. 59; Corbett & Durfee, 2004; Nisbet & Myers, 2007). Similarly, Happer & Philo (2016) have argued that the decline in coverage in recent years seems to have attenuated public attention and the priority ascribed to the issue. Furthermore, these authors have argued that such decline might have "played a role in inhibiting behavioural commitments" (*ibid*. p. 143). Evidence suggests that the decline in media coverage also impacts on issue salience in social media where discussions are in large part stimulated by mainstream media agendas (Newman, 2011; Happer & Philo, 2016). This certainly hints at the media's potential to shape people's perception of climate change in an increasingly fragmented media environment.

However, while the media suggest to people *what* to think about, the question remains whether they also influence *how* people think about an issue. Some scholars have assumed that this is indeed the case. Mazur (1981) has argued that there seems to be a correlation between public opposition to a given technology and the amount of attention the media pay to the scientific controversy surrounding that particular technology (p.109). Also Sampei & Aoyagi-Usui (2009), when assessing the influence of media coverage on public concern about climate change in Japan, could show that rising media coverage correlated with shifts in public opinion. However, these authors also point to the importance of taking into consideration not only the amount of media coverage but also its content, since previous research has shown that the way in which information is presented in a given context can influence people's perception and choices (p. 211). It has, for instance, often been argued that frames and thematic emphasis in media messages can have considerable impact on how an issue is perceived by the audience (Painter, 2013; Happer & Philo, 2013; Corbett & Durfee, 2004, Moser, 2010).[23] Frames can be constructed through linguistic devices and discursive means, using key words, metaphors, concepts, as well as "non-verbal or visual prompts" (Painter, 2013, p. 46; Antilla, 2005), providing in this way a specific "perspective from which a reader or viewer can interpret a problem" (Painter, 2013, p. 46).

So how and under what conditions do media representations affect the audiences in terms of attitudinal and behavioral change? Conducting an experimental focus group, Happer and Philo (2016) could show that the impact of new information about climate change was much stronger when participants felt that they were personally affected by the consequences of climate change and when they could establish a direct link with personal experiences. Although such information seemed to have had an immediate impact on people's attitudes, it did not trigger any concrete intentions for behavioral change (p. 144). The authors could show that those participants that had actually changed their behavior in the long run were mainly individuals that had already disposed of a general "openness to behave more 'ethically'" (p. 145), or who felt that climate change would directly affect their lives. The majority of participants continued to manifest a considerable discrepancy between awareness

[23] Most research conducted in the field of climate change communication has made reference to framing, as conceptualized by Entman (1993), as the selection of certain aspects of a "*perceived reality*" making these aspects "*more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation* for the item described" (p. 52).

and concern on the one side and the lack of action on the other (*ibid*.). Thus, the impact of new information on attitudes and behavior seems to be rather short-lived and, as mentioned above, contingent upon people's existing believes and predispositions (p.146).

Also with regards to the media's role in generating inaction and disengagement, individual characteristics seem to be of paramount importance. It has been shown that the "general distrust of political figures and the attendant perception of individual powerlessness" (Happer & Philo, 2016, p. 147) become a "crucial factor in dismissing arguments about the need to act" (p. 142). Certainly, media accounts that emphasize uncertainty and disagreement among scientists are likely to reinforce such predispositions to inaction and disengagement.

Painter (2013) could demonstrate that in many countries media frames of uncertainty and disaster are much more frequent than frames of opportunity and solution. However, the "language of fear and disaster" (*ibid.* p. 47) seems to be fairly effective in provoking disengagement "particularly when not accompanied by positive messages or concrete examples of what can be done" (*ibid*. p. 35; Wolf & Moser, 2011). Furthermore, some scholars have noted that ordinary citizens are rarely protagonists in media stories about climate change (IFAD, 2016). It has been argued that "the mainstream media's conventional tendency to develop narratives about the actions of governments and inspiring figures in driving change, rather than the more nuanced picture of the role of the collective, and of the individuals within it" (Happer & Philo, 2016, p. 147), might ultimately nourish feelings of impotence and "apathy" (Painter, 2013, p. 48).

Generally, it has been shown that self-efficacy and the way in which individuals perceive themselves as agents of change are important predictors of climate-relevant behavior (Huang, 2016; Happer & Philo, 2016). In sum, then, it might be said that the media have the potential to "cultivate dispositions to action or inaction" (Carvalho, 2010, p. 172) by constructing political possibilities and by influencing "people's view of their own position in the chessboard of politics" (*ibid*. p. 176).

It has become evident that the media play a crucially important role in the public understanding of and societal response to climate change, not only constituting a major source of information on climate change for the general public, but also being a key player in the "production and transformation of meanings" (Carvalho, 2007, p. 224). Furthermore, findings from the different studies presented in this section suggest that the way climate

change is framed, in terms of contextualization, presence and absence of specific actors and implicit attributions of responsibility and authority, seems to influence the way people perceive and engage with the issue. Certainly, these effects are "not necessarily linear and direct" (Taddicken, 2013, 48; Neverla & Taddicken, 2012) and the relationship between media and public opinion might generally be best understood in terms of correlation rather than causality (Neresini & Lorenzet, 2014). In summary, it can be ascertained that media representations seem to facilitate attitudinal and behavioral change if certain individual and contextual characteristics are in place (Neverla & Taddicken, 2012). On that account and in order to improve climate change communication, it is certainly essential to gain in-depth understanding of how the meaning of climate change is differently constructed by different media in different cultural, socio-economic and political realities (Anderson, 2009), and how such constructed meaning effects individuals' perception and behavior. As I will set out in more detail in the following chapter, the present study therefore aims at making a contribution to the field, by trying to gain an understanding of how climate change reporting and public opinion dynamics relate to each other in two distinct national contexts.

5 Case study: Italy and Germany

The previous chapters of this study have dealt with climate change as a public issue of considerable societal relevance, not only from a historical and cross-national perspective, but also with regards to particular key dimensions such as public opinion and media discourse. It has become evident that the rise of climate change to public prominence had been intrinsically tied to growing mass media attention and the salience of particular actors in media discourses. Furthermore, it has been shown that the development of public opinion on climate change seems to be rather closely correlated to patterns of media coverage, in qualitative and quantitative terms.

The previous sections have also highlighted the fact that there are considerable differences in media coverage and public opinion over time and across countries. Climate change, as pointed out above, is an issue with drastic potential impacts on the world's society as a whole with the need for timely political decisions that depend on public consent and individual and societal disposition and preparedness to behavioral change. On that account, it becomes crucially important to understand how media discourses about climate change are differently configured in different national contexts, and how these discourses effect public opinion, policy response and personal engagement in different ways.

As pointed out earlier, many scholars have called attention to the need for more cross-national comparative research in climate change communication, not only because climate change is a truly global problem but also because comparison can be "central for assessing how universal certain findings are, and for discovering relationships between social phenomena" (Schmidt et al. 2013, p. 1234; Hallin & Mancini, 2004). What is more, some scholars have emphasized the "wealth of practical knowledge and experience" (Esser & Hanitzsch, 2012, p. 5) cross-national comparative research can offer, by showing "a wide range of alternative options, problem solutions, and trajectories" (ibid.) that might be adapted to new contexts.

This study will try to make a contribution to the field by comparatively analyzing media coverage and representations against the background of public opinion data in two European countries, Italy and Germany. For both countries, studies concerning climate change communication in the media have been conducted in the past. Holt and Barkemeyer

(2012) have conducted a large-scale study comparing media attention to climate change and sustainable development in 39 countries, including Italy and Germany. However, their research is limited to media attention patterns in quantitative terms and does not provide any insight into country-specific climate change media discourses. Another study has been conducted by Nofri (2013) who has analyzed cultures of environmental communication across four European countries, comprising Italy and Germany. The author treated climate change as a sub-theme for environmental themes in general using quantitative and qualitative techniques for assessing differences and similarities among the studied cases. The empirical part of the study, however, covers only the year 2006. Generally, and while there are several examples of comparative research that addresses the German print media,[24] the Italian context has been, so far, fairly underrepresented in cross-national comparative research on climate change communication.

Apart from the original contribution this study tries to make by comparatively analyzing Italy and Germany with regards to climate change communication, the choice to study these two countries was furthermore influenced by a number of methodological considerations and structural factors:

Analyzing two European countries that are part of the European Union holds considerable advantages with respect to the comparative design of this study. In previous decades the environment has certainly become a core area of European politics (Knill & Liefferink, 2013). Furthermore, the continuous expansion of environmental policy activities at EU level have deeply affected national policies and EU citizens across member states (Fischer, 2009; Knill & Liefferink, 2007), leading to a considerable degree of convergence (Nofri, 2013; Fischer, 2009).

With regards to climate change, the EU is not only the world's third largest emitter of greenhouse gases (European Commission, 25 Nov 2015) but has also been found to be an important and ambitious actor in international change climate negotiations (Delreux, 2013), appearing with a common voice in the global arena of climate governance (Oberthür, Jørgensen, & Shahin, 2011). Not only has the EU pushed for far-reaching and legally binding targets under the multilateral UN framework, but has also been a forerunner with regards to its internal climate change policies, introducing instruments such as the worldwide first

[24] Amongst others Grundmann and Krishnamurthy (2010) and Schreurs et al. (2001).

supranational emissions trading system and adopting fairly ambitious and pioneering climate and energy policy packages[25] (Wurzel & Connelly, 2011; Brandi, 2012). Furthermore, while the EU has played a key role in building the "high ambition coalition" that has made a sizable contribution to the successful outcome of the COP21 negotiations in December 2015 (Hirsch, 2016), only nine months later the European Parliament has ratified the adopted Paris Agreement by a large majority, enabling thereby its entry into force.[26] This certainly hints at a rather determined, coordinated and committed approach to climate change governance within the EU.

Furthermore, decisions at EU level are taken by "negotiating nation-based interests and points of views" (Nofri, 2013, p. 135). This implicates that differently disposed EU states are directly involved in the policy process that leads to common regulations and directives. Thus, single EU member states are influential and affected stakeholders in a common political sphere evolving around different issues of public interest. This obviously also applies to climate change, as an issue that affects various dimensions of national and EU public policy. Thus, it can be assumed that national media discourses in EU member states reflect and discuss to a similar, but yet qualitatively and quantitatively varying degree EU policy discourses and certain aspects of climate change-related issues (Olausson, 2009; Nofri, 2013). As discussed earlier on, media systems are highly responsive to the political environment in which they operate, and in this context the "political realm of Europe" (Olausson, 2009, p. 421) seems to have become increasingly relevant. In sum then, it can be asserted that such a setting makes a comparison especially fruitful, not only because the study deals with two cases that are sufficiently similar for meaningful comparison (Przeworski & Teune, 1970; Mahoney & Rueschemeyer, 2003), but also because the common political sphere to which Italy and Germany belong is substantially influencing global climate change governance.

[25] In 2007 EU leaders adopted the "2020 climate & energy package" setting an EU-wide 20 % target for emissions reduction, for the use of renewable energies and the improvement of energy efficiency. In 2014 the EU adopted its successor, the "2030 climate & energy framework" in line with the EU's long term goals for a low carbon economy and energy system (European Commission, latest update 2017).

[26] The Paris Agreement will enter into force after at least 55 parties to the Convention, representing at least 55% of global emissions, have ratified the document. Through the EU ratification on 4 October 2016 the 55 % threshold has been crossed (UNFCCC, n.d.).

The decision to concentrate on Italy and Germany as two EU countries has also been influenced by the presence of significant structural differences and similarities which are likely to affect public discourses on climate change-related issues. Within the EU, both countries have a relatively prominent role. Not only because of their long-standing commitment to European integration as part of the "inner-six", the founding states of the EU, but also due to their respective size, being among the EU's largest member states, economically and in terms of population[27]. At the EU level country dimension translates, directly and indirectly, into political influence, in terms of voting strength in some of the EU core institutions, such as the Council of Ministers, in terms of seats in the European Parliament, and because they have a wider range of policy interest and political resources at hand (Buonanno & Nugent, 2013). Thus, Italy and Germany can be considered to both have a relatively strong weight within EU policy making processes.

Despite the fact that both countries have large economies, these are substantially different in structure, which in turn is largely reflected in their very different energy consumption and emission levels. Germany's economy is highly industrialized and largely depends on energy-intensive manufacturing processes with a relatively high share of coal and solid fossil fuels (OECD, 2012; RAP, 2015). In fact, Eurostat data confirms that in 2014 Germany was the EU's top emitter of greenhouse gases with a share of 21.9 % of the EU-28 total.[28] Italy's economy, instead, is largely driven by the manufacturing sector and made up of small to medium-sized firms with relatively low energy-intensity (OECD, 2013; Farnesina, 2007). Furthermore, in the wake of the economic recession, starting from 2008, Italy's energy demand dropped considerably (OECD, 2013). Unsurprisingly, in the aforementioned Eurostat statistics Italy ranked only fourth among EU emitters, after Germany, the UK and France.

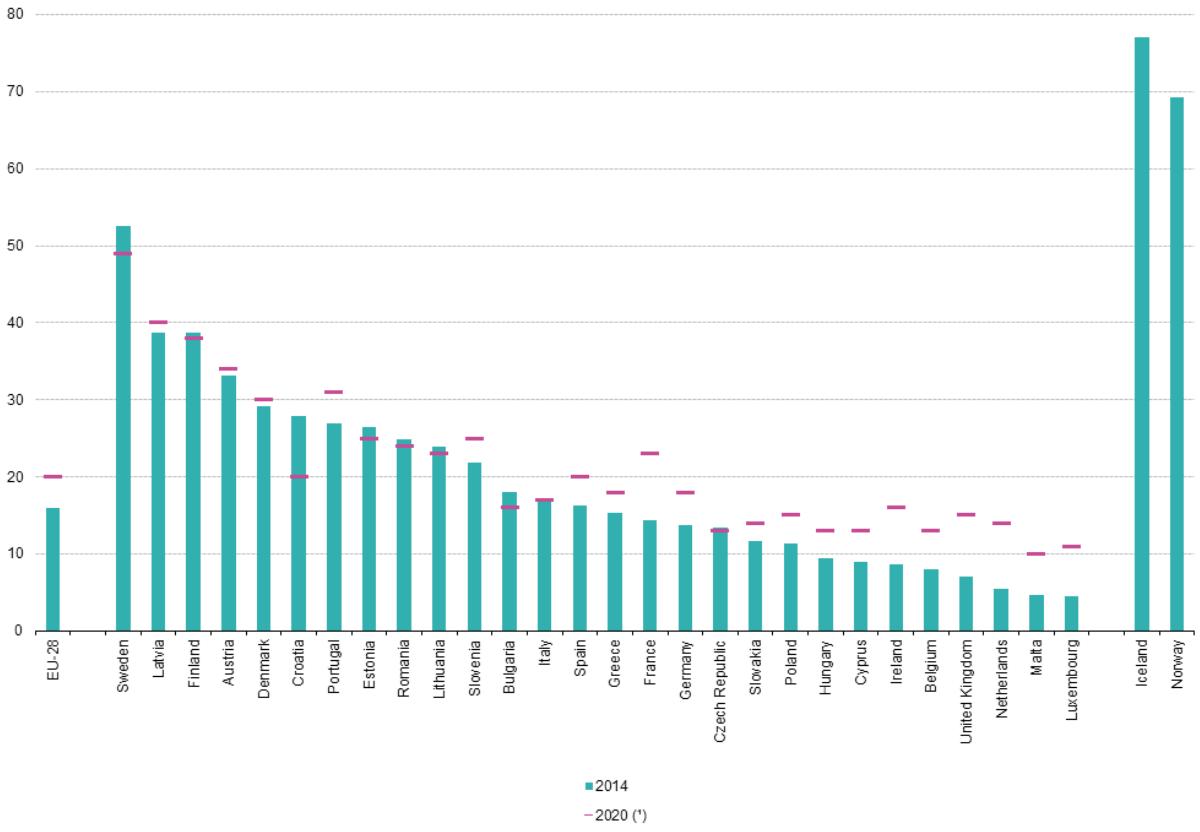
Despite such differences in emission levels, both countries are at the forefront of renewable energy production within the EU. In 2014 Germany was leading with an 18.4 % share of the total, followed by Italy (12.1 %) as the second largest producer of renewable energies. Notwithstanding the fact that the share of renewables in German power systems has steadily increased over the last 15 years (Agora Energiewende, 2014), Germany's energy mix is still rather carbon intensive (OECD, 2012). Furthermore, in recent years there seems to

[27] Measured by their respective gross domestic product (GDP), Germany is the EU's largest economy, while Italy comes fourth (Eurostat, latest update 2017).

[28] See European greenhouse gas emission statistics (Eurostat, June 2016).

have been a slowdown in the German *Energiewende* (Germanwatch, 2014; Balzer et al. 2015) while "CO2 emissions in the power sector have been on the rise since 2009" (Agora Energiewende, 2014, p.11). In fact, with a share of 13,8 % of renewable energies in gross final energy consumption Germany has still a long way to go in order to achieve its Europe 2020 target of 18 %. On the contrary, in 2014 Italy had already surpassed its 2020 target (see Figure 3). The transition to renewable energy sources can certainly be considered a crucially important step for climate change mitigation and, in the long turn, towards a green economy. In this regard, both Italy and Germany seem to be rather exemplary and largely on the "right track". Certainly, high levels of energy dependency in both countries and the economic downturn starting in 2008 have most likely played a significant role in obtaining such positive results.

Figure 3. Share of renewables in gross final energy consumption, 2014 and 2020 (%)[29]



[29] Source: Eurostat (2016, July).

Germany has often been characterized as a "front-runner in developing solutions to address the challenge of climate change" (OECD, 2012, p. 110), setting rather ambitious emissions reduction targets, going beyond what has been set out by the EU framework, and deploying "innovative policy measures and technologies to mitigate domestic greenhouse gas (GHG) emissions" (*ibid*.). It has been argued that the German approach to climate protection and renewable energies has been built on a broad societal consensus within civil society and across political parties and administrative levels, contributing to a rather smooth-running domestic policy process (OECD, 2012; Weidner & Mez, 2008; Uekötter, 2014). In this regard, it has also been pointed to the grassroots origins of the German energy transition, closely linked to the 1970s anti-nuclear movement, that has been instrumental in triggering and facilitating technological change (Hager, 2016). Thus, the renewable energy development in Germany was in large part a "bottom-up phenomenon" (*ibid*. p. 2), laying the "ground for later decisions taken by governments at the municipal, state, and federal levels (Stefes, 2016, p. 186).

In this context, the rise and advancement of the German green party, Bündnis 90/Die Grünen[30] has certainly been central to the steady institutionalization of green interests, creating favorable conditions for ambitious climate policies (Weidner & Mez, 2008). Since some time now, Germany has been enjoying the reputation as "green nation", not only for its green party as one of the strongest in Europe, for the high priority of environmental issues in national politics as well as among the general public, but also for its leading role in international climate change negotiations (OECD, 2012; Weidner & Mez, 2008; Andresen & Agrawala, 2002; Weidner & Mez, 2008; Uekötter, 2014; Stefes, 2016).

By contrast, Italy's response to the challenge of climate change and its environmental performance in general have been evaluated as less "virtuous" over previous decades. The 2013 OECD Environmental Performance Review for Italy argues that despite "many positive initiatives, particularly in some regions and business sectors" (p. 13), it has been fairly "difficult to scale up" positive results due to the "relatively low priority assigned to the

[30] The German green party, which had emerged as a fusion of different strands of the German environmental movement, entered the national parliament for the first time in 1983 and has twice joined the federal government, from 1998 to 2002 and from 2002 to 2005. Since 2005 Bündnis 90/Die Grünen is again part of the opposition. In 2013 federal elections the party was fourth strongest party with 8,4 %. In the 2014 EP elections Bündnis 90/Die Grünen performed slightly better, as third strongest party with a share of 10.7 % (Bundestagswahlleiter, n.d.).

environment by national and some regional governments [...] coupled with a highly decentralized governance system" (*ibid*.). Generally, it has often been hinted at the uneven distribution of administrative capacities across regions that has hindered the successful implementation of policies and thus environmental governance as a whole (Dente & Lewanski, 2002; OECD, 2013).

Nonetheless, after years of continuous growth, Italy's greenhouse gas emissions have markedly declined since the mid-2000s[31]. Furthermore, Italy "is now reportedly among the leading countries in terms of investment, turnover and employment in the renewable energy sector" (OECD, 2013, p. 15). These advancements, as the OECD report further states, have "largely been developed in the framework of EU climate and energy policies" (p. 144) and other international commitments. In fact, with regards to environmental policies Italy has been defined as a "follower" rather than "leader" or "pusher", dealing with environmental issues mainly by adopting policy measures, as for instance through the implementation of EU policy packages (Nofri, 2013; Dente & Lewanski, 2002). Italy, together with some other southern European countries such as Greece, Portugal and Spain, has often been regarded as "notorious laggard" (Keating, 12 Dec 2014; Vogel, 2012). What is more, with regards to EU environmental infringement proceedings Italy, together with Spain, has been at the top of the league table for many years now (Braun, 2016), with the EU-wide highest number of infringement cases for most of the last decade, (Hedemann-Robinson, 2015; Braun, 2016; European Commission, latest update 2016).

Like in the rest of Europe, the green movement in Italy gradually gained political relevance in the course of the 1980s, albeit with a slight delay compared to other countries (Bompan, 2014). Although Italy's green party *Federazione dei Verdi*[32] could increase its political influence at the national level since the mid-1990s, in more recent years the party has largely disappeared from the scene (Cazzullo, 10 Jan 2013; Close & Delwit, 2016). In the latest European Parliament elections in 2014 no Italian MP entered the green political group

[31] See European greenhouse gas emission statistics (Eurostat, June 2016).

[32] *Federazione dei Verdi* (Federation of the Greens) established in 1990 through the union of *Federazione Nazionale delle Liste Verdi* (Federation of Green Lists) and the *Verdi Arcobaleno* (Rainbow Greens). With the center-left coalition (*L'Ulivo*) the party could enter the national government for the first time. Since the late 2000s the party's success has vanished considerably, having no representatives in the national parliament, since 2008, and in the European Parliament since 2009 (Barry & Frankland, 2014; Bompan, 2014; Close & Delwit, 2016; European Parliament, n.d.).

(The Greens/European Free Alliance), while, by contrast, 13 seats were taken by German MPs (European Parliament, n.d.).

With regards to climate change vulnerability, it becomes obvious that both Italy and Germany are, though to a different degree, among the European countries that are most susceptible to the negative consequences of climate change. According to the Global Climate Risk Index[33], an instrument developed to analyze to what extent countries have been affected by the impacts of extreme weather events (e.g., storms, floods, heat waves etc.), based on the number of personal injury and property damage in absolute and relative terms, Germany ranks "among the 20 countries world-wide most affected by weather related catastrophes in the past 20 years" (Kreft, Eckstein, Dorsch, & Fischer, 2015, p. 11) and has been the most effected country in Europe. Italy, instead, ranks slightly lower, being the fifth most affected country in Europe, after Germany, France and Portugal and Russia (p. 13). Looking at the potential impacts in physical, environmental, economic, social and cultural terms, at the degree of vulnerability resulting from these potential impacts and at the two countries' capacity to adapt to climate change, it becomes obvious that Italy, in comparison to Germany, is predicted to suffer to a much higher degree from the adverse impacts of climate change (see Figure 4).

In sum then, it can certainly be expected that in both countries climate change receives a certain amount of attention in public discourse and in the media, especially in view of the fact that both countries are members of the European Union, with comparatively strong political weight and environmental impact due to the size of their respective economies and overall emission levels. Yet, Italy and Germany considerably differ in a number of aspects: The structure of their economies, their energy consumption and emission levels, their vulnerability to climate change impacts, their overall environmental performance, the strengths and relevance of green interests at national level and the overall importance ascribed to environmental issues. It is therefore likely that public discourse in these countries is somehow affected by these structural differences, being centered around some aspects of climate change rather than others and evaluating and addressing the issue in considerably different terms.

[33] The Global Climate Risk Index is developed and compiled by the NGO Germanwatch and the insurance company Munich Re.

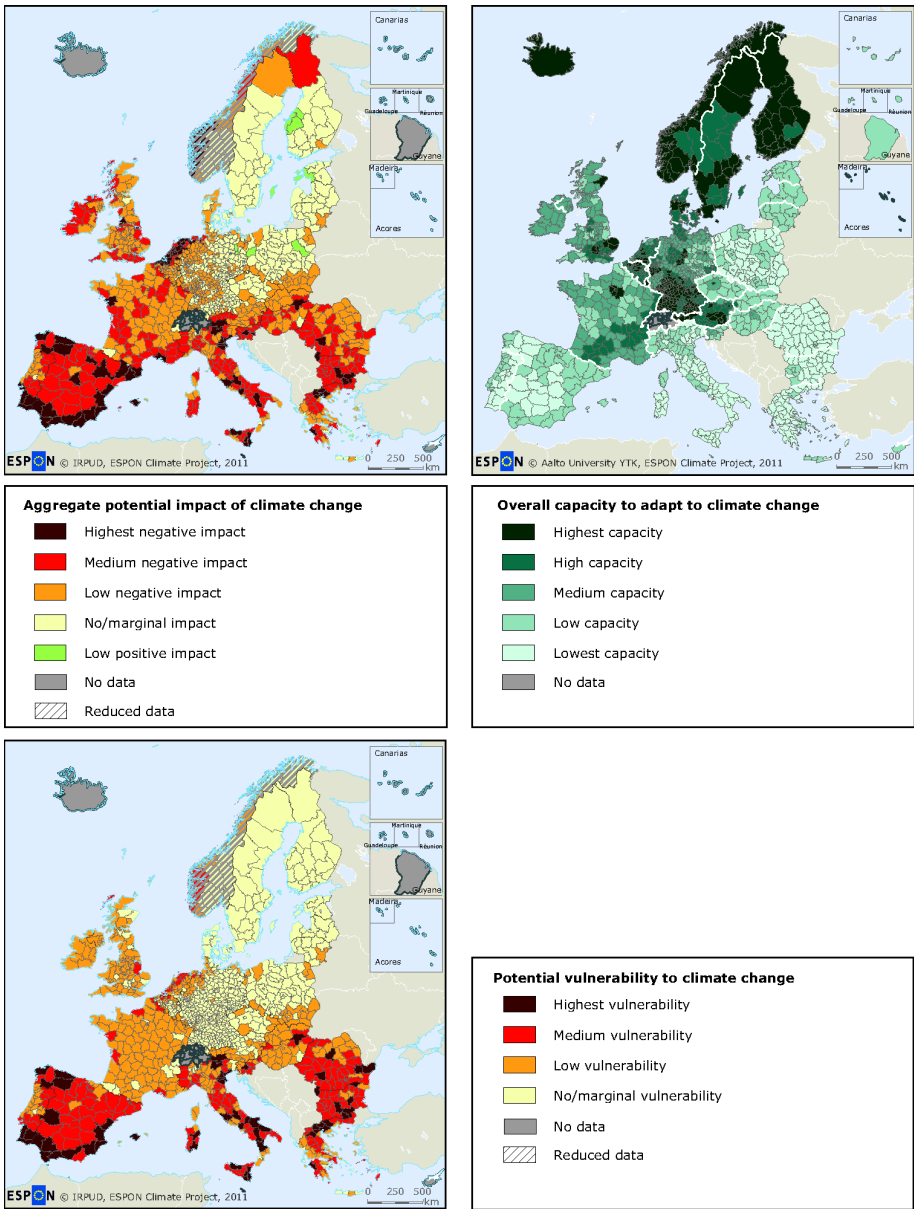


Figure 4. Overall impacts derived from 26 impact indicators, overall adaptive capacity from 15 individual indicators, and overall vulnerability from a combination of overall impacts and adaptive capacity[34]

Certainly and in line with what has been discussed in the previous chapter, reporting on climate change and its effect on public opinion is also substantially influenced by differences in media systems and journalistic cultures, as well as by the role newspapers play in different national contexts. Although their relevance as a source of information has constantly decreased over recent years, daily newspapers have a long-standing tradition in Germany and they continue to be read by various segments of the population (Nofri, 2013).[35]In Italy, on the other side, daily newspapers "have always tended to be an elitarian product" (*ibid*. p. 90), while the proportion of television viewers is especially high, compared

34 Source: Technische Universität Dortmund, Institute of Spatial Planning IRPUDR (2012).

35 See also Eurostat data on Europeans' cultural participation: Eurostat (2016, April).

to the share of newspaper readers (for a comparison of newspaper consumption in Italy and Germany see Table 3). These findings suggest that newspapers have, overall, more relevance within the German public sphere.

Table 3. Average daily minutes of newspaper consumption per individual in Italy and Germany[36]

	Italy	Germany
2010	10.0	23.0
2011	9.0	23.0
2012	9.0	23.0
2013	13.0	23.0
2014	13.0	23.0
2015	12.0	22.0

Both countries also seem to differ significantly with regards to their national media's approach to environmental communication. Analyzing the coverage of environmental issues in the two major national daily newspaper in each of the two countries, Nofri (2013) could show that Italian newspapers seem to have, on the whole, a rather "*humanistic*" (*ibid*. p. 333)[37] approach to the environment, granting much space to the social and political aspects of environmental issues, with a comparatively strong focus on local and civil society actors (Nofri, 2013).[38] German newspapers, instead, have been found to considerably privilege science themes and actors, as well as the mentioning of international bodies when reporting on the environment (*ibid.*). Be that as it may, the afore-cited author also emphasizes that

[36] Source: Own elaboration based on data from Eurisko Media Monitor, Auditel, Eurisko Sinottica, Audiweb, ZenithOptimedia forecasts, Statista, AGF, mediendaten.de, ma 2014 Radio II, ARD ZDF Onlinestudie, ZenithOptimedia forecasts Ind. age 14+. Data cited in Austin, Barnard, & Hutcheon (2015).

[37] Nofri (2013) here quotes the environmental journalist Antonio Cianciullo (*La Repubblica*) whom she personally interviewed for her study.

[38] Beltrame, Bucchi and Mattè (2012) had similar findings with regards to climate change communication in Italian media between 2004 and 2007.

"Cultures of Communication" (p. 106) are not only based on differences in media systems and journalistic culture but also on linguistic differences (*ibid*.). My individual language abilities have therefore been another substantial criterion for choosing Italy and Germany as cases for this study.

6 Public perception of climate change in Italy and Germany

As pointed out earlier, in the early 1980s climate change slowly started to become an issue of wider public interest and people increasingly "suspected that they ought to be concerned about the greenhouse effect" (Weart, 2003, p. 113). The emergence of climate change items in public opinion polls certainly reflected such heightened concern and the issue's growing importance in public discourse (Bord et al. 1998). In fact, it was around that time when climate change premiered in the Eurobarometer (EB), an EU-wide survey conducted on behalf of the European Commission since 1973.[39] Earlier EB surveys during the 1970s had already brought up the question of renewable energies and issues related to atmospheric science, such as forecasting and weather control;[40] their mentioning, however, was not directly linked to climate change, but was most probably related to the pressing issues of the time, like the energy crisis and weather-related food shortages (see Chapter 2). Be that as it may, it was only in the 1982 Special EB on "Europeans and their Environment" when EU citizens were asked for the first time about their sensitivity to the "[r]isk of changes in the earth's climate due to carbon dioxide" (EOS, 1982, p. 21).

The above-mentioned Special EB was the first of a series of surveys, conducted in the following decades up until now, and dealing with Europeans' attitudes towards a number of environmental problems at national and global level.[41] In 2008 the EU started to commission surveys which exclusively deal with climate change, while also the biannually published Standard EB, has been featuring survey questions on climate change since some time now. Certainly, the evolution of climate change as a survey item within the European opinion poll system perfectly reflects the ever rising salience of the issue on the European public agenda.

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[39] The Eurobarometer survey series assesses Europeans' attitudes towards the European Union and towards a variety of other issues, such as personal habits, values and attitudes and concerns about specific social, political and environmental problems.

[40] See for instance Special Eurobarometer on "Science and European Public Opinion" (EOS, 1977).

[41] The idea to conduct the survey directly "sprang from the observation that much national research in recent years-notably in France, Germany, Japan and the USA-had clearly shown a high degree of public concern about this subject" (EOS, 1982, Introduction).

Despite the wide-spread usage of and reference to EB surveys in "discourse and studies on opinion trends and European values" (Aldrin, 2015, p. 19), the data generated within the EB survey framework must probably be used with some reservation. As discussed in Chapter 3, the EB's suitability for longitudinal comparison is generally limited due to the variability of the questions' format over the years. Furthermore, the EB instrument has been frequently criticized for its many biases in terms of answer generation, data interpretation and presentation (Aldrin, 2011) as well as for its highly political character with a tendency to "artificially manufacture" (*ibid*. p. 14) European public opinion on certain issues (Höpner & Jurczyk, 2015). It must be also kept in mind that questions about environmental issues are likely to "generate socially desirable responses" (Bord et al. 1998, p. 76). Be that as it may, and despite such considerable weaknesses, for the purpose of this study and for tracking broad developments of public opinion on climate change in two different European countries (in the case of the present study, Italy and Germany) the Eurobarometer is certainly a convenient instrument and allows for a direct comparison.

Unsurprisingly, in 1982 concern about CO2-induced climate change ranked at the bottom compared to other global environmental problems, such as forest depletion and species extinction. However, respondents from, at that time, ten EU member states, were on the whole considerably more concerned about climate change than about a number of environmental problems at the local level. These results suggest that among Europeans there was already a high degree of awareness, sensitivity and concern about the possible deterioration of the global environment, including climate change. Looking at national differences, it can be ascertained that Italian and German respondents were among the most concerned about the national and global environment. This also seems to hold true for levels of concern about global climate change, with Germany and Italy (together with Denmark) definitely ahead of the rest (see Figure 5).

As the Special EB report reveals, concern for the national and global environment was "determined principally by the respondent's system of values and political tendency" (EOS, 1982, p. 32) and those respondents considered "post-materialists" with a left-leaning political orientation were, on the whole, the most likely to be concerned (*ibid*. p. 28). Hence, the data seems to suggest that post-materialistic values, generally associated with heightened concern for the environment (see Chapter 3), were at that time relatively

pronounced among Germans and Italians. Furthermore, the fact that German and Italian respondents' tendency to view environmental protection as a priority was not contingent upon regional characteristics such as economic development, also points in this direction. Interestingly, at the local level respondents in Italy and Germany seemed to be among the least satisfied with their immediate environment "with regard to almost all the items surveyed" (*ibid*. p. 8) and independent of regional differences in population density. In fact, the report concluded that "Germans and Italians appear particularly sensitive to nuisance at local level" (*ibid*. Synopsis).

Figure 5. Sensitivity of Europeans to environmental problems at national and global levels, by country[42]

	Sensitivity index, Community	B	DK	D	F	IRL	I	L	NL	UK	GR
Damage to sea life and beaches	2.21	1.81	2.17	2.25	2.24	1.91	2.21	2.13	[2.38]	2.19	2.20
Industrial chemical waste	2.18	1.88	2.11	2.25	2.14	1.95	2.15	2.03	[2.45]	2.16	2.33
Nuclear waste	2.16	1.96	2.16	2.16	2.17	1.97	2.07	2.05	[2.40]	2.23	2.06
Pollution from other countries[2]	2.06	1.72	2.03	2.19	2.02	1.84	1.95	1.94	[2.49]	2.02	1.93
Pollution of rivers and lakes	2.02	1.70	1.95	2.20	1.97	1.85	2.17	1.86	[2.25]	1.76	1.86
Depletion of the world's forest resources	2.02	1.89	2.16	1.99	1.95	1.61	2.15	[2.39]	1.95	2.03	1.94
Extinction of certain animal species	2.01	1.76	2.05	2.18	1.92	1.60	1.98	[2.23]	2.12	2.01	1.81
Air pollution	1.96	1.78	1.83	2.15	1.87	1.67	[2.19]	1.99	2.11	1.59	[2.19]
Risk of changes in the earth's climate due to carbon dioxide	1.86	1.64	[2.03]	[2.06]	1.67	1.67	[2.03]	1.81	1.68	1.74	1.83
AVERAGE INDEX	2.05	1.79	2.05	2.16	2.00	1.79	2.10	2.05	[2.21]	1.97	2.02
ORDER OF COUNTRIES	-	9	4	2	7	9	3	4	1	8	6

Six years later in 1988, the year when climate change was definitely pushed into the international spotlight, an extended version of the same survey was conducted. Though many new questions had been added, the 1988 Special EB on Europeans' attitudes towards the environment still contained many questions that were almost identical to the previous

42 Source: Eurobarometer (EOS, 1982, p. 21).

editions. Without a doubt, the results are perfectly in line with the growing prominence of climate change in public discourse during the 1980s: While in 1982 climate change ranked at the bottom, it had definitely gained importance over the previous six years, being the fifth most worried about environmental threat on a list of seven, ranking before natural resource depletion and damage to sea life and beaches (EOS, 1988). As in 1982 respondents from Italy, Germany and the Netherlands were among the most concerned about their country's and about the global environment. Germany had fallen back on rank four, while Italy had become the second most concerned country, after the newcomer Spain who had joined the EU only two years earlier. With regards to climate change, Italian and German respondents were again among the most concerned (rank three and four respectively). Interestingly, with the accession of two new southern European member states (Portugal and Spain) a rather pronounced North-South divide had become evident, especially concerning the respondents' satisfaction with the quality of their immediate environment and the actions taken by national authorities (*ibid*.). This seems to hint at considerable differences with respect to environmental governance across EU member states and would be partly in line with what has been set out in the previous chapter concerning Italy and Germany. It must be noted though that in 1992, and when compared to Italian respondents, Germans were on average only minimally more satisfied with their local environment and with the efficiency of public bodies (see INRA, 1992). These results seemed to have been strongly influenced by the fairly high levels of dissatisfaction among respondents from the eastern German ex-GDR regions, who had only recently become EU citizens.

In 1992 the global environment certainly played a fairly prominent role in the public sphere. This was in large part due to the United Nations Conference on Environment and Development (also known as the Rio Earth Summit) which was able focus international attention on global environmental problems and the concept of sustainable development (Osborn & Bigg, 1998). The Summit resulted in a number of ambitious international treaties, amongst which the U.N. Framework Convention on Climate Change, certainly a milestone for global climate governance. The Special EB "Europeans and the Environment in 1992" largely reflected this mood of concern over the environment that in many EU countries had significantly increased since 1988. Furthermore, climate change had risen to unprecedented prominence, which already becomes obvious when taking a look at the question wording.

While in the previous surveys climate change still had been a somehow "exotic" concept that required further explanation, in 1992 "global warming" had basically become a "household term" (Ungar, 1992, p. 488) that most people could readily recognize.[43] When confronted with a list of different threats to the global environment, 89 % of Europeans claimed to be "somewhat worried" or "very worried" about global warming. Unsurprisingly, concern for ozone depletion was in terms of "very worried"-answers the strongest with 69 %, and ranked, on the whole, slightly higher than climate change, with a share of 92 %.[44] These results seem to be fairly in line with findings from in-depth studies on individuals' perception and understanding of climate change that were conducted at about the same time. As discussed in Chapter 3, the ozone hole as a concept was much more consolidated and accessible to most people, although few correctly understood the issue from a scientific point of view. In fact, when climate change entered the scene it was "often categorized as a subset of stratospheric ozone depletion" (Capstick et al. 2015, p. 38). German and Italian respondents expressed the highest levels of concern (with an equal score[45]) together with Portugal, Spain and Luxembourg, though slightly less than Greek respondents who proved to be the most concerned.

When looking at the respondents' environmentally friendly behavior, in terms of actions they had already taken, it becomes obvious that there was a rather significant quantitative gap between "everyday behavior", such as avoiding to drop waste on the ground, tap water saving and waste recycling, and more demanding action, such as limiting car use, equipping one's care with a catalytic convenor or participation in environmental activism. While these results seem to strongly confirm the findings from research on environmental behavior (see Chapter 3), it also becomes obvious that, in comparison to Italian respondents, Germans were considerably more likely to take actions aimed at reducing emissions (driving less, customize one's car), certainly those actions that are most significant for tackling climate

[43] In 1988 respondents were asked whether they were worried about "possible atmosphere damages affecting the world's weather brought about by the gas (carbon dioxyde) emitted from burning coal and oil products" (INRA, 1992).

[44] Share of respondents from the twelve member states who claimed to be very or somewhat worried.

[45] Scores of concern were "calculated by applying the coefficients 4, 3, 2, and 1 to responses 'very worried', 'somewhat worried', 'not very worried' and 'not at all worried' respectively" (INRA, 1992, p. 38).

change. Concerning everyday-actions and environmental activism instead, there were only minimal differences between the two, with German respondents only slightly ahead.[46]

As discussed earlier, the EB data suggest that there had been an overall decline in concern between the mid-1990s and the early 2000s. In fact, while concern about global warming in terms of "very/quite worried"-responses had dropped from 89 % (with 62 % declaring to be "very worried") in 1992 to 84 % in 1995 (INRA, 1995), in 2002 the share of Europeans who claimed to be "very worried" was at only 39 % (EORG, 2002).

As it had already emerged from earlier Special EBs on Europeans' environmental attitudes, southern European member states not only seemed to be less satisfied with the quality of their local environment, compared to many northern European countries, but also more concerned about global environmental issues such as climate change. This seems to be particularly striking since environmental movements originally arose in the "industrialised countries of northern Europe" (*ibid*. p. 12). The 2002 Special EB report suggests that rising living standards in the South might have coincided with environmental degradation and thus a "fall in quality of life" (p.12), leading to growing environmental awareness and concern. Taking into account findings from risk perception research (see Chapter 3), it might also be assumed that such high levels of concern are somehow related to the rather strong distrust in public institutions that, as the EB survey could show, was especially pronounced in southern European countries (p. 28). However, it is interesting to note that with respect to sources of environmental information, Germans, as compared to Italian respondents, generally seemed to have considerably less trust in national and regional governments.

While climate change had obviously lost some of its urgency by the early 2000s, only five years later in 2007, the issue had become the number one environmental threat among Europeans, with 57 % mentioning it among their top five environmental concerns (TNS, 2008). This development certainly reflects the drastic increase in public attention to climate change and related issues during the mid-2000s (see Chapter 4). On top of that, with climate change suddenly "all over the place", the issue had become the second most mentioned topic when respondents were asked to give their first direct association with the word “environment” (*ibid*. p. 5).

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[46] With regards to "low-cost"-action, differences between member states were in general considerably less significant.

Both among Italian and German respondents, climate change was the environmental problem most often mentioned when confronted with a list of items, though on the whole, Germans were fairly more likely to do so (the share of Italian respondents mentioning climate change was 10 % below EU27 average). With respect to Europeans' believes about who should be held "primarily responsible for responding to environmental challenges" (*ibid.* p. 16) some interesting differences can be observed. While in all countries the majority of respondents claimed that both the "big polluters" and individuals were responsible, Germany was among those member states in which slightly more people believed that individuals are primarily responsible. In Italy considerably more people believed the opposite. Against the background of what has been said in the previous chapters about people's perception of individual and collective agency and structural barriers to pro-environmental behavior, these results seem to hint at a higher degree of perceived individual efficacy among German respondents.[47]

COUNTRIES	The environment is an issue beyond my control as an individual	My actions can make a real difference to the environment	None of these (SPONTANEOUS°	DK
B	30	52	11	7
DK	42	51	4	3
D WEST	35	56	4	5
D TOTAL	36	56	4	5
D OST	38	54	5	3
GR	56	36	4	4
E	30	39	15	15
F	58	30	9	3
IRL	37	45	6	12
I	50	36	9	6
L	33	54	12	1
NL	39	51	7	3
A	33	52	9	6
P	34	45	9	13
FIN	26	66	5	3
S	26	63	5	6
UK TOTAL	48	39	7	6
EU15	43	43	8	6

Figure 6. Individual actions: Which of these opinions comes closest to yours? - One answer only[48]

[47] With regards to the individual factors that influence respondents' perception of the responsibility for environmental protection, the Special EB 2008 points out that so-called "environmental pragmatists are more likely to agree that individuals can play a role in protecting the environment" (TNS, 2008, p. 19).

48 Source: Eurobarometer (EORG, 2002, p. 22).

Similar findings had emerged from the 2002 Special EB (see Figure 6), showing that among Italian respondents a feeling of personal powerlessness with regards to environmental protection seemed to prevail, while German respondents were pronouncedly confident (56 %) that their individual actions could make a "real difference" (EORG, 2002, p. 22).

Most probably as a result of the strongly increasing societal discussion about climate change, in 2008 the European Commission mandated for the first time an EB survey specially on climate change. Interestingly, while in 2002 Italians were more concerned about climate change than Germans, in 2007 and 2008 this trend seemed to have been reversed (see Figure 7). While 71 % of German respondents believed climate change was the most serious problem facing the world, among Italian respondents only 47 % were of that opinion. Such a turnaround of trends might be explained by the growing relevance of climate change in the wake of the German *Energiewende*, significantly accelerated during the early 2000s with the adoption of important energy-related policy acts, and by the conservative–social democratic coalition (that came into power in 2005) making climate policies a "top priority" (Weidner & Mez, 2008, p. 356).

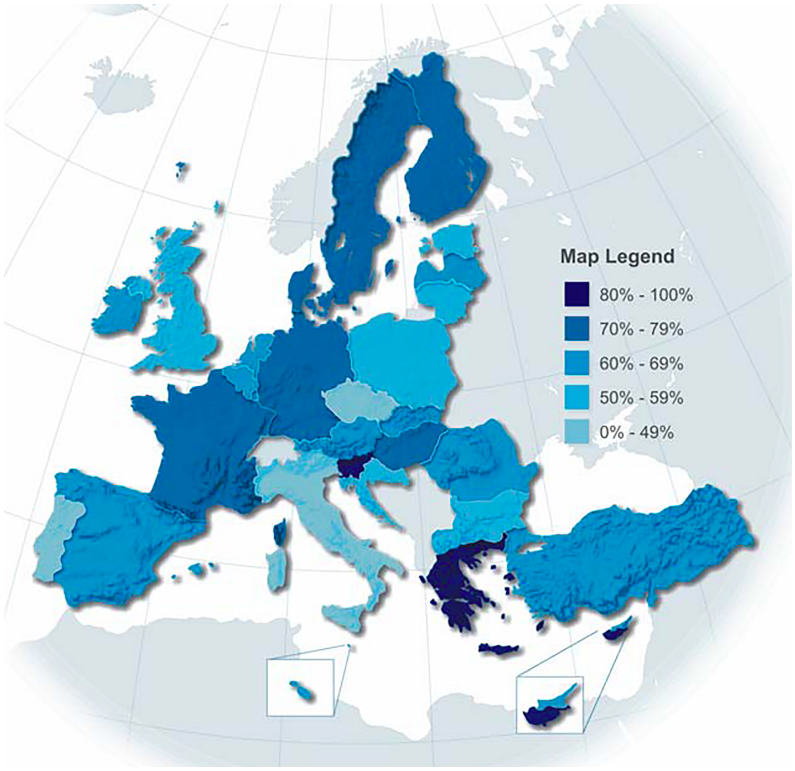


Figure 7. Share of respondents who consider climate change to be the most serious problem currently facing the world as a whole[49]

[49] Source: Eurobarometer (TNS, 2008, p. 7).

This might also explain the significant differences in levels of information: While German respondents seemed to consider themselves, on the whole, rather well informed on the causes, consequences and ways of fighting climate change (on average 63 % felt well informed about these issues), among Italians the share of well-informed respondents was about 20 % lower, with a significantly higher percentage of "don't know"-answers. With regards to the question whether survey participants "personally have taken actions aimed at helping to fight climate change" (TNS, 2008, p. 26) a similar picture emerges: Among Italian respondents 13 % replied that they actually did not know whether they had taken action (among German respondents the share was at 4 %). High levels of concern and information among German respondents were also reflected in the types of action these claimed to have taken in order to tackle climate change. With regards to avoiding short flights, purchasing eco-friendly cars or generally reducing car use, German respondents were markedly more likely than the EU average to have taken these actions. Italian respondents were in this respect slightly below the average.

All in all, these numbers seem to suggest that in 2008 climate change enjoyed rather high salience among German respondents, who expressed a high degree of sensitivity, concern and self-perceived knowledge, while Italian respondents seemed to be less alarmed and considerably less informed. What is more, these findings seem to be in line with what has been discussed in the previous chapter concerning Italy's rather slow response to the challenge of climate change and the low political priority that has been ascribed to the issue over most of the last decade (OECD, 2013). It is certainly quite likely that these factors have affected public discourse, people's perception and the overall importance ascribed to the issue, especially in view of more immediate problems.[50] In fact, data from the 2007 Special EB on environmental attitudes suggests that Italians seemed to focus their attention on other environmental issues, most prominently on the problem of pollution in towns and cities.[5] Especially with regards to the enormous waste management problems related to organized crime, mostly in Southern Italy (Nofri, 2013; Germani, Pergolizzi, & Reganati, 2015), and

[50] Nofri (2013) could show that in 2006 environmental communication in the two Italian major daily newspapers strongly focused on waste management and pollution in general.

[51] When asked in 2007 what was their first association with the word “environment”, choosing from a list of different items, 36 % (the highest percentage for this item compared with the rest of the EU) of Italian respondents replied "pollution in towns and cities" (only 9 % replied "climate change").

the fact that by 2013 "more than half the 30 most polluted cities in Europe" (OECD, 2013, p. 13) were in Italy, these findings are not overly surprising.

When looking at Italian and German respondents' reasons for having taken action to fight climate change, it becomes obvious that these diverge considerably. While the majority of Italians claimed that they had taken action because they thought that "if everybody changed their behaviour, it will have a real impact" (TNS, 2008, p. 73), German respondents were more likely to reply that they thought that it was their "duty as a citizen to protect the environment" (*ibid*.). These responses seem to indicate fairly pronounced differences in the respondents' self-concept as citizens, in their perception of self-efficacy and their levels of trust in others, which might hint at somewhat differently natured civic cultures in these two national contexts.

When Europeans were questioned about their attitudes about climate change in 2011, the economic crisis had undoubtedly made itself felt within the EU which is largely reflected in the data. In Italy climate change, as the "single most serious problem facing the world" (TNS, 2011, p. 11), ranked quite below EU average[52], while concern over the economic situation was much stronger. German respondents, instead, seemed to be much more worried about climate change (with 66 %). What is more, again Italian respondents, as compared to German respondents, proved to be fairly concerned about the problem of pollution in towns and cities. With regards to the responsibility for fighting climate change, EU citizens, as a whole, were most likely to point to national governments. German respondents most often held business and industries responsible, whereas Italians most often opted for the collective responsibility of all actors. Concerning the share of respondents who believed that they "personally" (*ibid*. p. 20) were responsible, a rather significant gap leaps to the eye: 36 % of German respondents believed that they personally were responsible for tackling climate change, while among Italian respondents the share was only 5 %, the second lowest in the EU. In connection with the afore-mentioned high levels of perceived informedness among German respondents and the high share of those who had taken action, these findings seem to be in line with what has been discussed in Chapter 3 concerning the correlation between environmental sensibility and responsibility attribution.

[52] 51 % of EU citizens believed that climate change was the single most serious problem facing the world.

Although a major climate change-related event, the COP21[53], was scheduled for December 2015, in late spring of that same year most EU citizens seemed to consider issues, such as poverty, terrorism and the economic situation as more pressing than climate change. In fact, the issue had fallen from ranking the second most serious issue (as perceived by EU citizens) in 2011 to ranking only fourth in 2015. In view of the migrant crisis and the terrorist attacks in Paris earlier that year, these results are certainly not very surprising. What is more, these findings seem to reflect the general downwards trend in public concern starting in the late 2000s (see Chapter 3). Since 2008 the share of EU citizens who claimed that climate change was the "single most serious problem facing the world" had considerably declined. Also in 2015 German respondents were more likely than Italian respondents to consider climate change to be the most serious problem facing the world. Despite these continuing differences, the majority of Germans and Italians have been of the opinion that climate change is a very serious problem.[54]

Table 4. Average rating for the perceived seriousness of climate change on a scale from 1 to 10, with 10 signifying "an extremely serious problem"[55]

	Italy	Germany	EU average
2009	7.2	7.3	7.1
2011	7.8	7.3	7.4
2013	8.2	7.6	7.3
2015	7.9	7.5	7.3

What is more, since 2008 the perceived seriousness of the issue has been on the rise among Italian respondents, interestingly with ratings noticeably higher than those of German respondents (see Table 4). This seems to hint at the fact that Italian respondents have increasingly felt that climate change is a very serious issue (well above EU average), but that

[53] Conference of the parties to the United Nations Framework Convention on Climate Change.

[54] In all survey waves respondents were asked how serious a problem they thought climate change was at the moment, having the option to answer with a "very serious problem", a "fairly serious problem" and "not a serious problem".

[55] Source: Own elaboration based on data from TNS (2009), TNS (2011), TNS (2013), TNS (2015).

they ultimately, when confronted with a list of different items, give priority to more immediately pressing concerns. Furthermore, Italians seem to have become increasingly confident about their ability to play a role in protecting the environment.[56]

The 2015 Special EB on climate change reveals that Italian respondents might not connect their everyday environmentally friendly behavior with climate change. In fact, there was a rather pronounced gap between respondents who claimed to have taken action over the past six months (34 %) and the share of people who had actually taken action (91 %).[57] These findings seem to indicate that in 2015 the overall level of informedness on the specific ways to tackle climate change was still relatively low. Although Germans are among those respondents that were more likely to claim that they had taken action (66 %), there was a comparatively high share of respondents who said that they did not know (9 %). This seems to indicate that also among German respondents there was obviously still a significant lack of information on specific measures to fight climate change.

Looking into the ways public opinion on climate change in Italy and Germany has developed over time (as measured by the Eurobarometer), the following main points have emerged:

- In the **early 1980s** both Italy and Germany were the EU countries with the highest levels of environmental awareness and concern (after the Netherlands).
- Towards the **late 1980s** Italy superseded Germany with regards to levels of concern over the global environment, being at the forefront with EU newcomer Spain. A North-South divide regarding respondents' satisfaction with their countries' environmental performances had become evident.
- In **1992** Italian and German respondents seemed to be equally concerned about climate change, though Germans were more likely to have personally taken measures aimed at reducing emissions (e.g. driving less, customize one's car).
- In **2002**, as in previous editions of the EB, the North-South gap persisted. Southern European member states like Italy were, on the whole, fairly more concerned about climate change.
- By the **mid to late 2000s** this trend had been reversed. German respondents, as compared to Italians, were then considerably more concerned about climate change, felt better informed, and were more likely to have taken action to tackle the problem.

[56] In 2014, 86 % of Italians totally agreed that they as individuals could play a role in protecting the environment, compared to 89 % of Germans who were of that opinion (TNS, 2014).

[57] After being asked whether they had taken any action to fight climate change, respondents were presented with a list of specific items, such as waste recycling, buying locally produced seasonal food etc. The share of Italian respondents who had actually taken some kind of action rose to 91% (TNS, 2015, Country Highlights).

- In **2015** the differences between Italy and Germany were still evident and have basically persisted over recent years, although the seriousness ascribed to climate change by Italian respondents had overall increased. Especially in Italy actual knowledge about concrete ways to fight climate change still seemed to be limited.

In sum, then, it can be ascertained that since the early 1980s Italians and Germans have displayed a rather pronounced sensitivity towards climate change and environmental problems in general. In more recent years, climate change seems to have become more important within the German context while Italians seem to have given priority to other social, economic and environmental problems. Generally, Italian and German respondents seem to diverge in their self-conception as agents of environmental protection and in their perception of individual and collective responsibility. Among Italians there seems to be a persistently low degree of satisfaction with the environmental performance of citizens and public authorities and an overall less proactive stance to environmental protection, which can probably be seen as closely related to the diffuse lack of social and institutional trust within Italian political culture (see Nofri, 2013; Dente & Lewanski, 2002) and the, on the whole, relatively low priority of environmental issues on the political agenda in previous decades.[58]

[58] It has been pointed out that Silvio Berlusconi's *Forza Italia*, the political party that had been in power "for most years since the early 1990s" (Nofri, 2013, p. 57) up until the early 2010s, was the first to "hold an openly anti-environmental position" (Dente & Lewanski, 2002, p. 269) and who had overall, as argued by some authors, a rather negative impact on Italian environmental legislation (Benedetto, 2006).

7 Climate change media coverage in Italy and Germany

Building on what has been discussed in the previous chapters, the present section will try to empirically assess how much and in which way Italian and German newspapers have dealt with the issue of climate change over previous years. For this purpose, I have analyzed quantitative and qualitative patterns in climate change coverage in the two major daily quality newspapers in Italy, *Corriere della Sera* and *La Repubblica*, and in Germany, *Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung*.[59]

Table 5. Newspapers under study[60]

Country	Newspaper	Political orientation
Italy	*Corriere della Sera*	center/liberal/mildly conservative
	La Repubblica	center-left
Germany	*Frankfurter Allgemeine Zeitung*	center-right/liberal/moderately conservative
	Süddeutsche Zeitung	center-left/liberal

In the first part of this chapter, I will discuss how much and in which proportion the selected newspapers have reported on climate change in recent years, between 2010 and 2015, and over the medium-to long-term period from 1992 to 2012. Furthermore, the data has been compared according to country differences and according to the political orientation of the newspapers under study. In the second part, I will try to set out the different topics and themes that represent and characterize climate change coverage in both countries. What is more, I will discuss the specific actors that dominate the scene, identifying the particular

[59] Details on selection criteria are expressed in the Appendix, Chapter 10.

[60] Source: Modified from Nofri (2013) and Marx (2014). While generally the limitations of such "labels" must be kept in mind, this broad categorization is useful for comparing climate change coverage according to the ideological differences between the newspapers (here slightly left and slightly right of the center), in addition to the country-based comparison. For practical reasons and despite the fact that the differences are actually more nuanced, from here on only two distinct categories will be used for referring to the different papers: "center-left" and "center-right".

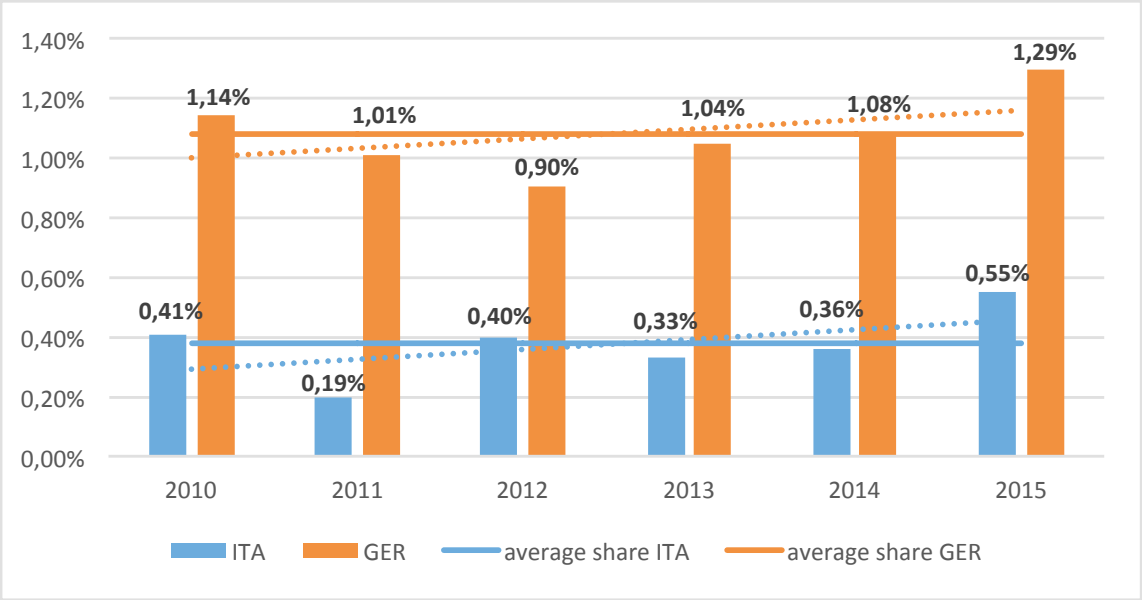
instances in which they appear, the roles that are ascribed to them, and the way climate change is generally addressed, in order to ultimately evaluate the articles' potential for triggering behavioral change.

7.1 How much do the media in Italy and Germany talk about climate change?

As discussed in the previous chapters, the amount of media coverage an issue receives can be considered a significant indicator for how much relevance is generally ascribed to it within a given context. In order to gain an understanding of how much news space climate change has received in the Italian and German press, I have calculated the share of climate change articles published in the four newspapers under study, containing at least one of the predefined keywords ("climate change", "greenhouse gas", "greenhouse effect", "global warming", "climate protection"), of the total amount of articles published over the same time period.

In order to determine whether country differences can be detected with regards to the amount and proportion of climate change coverage, the number of articles counted for the two newspapers representing each country have been summed and compared, as displayed in Figure 8. What clearly leaps to the eye is that in the two German newspapers the amount of climate change coverage is, with an average of 508,17 articles per year, considerably higher than in the two Italian papers (with an average of 188,67 articles). What is more, in the German papers the overall salience of climate change is, with an average share of 1,08 % of the total of articles published, significantly stronger than in Italy, where the average share is at only 0,37 %. On the whole, the data seems to strongly confirm what has been hypothesized in the earlier chapters with regards to the overall importance ascribed to climate change in both public spheres, with climate change as an issue having fairly more salience in Germany, especially since the mid-2000s.

Figure 8. Italy and Germany 2010-2015: Climate change articles, % of total (Italy: n= 319278; Germany: n=280157)[61]



Looking at the development of climate change coverage per country, it can be ascertained that, on the whole, in both Italy and Germany the proportion of climate change articles of the total of articles published increased between 2010 and 2015. In both countries the share of climate change coverage dropped in 2011, as compared to 2010, then steadily rose since 2013 and reached its most significant peak in 2015. Thus, broad climate change coverage patterns in Italy and Germany for the years 2010-2015 are almost identical and, furthermore, are fairly in line with worldwide coverage trends observed for the same time span. As discussed in Chapter 4, worldwide climate change coverage significantly dropped in the early 2010s, slowly started to recover in 2013 and significantly peaked in 2015. However, and despite their overall correspondence, in 2012 climate change coverage patterns observed for Italy and Germany significantly diverge: While in Germany the share of climate change articles continued to drop, in Italy it rose again on 2010 levels, then slightly dropped in 2013 before rising again. It is certainly interesting to note that Italian climate change coverage peaked when at the same time German coverage, in line with worldwide trends, reached its most significant low.

[61] Source: Own elaboration on articles from TIPS database and *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* online archives.

Generally, it can be ascertained that for all four newspapers surveyed the differences between the number of climate change articles published per year are statistically significant and that there is no uniform distribution of climate change articles over the years (see Table 6). The variance between the annual average values is especially significant for *La Repubblica* (F=18,097; p=0,000), followed by the *Frankfurter Allgemeine Zeitung* (F=14,208; p=0,000), while climate change coverage is, as compared to the former two papers, more evenly distributed in the *Süddeutsche Zeitung* (F=6,301; p=0,000), and most uniform in the *Corriere della Sera* (F=3,605; p=0,006).

Table 6. Number of climate change articles: Annual mean variance per newspaper (2010-2015)[62]

Newspaper	Annual mean variance (2010-2015)
Corriere della Sera	F=3,605; p=0,006
La Repubblica	F=18,097; p=0,000
Frankfurter Allgemeine Zeitung	F=14,208; p=0,000
Süddeutsche Zeitung	F=6,301; p=0,000

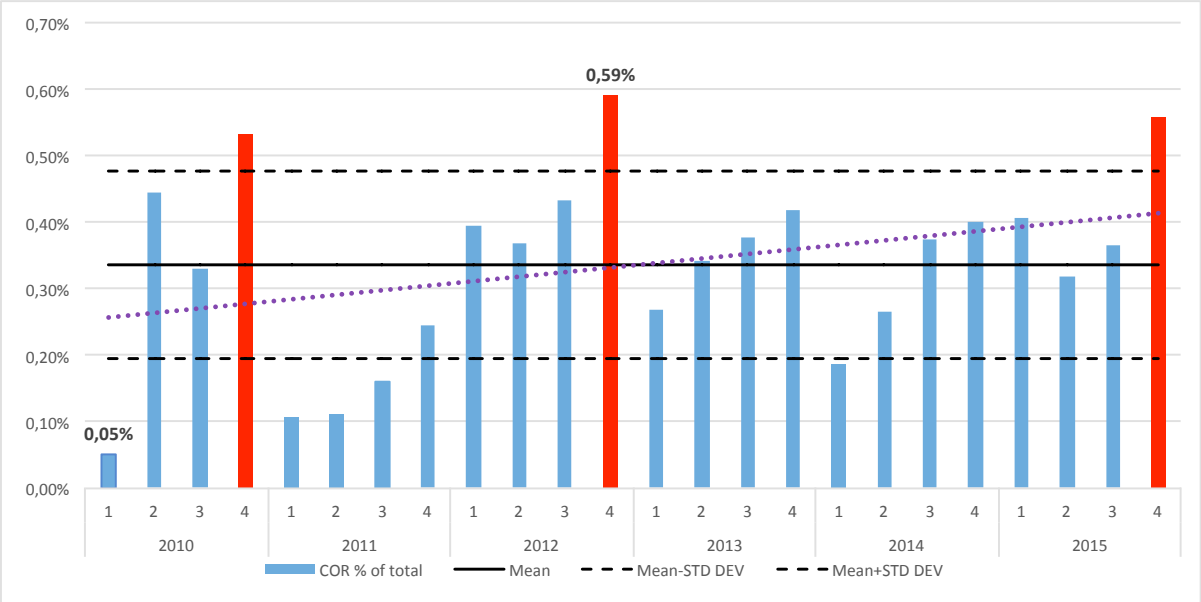
When comparing amount and proportion of climate change coverage in the four newspapers on the basis of their political orientation, it becomes evident that, generally, differences with regards to issue salience seem to be much more pronounced on the country-level. Calculating the quarterly average share of climate change articles for the six years under consideration (2010-2015) it can, in fact, be observed that there are no overly significant differences between the *Corriere della Sera* (21,54 articles: 0,34 % of the total) and *La Repubblica* (25,33 articles: 0,38 % of the total) in Italy, and the *Frankfurter Allgemeine Zeitung* (69,21 articles: 1,04 % of the total) and the *Süddeutsche Zeitung* (57,83 articles: 1,08 % of the total) in Germany. These findings seem to confirm Nofri (2013) who

[62] Source: Own elaboration on annual mean variance values calculated by Dr. Paolo Giardullo (PhD), based on articles from TIPS database and *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* online archives.

has found, against her initial hypothesis, that center-left papers report on environmental issues only slightly and, on the whole, rather insignificantly more than center-right papers.

As can be inferred from Figures 9-12, in all four newspapers the share of articles dealing with climate change rose over the period under study. The upwards trend is especially pronounced in the Italian center-left daily *La Repubblica* (Fig. 11), and least marked in the German center-left paper *Süddeutsche Zeitung* (Fig. 12), where almost no upward trend can be observed. This certainly reflects the fact that climate change coverage in *La Repubblica* was at the beginning of the period under study, in 2010, extremely volatile, with a share of 0 % of the total, thus significantly falling below the normal range of oscillation,[63] in the first as well as the third quarter of the year.

Figure 9. *Corriere della Sera* 2010-2015: Climate change articles, % of total (n=174810)[64]



[63] The range of normal oscillation comprises the mean value plus standard deviation and the mean value minus standard deviation, allowing for the distinction between those peaks and troughs that are within the normal value range and those that are more significant.

[64] Source: Own elaboration on articles from TIPS database.

Figure 10. ***Frankfurter Allgemeine Zeitung*** **2010-2015: Climate change articles, % of total (n=154996)[65]**

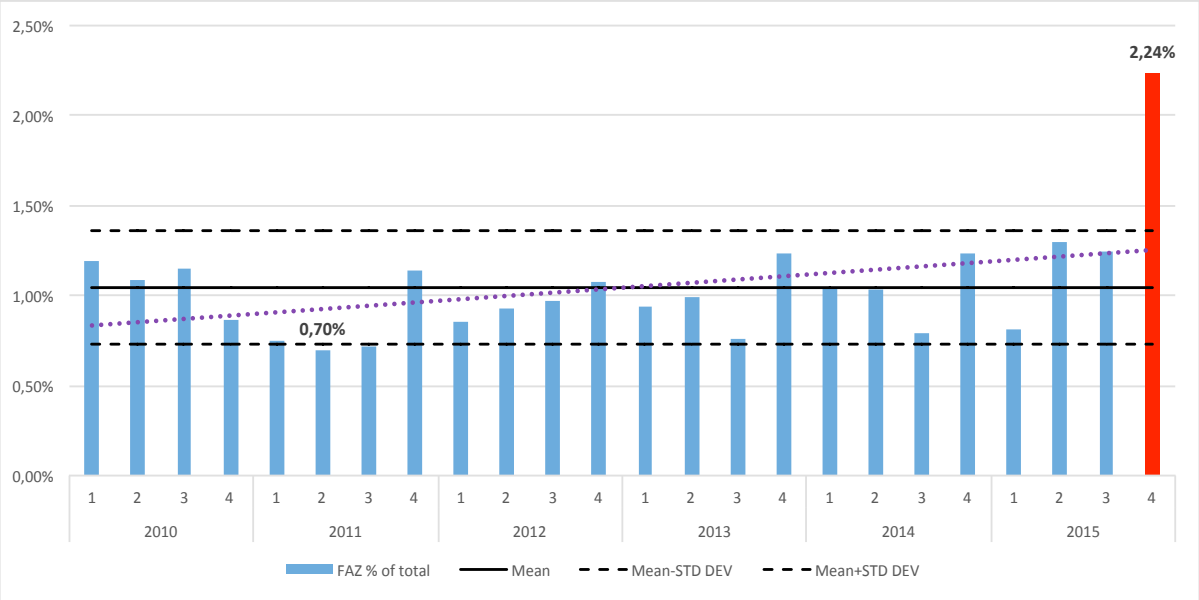
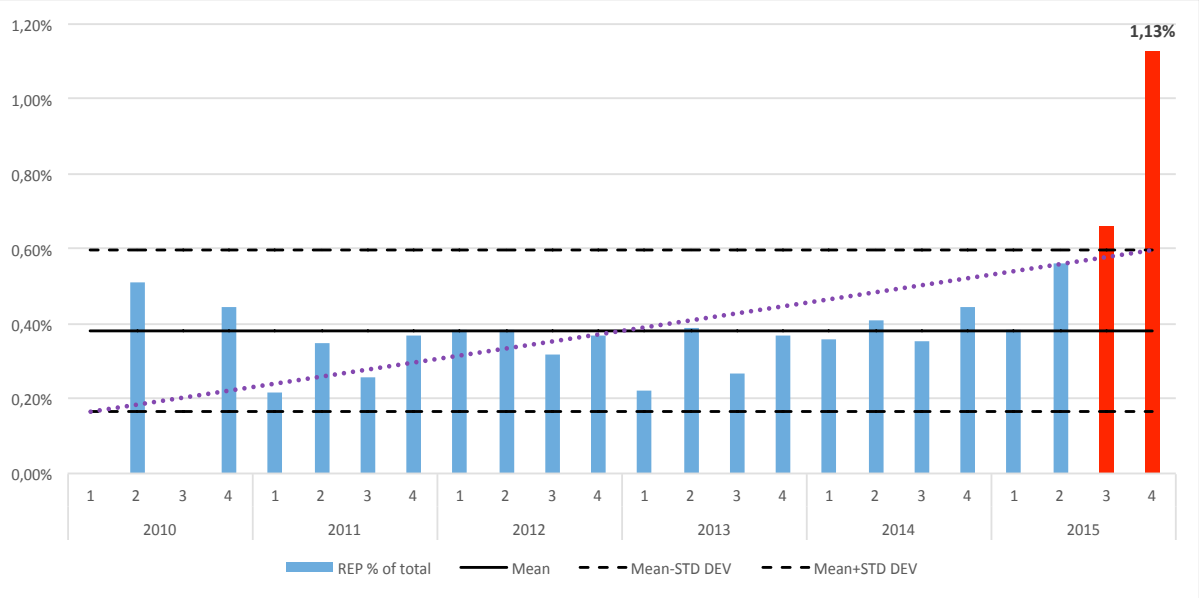


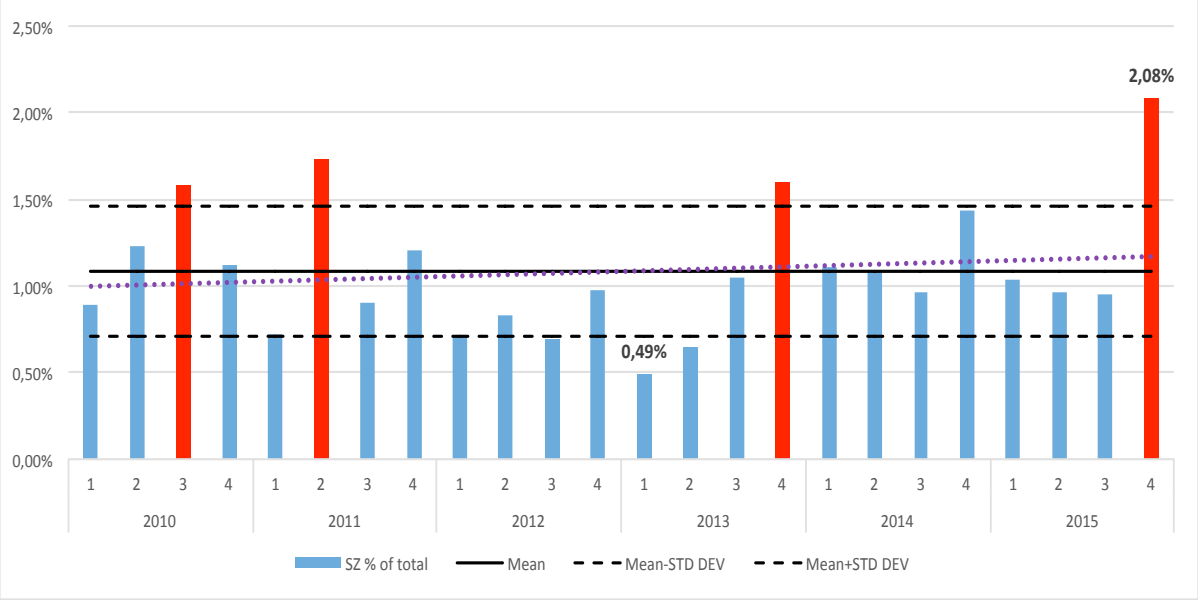
Figure 11. ***La Repubblica*** **2010-2015: Climate change articles, % of total (n=144468)[66]**



[65] Source: Own elaboration on articles from *Frankfurter Allgemeine Zeitung* online archive.

[66] Source: Own elaboration on articles from TIPS database.

Figure 12. *Süddeutsche Zeitung* 2010-2015: Climate change articles, % of total (n=125161)[67]



On the whole, however, climate change coverage in the afore-mentioned newspaper was fairly stable since 2011, and only peaked towards the end of 2015. A rather similar trend can be observed for the German center-right paper, *Frankfurter Allgemeine Zeitung*, where climate change coverage was constant, rarely falling below or exceeding the normal range of oscillation, and furthermore, having its most significant peak also at the end of 2015. In the German center-left daily, *Süddeutsche Zeitung* and the Italian center-right paper, *Corriere della Sera*, instead, climate change coverage was comparatively volatile, with a considerable number of significant peaks and troughs over the years. Thus, it might be said that the constancy with which climate change issues are reported on neither seems to be determined by country differences nor by differences based on political orientation, but rather seems to be paper-specific, probably reflecting the internal politics of different media outlets.

When looking at more specific coverage patterns, it can generally be observed that all papers surveyed, with exception of the *Corriere della Sera,* manifest their most significant peak in the last quarter of 2015, clearly coinciding with the Paris climate summit COP21. For the Italian center-right paper, instead, the overall strongest peak in climate change coverage over the period surveyed can be found in the last quarter of 2012, which is also reflected in

[67] Source: Own elaboration on articles from *Süddeutsche Zeitung* online archive.

Figure 8 where patterns in climate change coverage in Italy and Germany only deviate in 2012, while being, on the whole, fairly similar. These findings might again hint at the fact that coverage patterns are substantially influenced by structural factors such as for instance the availability of financial and human resources at a given moment (see Chapter 4).

Generally, it can be observed that in the *Corriere della Sera* climate change coverage seems to be cyclically concentrated around the UN climate summits annually held towards the end of the year. For each of the years under consideration, the highest share of climate change articles can be found in the last quarter (October to December). The same holds true for the German center-right paper, *Frankfurter Allgemeine Zeitung*, though less pronounced and with the exception of the year 2010, where the fourth quarter has the lowest share of climate change articles. In the two center-left papers this pattern seems to be less distinct, with the *Süddeutsche Zeitung* manifesting half of its major peaks at points that do not coincide with the summits (in 2010 and 2011), while in *La Repubblica* in only half of the years surveyed the pattern observed for the two center-right papers applies, though at any rate in a slightly less pronounced manner. While these differences are certainly not overly significant (at least in the case of *La Repubblica* and the *Frankfurter Allgemeine Zeitung),* they still show that the two center-right papers are paying attention to climate change more consistently on major climate change-relevant occasions, such as the annual summits, while the center-left papers, and especially the *Süddeutsche Zeitung,* seem to show strong interest in the issue also at other points in time.

In sum, then, it might be said that no substantial and overly significant differences based on the political orientation of the newspapers under study can be observed. Differences based on the number and proportion of climate change articles are certainly more pronounced on the country-level, while differences in coverage patterns are fairly individual and paper-specific.

In order to get an idea of how climate change coverage has evolved in Italy and Germany over the twenty years-period from 1992 to 1992, two sample corpora have been constructed for the two center-left papers, *La Repubblica* and *Süddeutsche Zeitung*.[68]Although the two center-right papers had to be excluded from this analysis for reasons regarding data availability and comparability criteria, the two figures displayed below

[68] For details on corpus construction, see Appendix.

are, nevertheless, revealing as they seem to confirm what has been discussed in Chapter 4 and in Chapter 6 concerning worldwide coverage trends and with regards to public opinion on climate change and the presumed importance of the issue on the public agenda in Italy and Germany.

Figure 13. ***La Repubblica*** **1992-2012: Climate change articles, % of total (n=43979)[69]**

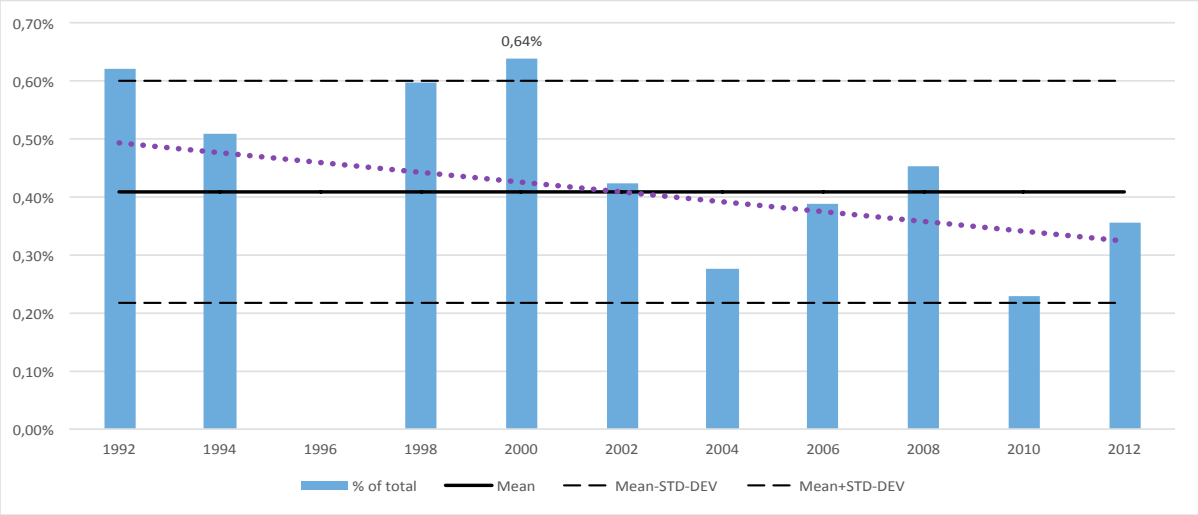
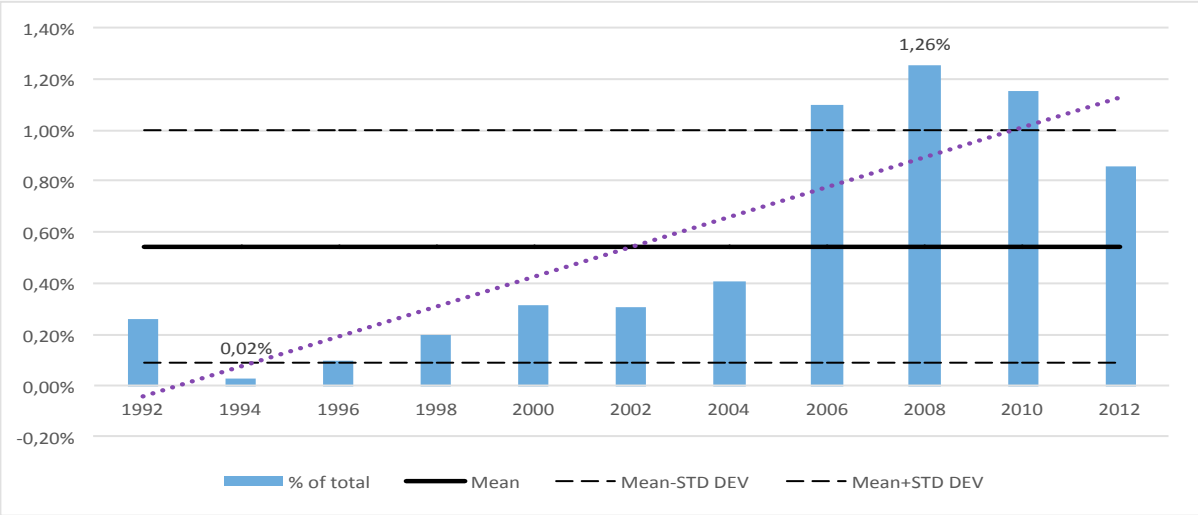


Figure 14. ***Süddeutsche Zeitung*** **1992-2012: Climate change articles, % of total (n=51652)[70]**



[69] Source: Own elaboration on articles from TIPS database.

[70] Source: Own elaboration on articles from *Süddeutsche Zeitung* online archive.

Unsurprisingly, and fairly in line with worldwide trends in climate change media coverage, the overall number of articles dealing with climate change substantially increased since 1992 in both papers. In fact, when comparing the total amount of climate change articles at the beginning and at the end of the period under consideration, the number has tripled. While climate change coverage in the German center-left paper drastically peaked between the years 2006 and 2008, in *La Repubblica* this was already the case in 1992 and between the years 2000 and 2002. While both peaks pretty well correspond with those identified in Chapter 4, it might be assumed that these differences in article distribution are in large part influenced by the respective domestic political context in which these newspapers operate. As mentioned earlier in Chapter 6, the first years after the ascension of the Merkel government in 2005 represented new momentum for ambitious climate policies; in Italy many seminal climate protection acts and initiatives have been passed under the center-left coalition governments in power during the late 1990s and early 2000s (Pozzo, 2012; OECD, 2003; Weidner & Mez, 2008).

Be that as it may, while the total number of climate change articles increased in both publications, rather diverging trends can be observed with regards to the relative space granted to the issue over time. In fact, and as Figures 13 and 14 illustrate, in *La Repubblica* the number of climate change articles did not increase in the same proportion as the total number of articles published. In the German newspaper *Süddeutsche Zeitung* the share of climate change articles of the whole of articles published rather drastically increased, especially since 2006, coinciding with the moment when the issue really "took off" in Germany as suggested by the Eurobarometer data discussed in Chapter 6.

7.2 How do the media in Italy and Germany talk about climate change?

7.2.1 Topics

In order to gain a better understanding of how the media in Italy and Germany reported on climate change, from which angle and in terms of how the issue was thematically "framed", a first step has been to single out the thematic areas that characterize climate change coverage in the two major quality newspapers representing each country. For this purpose, an

automatic procedure called *topic detection*[71] has been employed, identifying those topics that are more likely than others to represent the collection of articles under study, tracking the way the issue was articulated at different points in time and the way climate change was coupled to and decoupled from other issues of public interest dealt with in the media.

The *topic detection* has been carried out only for the articles published between 2010 and 2015 since the technique the procedure is based on (see footnote below) is more effective on large corpora. As explained in the Appendix, for the time span between 2010 and 2015 all articles published, and corresponding to the selection criteria, have been stored and made available for further analysis, while for the medium-to long-term period (1992-2012) only a sample corpus has been constructed.

Based on their overall relevance within the corpora, for each country the ten most relevant topics have been identified and displayed according to their respective ranking in each of the years surveyed (see Tables 7 and 8). Those thematic areas that frequently appeared more than once within the same year have been generally split into sub-topics. In order to identify those topics that belong to the same thematic area, they have been uniformly colored.

Looking at the results obtained with the above-mentioned procedure, it can be ascertained that in the early 2010s climate change has been dealt with from a number of different but persistently recurring thematic perspectives, in all four newspapers under study. Furthermore, the most relevant topic (the first topic in the ranking list) in both countries is rather constant over time, with, especially in Germany, only one minor change during the six-years period in question.

Within the German corpus the most relevant topic for most of the years was *Global climate governance,* a topic that is centered on climate change in rather broad terms, addressing the issue as one of universal relevance and with future implications for states and individuals worldwide and dealing with consequences and necessary societal responses.

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[71] A computer-based technique employing the algorithm *Latent Dirichlet Allocation (Lda)* which identifies topics (groups of words with different probabilities of being part of a given topic) within large bodies of text. On the basis of the probability that an article within the corpus is part of a topic (the maximum number of topics, in the present case 20, is arbitrarily preset), the overall relevance or weight of each topic within the corpus is calculated. On the basis of the list of keywords, each topic is then interpreted and denominated by the researcher. Details on article selection criteria are expressed in the Appendix, Chapter 10.

Table 7. FAZ and SZ: Evolution of the ten most relevant topics, 2010-2015 (n=491)[72]

	2010	2011	2012	2013	2014	2015
1	Global climate and energy governance	Global climate and energy governance	Global climate governance	Global climate governance	Global climate governance	Global climate governance
2	Cancun climate summit	Durban climate summit	Doha climate summit	Energy governance	Energy governance	Paris climate summit
3	National climate politics		EU climate politics	Climate impact research	International climate politics	Climate impact research
4	Climate impact research	Climate impact research	Energy governance	IPCC	EU climate politics	Energy governance
5		Conference negotiations		Conference negotiations	Climate impact research	IPCC
6	Atmospheric science			Warsaw climate summit	IPCC	Carbon governance
7	Conference negotiations	Climate agreement		Energy security	Warsaw climate summit	National climate politics
8					Carbon governance	
9		Carbon governance		International climate politics	New York climate summit	
10			Energy Market		Atmospheric science	
11			Atmospheric science			
12	IPCC				Energy security	
13	EU climate politics					
14		EU climate politics	International climate politics			
15		Carbon engineering	National climate politics		Energy transition	
16		Nuclear energy				
17						Atmospheric science
18						
19			Atmospheric science			
20					EU regulations	

[72] Source: Own elaboration on topic detection results, based on articles from *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* online archives.

Table 8. COR and REP: Evolution of the ten most relevant topics, 2010-2015 (n=1135)[73]

	2010	2011	2012	2013	2014	2015
1	Global climate and energy governance	Global climate and energy governance	Global climate and energy governance	Sustainable development	Sustainable development	Sustainable development
2	Int. climate negotiation	Climate impact research	Climate impact research	Climate impact research	Climate impact research	Int. climate negotiation
3			Green economy	Energy governance	Energy governance	Energy governance
4		Int. climate negotiation	Int. climate negotiation		Int. climate negotiation	
5		Green economy	Sustainable cities and citizens	Global food governance	EU climate politics	EU climate politics
6	Wind parks	Energy systems	Biodiversity		Ecosystems	Green economy
7					Biodiversity	
8			EU climate politics			Biodiversity
9	Nuclear energy					
10	Biodiversity	Mediterranean ecosystems	Food production	Waste/transport	Global food governance	
11	Alternative fuels			Species extinction	Sustainable food Italy	Climate impact research
12					Awareness campaigns	
13					Food production/ agriculture	Waste/transport
14		Local wind farm			Arctic ecosystems	
15		Eco-friendly diet	Global food governance	Sustainable businesses		
16	Awareness campaigns	Food production/ agriculture				Diet/well-being
17				Mountain ecosystems		
18		Species extinction			Regional waste management	
19						
20						

[73] Source: Own elaboration on topic detection results, based on articles from TIPS database.

The topic's stable and strong presence (average weight:1,2449) and the fact that it does not contain any keywords[74] referring to particular, outstanding and parenthetic events and issues, seem to indicate that climate change as a pressing global problem with far-reaching implications is well-anchored in public discourse and firmly established as a self-contained topic on the German media agenda.

It is interesting to note that in the course of the first five years of the current decade *Global climate governance* has become decoupled from the rather closely related topic of *Energy governance*. As Table 7 shows, while being part of the same topic in the first two years of the period under consideration, in 2012 both issues become two distinct topics.[75]Generally and as can be inferred from the table above, energy-related issues had, overall, a fairly strong presence within the corpus and represent on average the second most relevant topic within the collection of articles with an average weight of 0,4944.

A part from the topic named *Energy governance*, dealing with energy-relevant themes in more general terms, also a number of less relevant and nonrecurring topics that deal with rather specific and not climate change-centered energy issues can be found (colored in grey). *Nuclear energy*, for instance, makes an appearance only in 2011, which can probably be directly linked to the German nuclear phase-out decided on in the aftermath of the Fukushima incident. Generally, and given Germany's role as one of the largest energy producers and consumers in Europe with high levels of energy dependency (see Chapter 5), the strong presence of energy issues within the corpus seems to be little surprising.

The third most relevant topic for the German corpus is *International climate negotiations* (colored in red), essentially dealing with the United Nations Framework Convention on Climate change (UNFCCC) and its Conferences of the Parties (COPs). The fact that *International climate negotiations* is strongly centered around these annual climate summits becomes evident when looking at the keywords which, in the course of the years, change only slightly and mainly on the basis of changing summit locations and the varying prominent political figures involved. It must be noted that the topic is generally amply articulated within the German corpus. As illustrated in Table 7, in four out of six years more than one topic deals with *International climate negotiations*.

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[74] Each topic consists of a list of 100 keywords, ordered according to their relevance within each topic.

[75] This might be related to an augmented focus on energy issues in the wake of the Renewable Energy Sources Act amendment in 2012 or the general emissions increase between 2009 and 2013 (see Chapter 5).

Comparing the German with the Italian corpus, many similarities can be identified, but also some striking differences. First of all, also in the Italian articles energy issues are fairly prominent. In fact, when considering all energy-related topics, the issue is in sum the most relevant within the collection of articles (average weight: 0,4809). It can be noted that the different types of energy topics present in the Italian corpus are mainly centered around different types of energy systems, from nuclear to wind power and solar energy. The salience of renewable energy sources seems to reinforce what has been discussed in Chapter 5 with regards to the rapidly expanding alternative energy sector in Italy, and the high share of renewables in gross final energy consumption.

Also for the Italian corpus a shift concerning the most relevant topic can be ascertained towards the middle of the period surveyed. As is the case with the German corpus, the most relevant topic over the first years of the early 2010s was *Global climate and energy governance.* In 2013 the topic was divided into an independent topic on *Energy governance*, as in the German case, and a topic that probably can best be denominated as *Sustainable development*. It must be noted though that the latter, rather than being a genuine new entry, is somehow a continuation of many of the climate governance aspects of its predecessor,[76] with, however, only marginal direct reference to climate change. Rather the topic is, as the name implies, centered around sustainable development in a fairly broad sense, containing keywords such as "environment", "development", "resources", "growth", "population", "future" and "security". Obviously, climate change as a global problem with deep environmental and socio-economic implications is strongly intertwined with issues concerning sustainable development. Thus, it seems that climate change in the Italian media discourse has become firmly embedded in wider considerations concerning the future of the planet as a whole.

Some interesting differences can be detected with regards to the science-related topics dealt with in the two countries. While in both corpora there seems to be a relatively strong focus on science issues,[77] it is interesting to note that *IPCC*, basically a hybrid between the realm of science and politics, is a self-contained topic in the German corpus. This seems to

[76] Some of the keywords the two topics have in common are for instance: "world", "year", "Italy", "planet", "countries", "global", "environment".

[77] As shown in Tables 7 and 8, in the German corpus three different science issues are among the ten most relevant topics; in the Italian corpus two science topics can be found among the top ten.

reinforce the fact that the political component plays a rather important role in German climate change coverage. In fact, as compared to the Italian articles the German corpus contains twice as many genuine politics-topics among its top ten.

What certainly leaps to the eye in the Italian corpus is the strong presence of the topic *Food*, dealing with all sorts of issues regarding food production, consumption and governance, and of the topic *Local sustainability* (colored in yellow), mainly discussing eco-friendly initiatives by cities and regions, involving citizens and businesses, as well as issues regarding individual consumer behavior. It is striking to note that both topics are unique to the Italian corpus and completely absent from the German one. However, when considering the fact that the agri-food sector is one of Italy's most important industries (Fortis & Sartori, 2016), when taking into account the variety of Italian traditional high quality food products and the cultural centrality of food such local variety seems to implicate, the prominence of the topic *Food* is certainly little surprising.[78] What is more, the strong local perspective that seems to characterize the Italian articles is fairly in line with previous findings concerning environmental communication in Italian newspapers. Nofri (2013) could, in fact, show that the two major dailies in Italy tend to "think local" (p.189), mentioning local bodies, medium-sized companies and civil society actors to a significantly greater extent than the two German newspapers examined.[79]

The afore-cited author did also discuss the fact that the two Italian papers seem to often adopt a "cultural" perspective when reporting on environmental issues, by referring for instance to events and personalities from popular culture or to "spare time activities" (p. 328). When looking at the whole of topics identified for the Italian corpus Nofri's findings seem to be reinforced. In fact, in four of the six years surveyed one can find the topic *Culture*, referring mostly to the realm of arts, literature, popular culture but also featuring anecdotal articles and crime news.[80] Also Beltrame, Bucchi and Mattè (2012) could show with their analysis of climate change coverage in the Italian newspaper *Il Corriere della Sera* (between

[78] In 2014 Italy ranked again first with regards to the number of Protected Denomination of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Specialities Guaranteed (TSG) certifications granted by the European Union (Istat, 2016).

[79] Her analysis was conducted for the same newspapers as those studied in the present research.

[80] Although the topic *Culture* appeared frequently, it had little relevance, ranking always towards the lower end of the list of 20 topics.

2004 and 2007) that climate change had become a sort of "masterframe" (p. 46) for all news genres and a common rhetoric device for all types of actors within the mediated public sphere. Interestingly, for the German corpus no cultural topic could be identified. Instead, among the less relevant topics placed towards the end of the ranking list one can find, for instance, a topic probably best referred to as *Sociological reflections*, dealing with the wider social and political implications of climate change, featuring for instance interviews with sociologists who speak about the relationship between climate science, society and the democratic process.

With regards to differences according to the political orientation of the newspapers[81], it is interesting to note that the topic *Culture* identified in the Italian corpus is apparently confined to the center-left paper *La Repubblica* (where also the topic *Local sustainability* ranks higher and among the top ten). What is more, both newspapers ascribed to the center-left of the political spectrum feature a topic here denominated as *Third world poverty/ Development assistance*, generally absent from the two center-right papers.

Certainly, these differences concerning the topics that characterize media coverage in both national contexts strongly reinforce the assumption that climate change coverage, and media production in general, are substantially influenced by cultural as well as ideological factors (see Chapter 4).

7.2.2 Actors

As discussed in Chapter 4, the different actors that are featured in, dominate or are excluded from climate change media coverage are central to the configuration of the specific discourse that evolves around the issue in a given context. Furthermore, the role different actors assume in stories about climate change seem to have strong implications for how audiences perceive and engage with the issue. It has often been argued that "ordinary" citizens are rarely at the center of narratives developed around climate change, and that the focus often rather lies with the actions of governments and other public figures. Generally, such reporting has been considered to be fairly counterproductive for "constructing behavioural possibilities" (Happer & Philo, 2016, p. 147).

[81] A corpus with all climate change-relevant articles published between 2010 and 2015 has been built for each newspaper under study.

For the purpose of identifying those actors that dominate media coverage in Italy and Germany (as measured by the four newspapers examined in the current study), I have created three different corpora per country, each containing articles from one specific survey period, and subsequently analyzed the articles with the help of a qualitative text analysis software.[8] The COP21 in 2015, including one week before and after the event, has been selected as one of the study periods, as all four papers have, as discussed above, substantially covered the event. For the other two corpora, the four months-period between September and December, for 2011 as well as 2013, have been chosen, in order to adequately distribute the samples over the period under consideration (2010-2015) and because the last months of each of the years surveyed were generally, though certainly not consistently in all papers for each year, characterized by a higher concentration of climate change coverage. The months between September and December 2013, for instance, were characterized by a number of other climate change-relevant events, apart from the annual COP, such as the publication of the fifth IPCC assessment report and typhoon Haiyan.[83]

For all three sample periods mentioned above actors have been coded and divided into three main categories, "countries, cities, regions", "institutional actors" and "individuals", covering three different dimensions to which actors have been ascribed to and, broadly speaking, allowing for the distinction between the micro and the aggregate-level of action. This categorization of actors has been useful for assessing whether climate change coverage in Italy and Germany granted significant space to individual members of civil society and their role in causing and reacting to global climate change (e.g. "normal" citizens and consumers) or whether coverage was, as previous research suggests, mostly confined to the "big" organized stakeholders in the game (either bodies or single outstanding institutional actors) who publicly raise claims, negotiate, define and decide on the issue, such as for instance intergovernmental organizations, politicians, scientists or NGOs.

[82] The software *QDA Miner* has facilitated an analysis process by which relevant segments of text have been coded according to categories which have been defined by the researcher in order to identify and discover patterns with regards to specific dimensions of the content of the articles. For more detailed information on the coding process, see the Appendix.

[83] Details on article selection criteria are expressed in the Appendix.

The category "individuals" contains, besides "citizens/consumers" three more sub-categories: "victims", "activists" and "others".[84] This division has been useful for assessing whether climate change coverage features the perspective of average citizens and consumers (probably the types of actors that are most likely to be identified with by the average reader of the newspapers under study), or rather focuses on individuals with an enhanced degree of environmental awareness and personal engagement such as activists, or individuals referred to as victims. With regards to the latter sub-category, it might be assumed that in most cases in which victims are mentioned there is less focus on behavioral possibilities. What is more, those individuals referred to as victims are likely to be from poorer, less developed countries where, due to relatively low adaptive capacities, climate change has usually more catastrophic impacts.[85] The sub-category "others" covers individual civil society actors, which are mostly prominent public figures, such as for instance celebrities or writers, who somewhat stand in contrast with the concept of the "normal" citizen.

Also institutional actors have been further divided into four broad categories (politics, science, economy and civil society), since in the articles read this actor category basically covered stakeholders from these four areas of society and, furthermore, because this categorization made it possible to gain a better understanding of the specific perspective from which the newspapers reported on climate change.[86] What is more, this categorization was useful for verifying whether, as previous research has suggested, political figures and institutions generally prevail in climate change coverage. While single institutional actors as well as institutional bodies and organizations have been coded separately, the distinction has proved to be not overly relevant for the purpose of this study, therefore all types of institutional actors belonging to the same area of society have been merged into one sub-code (see Appendix). However, in view of previous research suggesting that prominent political figures often play important roles in climate change coverage, the two most mentioned actor

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[84] For an overview of all actor categories and sub-categories, see Table 10 in the Appendix.

[85] See IPCC Working Group II (IPCC, 2014).

[86] The categorization of actors in the current study has also been inspired by Nofri (2013), In her empirical study on environmental communication, she coded actors and themes along four broad dimensions or "pillars": Science, economy, politics and society. She derived this framework from the concept of *sustainable development* as operationalized within the United Nations context where every approach to environmental themes takes into account stakeholders from all of these four spheres. Her analysis has shown that journalists from different media outlets and countries integrate these four areas in different ways into their coverage of environmental issues.

types within the category of political institutional actors have been extracted for further analysis (see below).

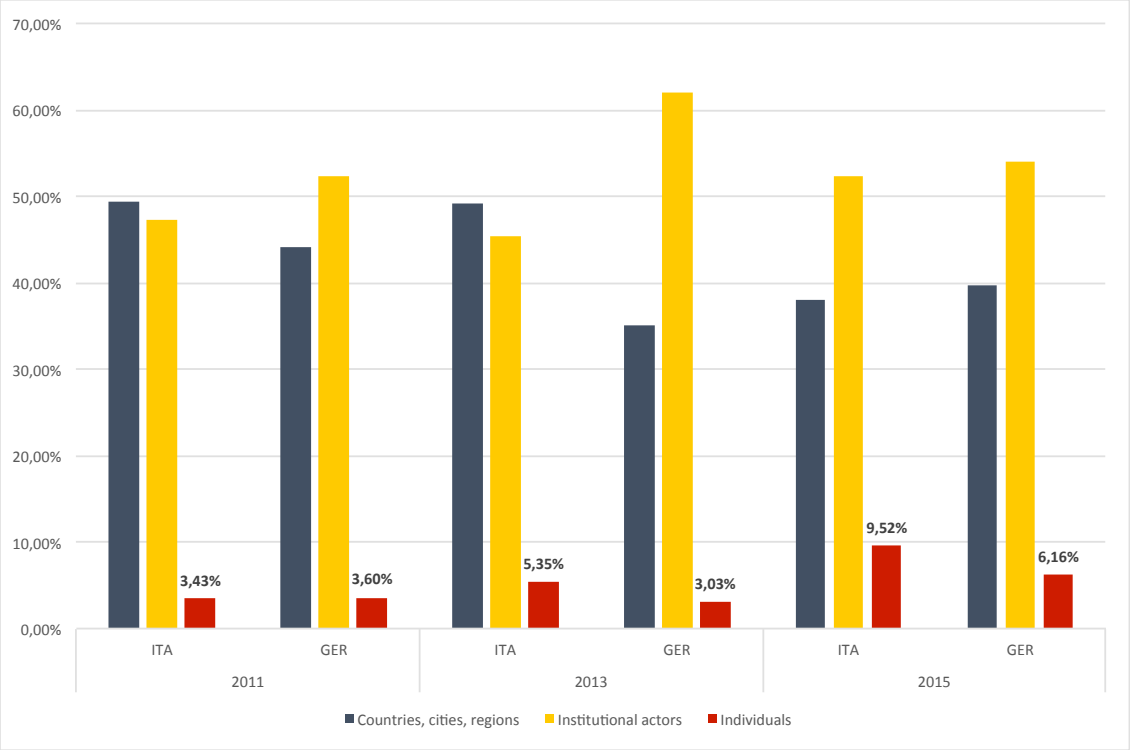
What is more, another aggregate-level category has been added because, and as a first reading of the articles had shown, macro-units such as countries, cities and regions take on various roles in climate change coverage, being often mentioned in terms of institutional actors, such as governments, but also as more diffuse geographical, cultural and economic units. Their mentioning generally seems to take the discourse to a more abstract level where often unspecified aggregates of actors or large impersonal entities interact with or play important roles in relation to climate change, which stands in contrast to the more nuanced picture of the role of distinct individuals. What is more, by distinguishing between countries, continents and world regions on the one side and cities and national regions on the other, it has been possible to assess whether climate change coverage tends to focus on the global level or whether also a local perspective is incorporated when dealing with the issue. As has been discussed in earlier chapters, a local perspective in climate change communication might prove to be more effective for triggering individual engagement.

In Figure 15 the share of actors (belonging to the above-cited three actor categories) mentioned in the title, subtitle and first paragraph of the articles under study are displayed per country and for each sample-period.[87] Looking at the distribution of actors by category it can be ascertained that in all four newspapers institutional actors (as mentioned above, an umbrella term for all types of actors that are members of or act on behalf of any kind of institutional structure, from national governments, inter-governmental and non-governmental organizations, to the church, corporate and medium-sized businesses, universities and think-tanks etc.) clearly prevail, with an average share of 48,35 %, in Italy, and 56,09 %, in Germany, of all actors coded**.** Single countries, cities or regions (of the world and within countries) are, on the whole, the second most often mentioned group of actors. Fairly in line with previous research, individual civil society actors, such as "normal" citizens, consumers, but also people identified as climate change victims or single activists and protesters, have

[87] It might be said that a certain prominence is given to actors mentioned in the beginning of an articles, in as much as they, as Nofri (2013) puts it, "'make headlines'" (p. 154). Due to the relatively low number of actors coded, especially for the category "individuals", the numbers of actors mentioned in the two newspaper for each country have been summed up and displayed together.

least often featured in the headlines and at the beginning of the articles surveyed and are, compared to the other two actor categories, significantly underrepresented.

Figure 15. Italy and Germany: Types of actors in title, subtitle and first paragraph (Italy: n=129, χ^2=11.27, p=0.023; Germany: n=130, χ^2=4.63, p=0.326)[88]



As Figure 15 shows, in the two Italian papers under study the share of individual civil society actors of the total of actors mentioned was on average slightly higher than in the German papers. A similar picture emerges considering only the COP21-sample where not only the headlines but whole articles have been coded. Here again Italy leads with respect to the share of individual civil society actors (7, 81 % of total actors coded compared to 5,19 % in the German papers). What is more, also the proportion of "countries, cities, regions" is on average slightly higher in the Italian papers, while the proportion of institutional actors is on average slightly lower: In the 2013-sample, for instance, the share of "institutional actors" in the German papers is rather pronouncedly higher than in the Italian ones, whereas concerning

[88] Source: Own elaboration on data generated through the coding process using the software *QDA Miner*, based on articles taken from TIPS database and *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* online archives; chi square calculated by Dr. Paolo Giardullo (PhD).

the share of "countries, cities, regions" the opposite seems to hold true, being considerably higher in the Italian papers.

While the differences with regards to the share of individual civil society actors between the German and Italian papers are certainly minor ones, which cannot be considered to be overly significant, it is interesting to note, though, that in both countries the share of individuals mentioned seems to have increased when considering the first sample period in 2011 and the last one in 2015. In Italy this increase has been steady over all three samples and was, furthermore, fairly more pronounced than in the German papers. In fact, in Italy the share of individuals mentioned almost tripled, while in Germany the share seemed to have increased a bit less drastically. Be that as it may, while in the Italian papers this fairly pronounced rise in "individuals" mentioned over the three years sampled is also statistically significant (χ^2=11.27, p=0.02), for the German papers this is not the case (χ^2=4.63, p=0.326). These findings seem to suggest that in the two Italian papers individual civil society actors in climate change media accounts gained considerable importance over the years surveyed.

Looking at the composition of the three actor categories when considering all three sample-periods, it can be observed that among the institutional actors coded, those belonging to the realm of politics are by far the most often mentioned in both countries, followed by institutional actors from the world of science and academia, institutional civil society actors, and finally economic institutional actors as the least mentioned sub-category (see Table 9). Within the group of political institutional actors, political bodies, and especially the United Nations, have been the most often mentioned in both the Italian as well as the German papers, while single politicians, mostly heads of states, have been the second most mentioned specific type of actor. These results seem to confirm the centrality of the UN climate summits detected in Chapters 7.1 and 7.2.1, as well as the general salience of prominent political figures in climate change coverage previous research has pointed at (see Chapter 4). What is more, the fact that the share of political institutional actors is slightly higher in the German papers seems to reinforce the *topic detection* results discussed earlier, which have shown that political themes played an even more important role in the German papers.

When looking at the composition of the "countries, cities, regions" -category, it can be ascertained that larger aggregates such as whole countries or entire continents have been mentioned much more often than smaller units such as cities and national regions. While the

difference between these two sub-categories is quite pronounced in both countries, it is much more so in the two German papers (the share of cities and regions of the total of all actor sub-categories mentioned is here only 1,64 %, while the share of countries, continents and world regions is 36,07 %). These results seem to strongly suggest that the Italian papers, as compared to their German counterparts, assume a local perspective fairly more often, which furthermore, reinforces again the findings obtained through the *topic detection.*

Table 9. Sub-categories of actors sorted by prominence based on all three sample periods (% of total of all actor sub-categories; Italy: n=129; Germany: n=130)[89]

		Countries, cities, regions		Institutional actors		Individuals	
ITA	1	countries, continents, world regions	36,73 %	political institutional actors	25,94 %	citizens/ consumers	3,37 %
	2	cities and national regions	9,01 %	scientific institutional actors	10,10 %	victims	1,39 %
	3			institutional civil society actors	6,53 %	activists	0,59 %
	4			economic institutional actors	5,54 %	others	0,79 %
GER	1	countries, continents, world regions	36,07 %	political institutional actors	31,44 %	victims	2,03 %
	2	cities and national regions	1,64 %	scientific institutional actors	11,67 %	citizens/ consumers	1,35 %
	3			institutional civil society actors	8,10 %	others	0,87 %
	4			economic institutional actors	6,56 %	activists	0,29 %

[89] Source: Own elaboration on data generated through the coding process using the software *QDA Miner*, based on articles taken from TIPS database and *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* online archives.

Especially with regards to the mentioning of cities and regions located within each of the two countries under study, Italy is ahead of Germany with 42,86 % of all actors within the category of "cities and national regions" being Italian. In the two German papers the share is only 29, 41 %. Against the background of previous research, showing that messages implying direct links to people's personal experiences seem to be more effective in triggering behavioral change, this must certainly be considered a positive country-specific aspect.

Among those actors ascribed to the category "individuals" (the least mentioned group of actors in both countries) citizens and consumers as well as climate change victims are the individuals most often cited. In Italy the most often mentioned sub-group of individuals is "citizens/consumers" (with a share of 3,37 % of all actors coded), while climate change victims are mentioned only about half as much (1,39 %). In the German papers, instead, climate change victims are the most often mentioned group (2,03 %), followed by citizens and consumers (1,35 %). Thus, the data suggest that the Italian papers, as compared to the German ones, mentioned "normal" citizens more often in their coverage of climate change-related issues.

7.2.3 Actors in context and climate change "frames"

In order to determine whether the mentioning of individuals in climate change coverage in the two countries was coupled with a more effective approach to climate change communication, a closer reading of the articles has been carried out, trying to identify the specific contexts in which individuals were mentioned.

Generally, in all papers surveyed individual civil society actors were often mentioned without being directly linked to climate change in terms of their role as causers and victims of the problem. In the *Frankfurter Allgemeine Zeitung*, for instance, one article refers to the German novelist Frank Schätzing because, according to the author of the article, the scenario of seafloor methane release in East Siberia might perfectly function as a "prelude" to his thriller *The Swarm* published in 2004:

> In an interview given to the British *Independent* on the occasion of an American geophysics meeting, a Russian scientist has been deliberately laying it on thick when talking about his latest methane hydrate explorations in East Siberia. The "Armageddon story" he creates could perfectly function as the prelude to Frank Schätzing's apocalyptic thriller *The Swarm*. (Müller-Jung, FAZ, 16 Dec 2011, own translation)

In an article published by *La Repubblica* shortly before the COP21 in 2015, dealing with Pope Francis' visit to Africa (where he, among many other issues, also addressed the problem of global climate change), reference is made to the different people he encountered such as for instance believers of different religions on the occasion of an ecumenical meeting:

> This morning Pope Francis had a first ecumenical meeting at the Vatican embassy in Nairobi, with Christians, Animists and Muslims. As so often he has called for dialogue: "God's name can never be used to justify hatred and violence [...] At the United Nations Office in Nairobi Bergoglio has again launched an appeal in view of the upcoming climate summit in Paris starting at the end of November [...] (*La Repubblica*, 26 Nov 2015, own translation)

During the COP21 the two Italian papers fairly often referred to the victims of the Paris terror attacks, who account for about a fourth of all citizens mentioned in the respective sample. One article published in La *Repubblica,* for instance, basically consists of an interview with Paris Mayor Anne Hidalgo and deals with a range of issues, from the world mayors meeting held in Paris on the occasion of the climate summit and Hidalgo's position on the French right-wing party Front National, to her memories of the night of the terror attacks:

> The mayor of Paris arrived in front of the Bataclan when the terrorists were still inside the theatre together with the hostages. "A dreadful scene - remembers Hidalgo-but I wanted to be close to the victims and the rescue workers [...] What would you tell an Italian tourist who wants to visit Paris? 'In accordance with the national government the city has triplicated the presence of armed forces in major tourist sights, and doubled it in public transport. All Italians who love Paris may rest assured that they are always welcome and that we will do everything in our power to ensure their safety. (*La Repubblica*, 3 Dec 2015, own translation)

For the COP21-sample it can generally be ascertained that the two Italian papers often featured articles that deal with several topics at the same time, granting for instance one third of an article actually talking about the climate summit to the Paris attacks, while the German articles tended to be more mono-thematic.

On the whole, however, considering all three sample periods, it becomes evident that all four newspapers under study manifested a fairly holistic approach to climate change coverage, emphasizing not only the consequences of climate change for individuals, societies and ecosystems in developing countries as well as in industrialized nations (and even more important, in their readers' own backyard), but also the role individuals play in causing climate change in the first place. In fact, many of the articles analyzed either deal with the implications of climate change for human health, food security, conflicts and migration and mention individuals in their role as climate change victims, or they discuss the impact their

particular life style choices and consumption patterns have in terms of greenhouse gas emissions. What is more, also in articles mainly dealing with international climate negotiations appropriate space is granted to the victims of climate change as central stakeholders in the game. Thus, it might be stated that both the Italian and the German papers exemplarily deliver the whole picture when reporting on climate change.

Be that as it may, concerning the particular contexts in which individual actors are mentioned and the "frame" the issue is given in media accounts, country- and newspaper-specific differences can also be observed. It is, for instance, interesting to note differences with regards to the mentioning of individuals that in a way or another engage in meaningful action against climate change. While in the COP21-sample the Italian papers mostly mentioned demonstrators protesting in the streets for action to stop climate change at the start of the summit, on the German side, more precisely in the German center-right paper, *Frankfurter Allgemeine Zeitung*, one can find reference to consumers who travel carbon neutral, or, in another article, to individuals who invest in climate-friendly funds and who become shareholders in citizen-based energy cooperatives:

> The Swabian retiree is not getting bored: He now owns several photovoltaic power stations. In conjunction with a number of other locals he has founded an energy cooperative in order to produce "clean" energy, with solar parks built on surrounding fields, and to sell it back to the grid, abundantly subsidized by the government's feed-in tariffs. Their motto is "we are the energy transition", and this is not only profitable for the environment but also for the retiree himself. With an investment of 30.000 Euros he now receives a 4,5 percent annual dividend. In times like these certainly not too bad a yield. (Kanning, FAZ, 27 Nov 2015, own translation)

On the basis of what has been discussed before with regards to effective climate change communication, the latter article can certainly be considered a particularly positive example, making concrete suggestions on how to effectively tackle climate change by creating a convenient win-win situation. Generally, and when looking at the two earlier sample periods, it can be ascertained that the *Frankfurter Allgemeine Zeitung* mostly seems to assume a rather pragmatic consumer perspective while basically abstaining from moralizing discourse, in some cases even openly rejecting it: In 2013 the paper sharply criticized that Haiyan, the typhoon that had devastated the Philippines, was being "abused" for putting pressure on world leaders during the Warsaw climate summit:

> Politicians should not play with fears, and even less so with catastrophes. It is therefore imprudent and inappropriate to use typhoon "Haiyan" for blaming the Warsaw climate summit for doing too little for tackling climate change. The victims need to receive immediate and large-scale aid, but help will and should not come from Warsaw. (von Altenbockum, FAZ, 11 Nov 2013, own translation)

By contrast, the German center-left newspaper *Süddeutsche Zeitung*, rather than pragmatically pinpointing opportunities for action, tended to highlight the moral dimension of the problem, often using "stimulus words" referring to obligation and shortcoming, basically discussing what people should and should not do. In one article published in 2013, for instance, the author Detlef Esslinger rather explicitly blames the average consumer for politicians' failure to tackle climate change, pointing out how climate politics can only be successful if citizens are willing to accept the personal sacrifice most climate protection policies entail (e.g. consuming less meat; driving less):

> One 'veggie-day' per week? Five would be better, because there is no bigger and more urgent problem than climate change. It is no wonder, however, that politicians do not dare to seriously tackle the issue: They won't take any risks if people don't urge them to [...] In Bitburg, a small town in the Eiffel region with 13 thousand inhabitants, citizens are protesting against their city council who has decided on constructing a one-way circuitous route inside the city center. People are complaining that they now have to drive one kilometer if they want to reach a shop situated 300 meters in the opposite direction. But the obvious question nobody is raising: Why do they need to use their cars for such a short distance? (Esslinger, SZ, 6 Oct 2013, own translation)

Nevertheless, the paper also emphasized the power of the masses in bringing about political change, even quoting successful examples when talking for instance about the Chinese middle class:

> In recent years, environmental awareness in China has drastically increased. Only a few years ago talking about environmental problems such as smog was still off-limit. When the US embassy diffused Beijing's latest fine dust pollution levels on Twitter in 2010, announcing that the air was "crazy bad", local authorities still reacted furiously: The release of the data was, so they claimed, illegal and had to stop immediately. Millions of Chinese citizens, however, started to seek information about air quality via the embassy and brought pressure to bear via social media-with success: Three years later 500 air measurement stations had been installed in over 70 cities, releasing air quality data in real time. (Behrens, SZ, 30 Nov 2015, own translation)

Be that as it may, such politicizing discourse probably does not necessarily lead to behavioral change in individuals who are generally less engaged with the issue and who have no clear conception of what exactly can be done on a daily basis. Furthermore, the demanding and rather judging tone (as in the article by Esslinger cited above) might increase people's feelings of guilt and powerlessness and ultimately lead to disengagement.

It is furthermore significant, at least with regards to the COP21-sample, that in the *Süddeutsche Zeitung* the majority of climate change articles was published in the science section. In the *Frankfurter Allgemeine Zeitung*, instead, the articles were distributed over five different sections, implicating that a much larger variety of audience segments might have come across them. However, the large majority of climate change articles in the *Frankfurter Allgemeine Zeitung* has been published in the economy section, which certainly underlines the paper's particular viewpoint when dealing with the issue.

Similar observations with regards to the potential for triggering behavioral change can be made for the Italian center-left daily *La Repubblica*. In the 2013-sample, for instance, the paper published an article about rather extensive car use in Italy (as compared to EU average) and its consequences for human health and urban planning:

> Too many cars in Italy: 606 per 1000 inhabitants, while according to the States General of the Green Economy (November 6-7) the EU average is 473. In Italy the share of greenhouse gases generated from transport has risen from 21 to 26 % between 1990 and 2011, and transportation represents the third largest expenditure item after housing and food. Apart from a few positive exceptions, we are again lagging behind in terms of sustainability. (Cianciullo, REP, 17 Sept 2013, own translation)

While the article points, as so often, the finger at Italy's "delay" with regards to a number of sustainability issues (also the *Corriere della Sera* did so), it fails to provide the reader with input on how to conveniently reduce car use. Rather the article concentrates on underlining the need for more investments in urban mobility infrastructure or highlighting single pioneering projects (e.g. electric post delivery vehicles or the "bicipolitana", a bicycle path network resembling a metro system, in the Italian city of Pesaro):

> So it is urban mobility we need to invest in immediately in order to reduce the negative impacts on human health and the environment, but this sector, however, is highly underfunded. With only 10 % of public money necessary for constructing the Turin–Lyon railway, all main Italian cities could be adequately equipped with bike lanes. (*ibid*.)

Without a doubt, long-term and large-scale behavioral change is built on appropriate and facilitating infrastructure but it is probably also true that such a perspective (if not accompanied by concrete measures what can be done despite structural shortcomings) ultimately hinders individuals from taking action as they might feel that the responsibility and the power to make a change lies exclusively with top-level decision-makers.

Furthermore, it seems that also *La Repubblica* (like the *Süddeutsche Zeitung*) is fairly likely to highlight the responsibility of the developed world and the individual consumer within it for causing climate change. Unlike the *Corriere della Sera, La Repubblica* has dedicated a whole article to an Oxfam report on carbon inequality released in early December 2015:

> The world's richest 10 % are responsible for producing 50 % of carbon emissions while the poorest- about 3.5 billion- account for only 10 %, being at the same time the first to suffer from floods, droughts and other disasters caused by the effects of climate change. This has been brought to attention by a recent Oxfam report, releasing data on the differences in emissions generated by consumption patterns in rich and poor countries [...] We should not forget that the majority of the world's poorest live in rapidly developing countries, and although these economies need to do their bit, it is up to the developed world to act on climate change more vigorously. (*La Repubblica*, 2 Dec 2015, own translation)

Also the *Corriere della Sera* did not feature particularly engaging articles. However, the tone the paper mostly assumed seems to be somewhat more "neutral" when compared to *La Repubblica* and the *Süddeutsche Zeitung.* While also the *Corriere* did obviously not miss an opportunity to point at Italy's shortcomings with regards to sustainability issues (for instance when reporting on the winners of the City Climate Leadership Award in September 2013: "From Bogota to Copenhagen, from Melbourne to San Francisco-10 cities leading the way in environmental initiatives: but none of them is Italian.", Saporiti, COR, 9 Sept 2013, own translation), the paper seems to often report on positive initiatives in other countries, for instance on a large tidal energy project off the coast of Scotland:

> Scotland: Full speed ahead with tidal power- A project designed for becoming the Saudi Arabia of tidal energy [...] In Scotland the construction of the world's largest tidal energy system has begun [...] Once in operation the system will be able to cover 40 % of the Highlands' energy consumption, providing about 42 thousand homes with electricity. (Traverso Saibante, COR, 17 Sept 2013, own translation)

Also with regards to individual consumer behavior the paper seems to take a less judging stance, unlike the *Süddeutsche Zeitung*, dealing with the issue from a seemingly more pragmatic and even optimistic perspective. When for instance reporting on a recent study that had shown how people over 65 produce much less emissions and that population aging will therefore probably help to reduce climate change, the paper headlines:

> Climate change: the elderly will save the world. With advancing age people emit less greenhouse gases-the study is based on data available for US residents, but the same holds true for other developed countries [...] Population aging in industrialized countries will save the world from the threat of climate change? A hypothesis not to be underrated. (Virtuani, COR, 9 Nov 2011, own translation)

In summary it can be ascertained that the articles in both the Italian and German papers do, on the whole, appropriately depict the multi-faceted role individual civil society actors have in global climate change, telling the story of single victims, discussing the wider societal implications of the issue, pointing out how everyday consumption patterns contribute to the problem and presenting individuals also as political agents and drivers of change. Generally, the proper mentioning of the different roles of individuals with regards to climate change seems to be firmly established mainstream in both countries, considering that the four papers under study do not manifest constant and considerable differences despite their different political orientations. What is more, the fairly similar approach to climate change in both countries seems to reinforce findings from previous research suggesting that there might be such a thing as a European climate change discourse.[90]

However, with the exception of the one article published in the *Frankfurter Allgemeine Zeitung* cited-above, the articles in both countries' newspapers cannot be evaluated as particularly engaging. In fact, almost none of the articles surveyed provides the reader with concrete ideas on how to tackle the problem on the individual level, and more importantly, how to do so with minimal sacrifice and without creating a major conflict of interests. Although the share of individuals mentioned in the Italian papers substantially increased, a closer reading of the articles has shown that this increase did not coincide with a more effective approach to climate change communication. Rather the augmented number of individual civil society actors mentioned seems to be related to a series of events that somewhat intersected with stories about the climate summit (as mentioned above, the Paris terror attacks and the Pope's visit to Africa).

Especially the mentioning of victims of the terrorist attacks seems to hint at differences in journalistic culture and the fact that the two Italian papers featured much more "mixed" articles, where a variety of different issues are discussed and where often, in the case of the COP21-sample, the climate summit is integrated as a sub-theme. As mentioned above, in the two German papers, climate change articles in the COP21-sample were mostly mono-thematic, dealing either exclusively with the summit or exclusively with a specific climate change-related issue. This is also reflected in the fact that, while in the COP21-sample the two Italian papers featured climate change articles in nine different newspaper sections (from

[90] See for instance Olausson (2009) or Brossard et al. (2004).

economy and science to a special Vatican or culinary section), the German articles covered only about half as many.

Certainly, these findings seem to reinforce what has been discussed in Chapter 7.2.1 concerning the usage of climate change as a "masterframe" in Italian media discourses (see Beltrame, Bucchi & Mattè, 2012). Against the background of what has generally been considered "good" climate change communication (see previous chapters) this incorporation of climate change in the various areas of public interest, as observed for the Italian papers, might be regarded as fairly positive. What is more, the mentioning of the victims of the terror attack or the detailed coverage of the street riots in the run up to the Paris summit might hint at the fact that in Italy there is, as Nofri (2013) puts it, "a lack of a clear-cut real yellow-press sector" (p. 85), which might result in a stronger tendency to tabloidization in the Italian quality papers.[91]

All in all, then, considering the fact that the economically liberal and moderately conservative *Frankfurter Allgemeine Zeitung* was the only paper which published an article that may be considered to have a strong potential for triggering climate relevant behavior, it might be assumed that a less engaged and more pragmatic approach to climate change communication might ultimately be more suitable for triggering behavioral change than the more committed and often moralizing approach prevailing in the left-leaning papers.[92] At any rate, such an approach is more likely to reconcile contemporary lifestyle choices and most people's limited readiness to make sacrifices with the widely recognized need to counteract climate change. What is more, by presenting concrete ways of how to create convenient win-win situations, such articles are fairly likely to motivate even those who have been less conscious and engaged from the outset.

[91] Although "tabloidization", as referring to style, presentation and content of news items, does not seem to be a clear-cut defined concept, some authors such as Bird (2009) have pointed out how many publications "recognizable as tabloids" (p. 41) feature a mix of "news and entertainment" while devoting much space to celebrity news and "sensational human interest stories" which often tend to focus on "crime and mayhem" (*ibid*.).

[92] From Nofri 's (2013) study has emerged that the "committed" type of environmental communication seems to be especially common in journalists writing for "left-of-the-centre newspapers " (p. 344).

7.3 Summary of main findings

Summarizing what has emerged from the current chapter, it can be ascertained that some of the hypotheses made earlier have been confirmed. In fact, the data clearly indicates that in the two German newspapers, *Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung*, climate change is fairly more salient than in the two Italian papers, *Corriere della Sera* and *La Repubblica*, in terms of both the number of articles and their share of the total of articles published. However, when looking at the way climate change coverage developed over the years surveyed it becomes evident that coverage patterns in the Italian and German quality press were, on the whole, fairly similar and, furthermore, in line with worldwide coverage trends.

It has also become evident that with regards to the political orientation of the four newspapers under study no significant differences can be observed. Amount and proportion of climate change coverage were slightly and insignificantly higher in the center-left papers, while with regards to specific coverage patterns almost no similarities or differences on the basis of political orientation could be observed. In all papers climate change coverage substantially peaked at the end of 2015, coinciding with the Paris summit. Furthermore, while in all papers a slight concentration around big, attention-catching international events such as the UN climate summits can be observed, this seems to be a somewhat more consistent pattern in the two center-right papers. However, in general it could be noted that all papers under study demonstrated, on the whole, fairly individual coverage patterns, which hints at the fact that the internal politics of different media outlets might have an even stronger influence on peaks and troughs in issue attention than ideological and country specific aspects. What is more, looking at the medium- to long-term coverage trends (1992-2012) of the two center-left papers, several of the findings obtained in the previous chapters concerning worldwide coverage trends and general issue salience could be confirmed.

It has also emerged that between 2010 and 2015, in both the Italian and German papers, climate change was articulated in a number of relatively stable and recurring themes, most prominently energy-related issues, but also climate science and international climate negotiations. Certainly, the fact that climate change was well established in a number of persisting discourses also reflects how the issue is strongly interwoven with all sorts of socially relevant topics. Especially in Germany, and to a lesser extend in the Italian papers,

climate change was a fairly self-contained topic (for most of the time span surveyed *Global climate governance* was the most relevant topic in the German papers), which seems to hint at the fact that the issue is obviously newsworthy for its own sake. Be that as it may, rather pronounced country specific differences could also be observed. In this context especially the topics *Food*, *Local sustainability* and *Culture,* exclusively present in the Italian corpus, leap to the eye, and strongly suggest that cultural particularities strongly influence climate change coverage. With regards to the German papers, it as emerged that political themes played a fairly important role. What is more, also concerning the political orientation of the papers, differences could be observed: While in the Italian context the topic *Culture* was confined to the center-left paper *La Repubblica*, it could generally be observed that the center-right dailies obviously seemed to refrain from discussing climate change in relation to third world and development issues.

Analyzing the specific actors that dominate the scene in the Italian and German quality press, it has emerged that in both countries institutional actors, like NGOs, scientists, political bodies, politicians and economic institutions as well as more generic macro-unit actors such as for instance whole countries and cities, clearly received most attention in climate change coverage. While this certainly reinforces previous research, it can also be ascertained that in the Italian papers the share of individual civil society actors (such as citizens and consumers, activists and victims) was, as compared to the German ones, slightly higher and, furthermore, rose considerably over the three sample periods under consideration (in the COP21-sample the share had almost tripled). However, when looking at the specific instances in which these individual actors appeared, it becomes evident that they were rarely mentioned in a, for the purpose of effective climate change communication, meaningful way.

Especially when considering the COP21-sample, it can be noted that the strong increase of the share of individual civil society actors mentioned in the Italian papers seems to be in large part contingent upon a number of events coinciding with the climate summit, such as the Paris attacks (the victims of the terror attacks made up a large proportion of this actor category). This coupling of a variety of different issues to the climate summit and to climate change in general seems to represent a rather country-specific feature and might also reflect the specific journalistic culture that seems to prevail in the Italian context, where there generally seems to exist a slightly stronger tendency to tabloidization, and an often rather

"cultural" approach ("culture" in the sense of the topic *Culture* identified in Chapter 7.2.1, which included a variety of societal issues from popular culture to anecdotes and crime news) when reporting on climate change, and on environmental issues in general (see Nofri, 2013).

Furthermore, the strong local focus in climate change communication, already observed for the Italian papers with the help of the *topic detection,* has been reinforced by the high share of cities and national regions mentioned, and also seems to represent a particular feature of the Italian climate change media discourse (the topic *Local sustainability* was present only in the Italian corpus).

Generally, and while in both countries the multi-faceted role of individuals was adequately incorporated into reporting about climate change, only one article, published in the German center-right paper *Frankfurter Allgemeine Zeitung*, has been found to have a strong potential for triggering behavioral change in individual members of the audience (especially those with low levels of environmental consciousness).[93] What is more, a closer reading of the articles has shown that the center-left papers, as compared to the center-right ones, have often assumed a more moralizing and less pragmatic tone in their coverage of climate change and when mentioning individual civil society actors, which might ultimately prove counterproductive for motivating the less committed reader.

[93] Of course it must be kept in mind that different segments of the audience are likely to react fairly differently to the same messages (see Chapter 4).

8 Conclusions

Based on the idea that individuals and their perception of the issue play a crucial role for successfully tackling climate change in the long run, as well as on the assumption that media representations play a central role for public discourse and public opinion formation, the present study has analyzed media coverage of climate change and public opinion in two distinct national contexts, Italy and Germany. In doing so, it has aimed at gaining a better understanding of the way these two elements have evolved and relate to each other in differently natured socio-economic, cultural, political and environmental settings.

For this purpose, the study has comparatively assessed the nature and development of public opinion on climate change (based on Eurobarometer data, see Chapter 6) and of climate change media coverage (based on empirically collected data, see Chapter 7) in Italy and Germany over previous decades and years. It has, furthermore, tried to determine for each country *if* and *how* the data on public opinion and the empirical data on climate change media coverage relate to and correspond with each other. On top of that, this study has tried to respond to the question whether climate change communication in the Italian and German quality press has generally shown the potential for triggering behavioral change, a feature that might be considered to account for "good" climate change communication, especially in view of the need for individual citizens' support in successfully implementing climate change policies. In the following pages I will draw conclusions with regards to the above outlined points of analysis and on the basis of the findings discussed in the previous chapters.

Broadly speaking, and as measured by the Eurobarometer, among both Germans and Italians there basically seems to exist a fairly similar degree of environmental consciousness as well as a comparable sensitivity towards climate change. In fact, since the early 1980s when climate change as a mainstream public issue emerged, people in both Italy and Germany have been considering climate change a very serious problem. What is more, both countries seem to have traditionally been among those EU member states with rather high levels of concern for the global and national environment. However, for most of the previous decade and over the early 2010s the relative urgency ascribed to climate change was, as compared to Germany, significantly less pronounced in the Italian context (although throughout the 1990s Italian respondents have often superseded Germans with regards to

levels of concern). What is more, Germans have felt and proved to be more informed about the issue. Generally, and as has already emerged from earlier surveys, Italian respondents, as compared to Germans, have manifested a less proactive-stance to environmental protection and a low propensity to feel personal responsible for tackling the issue. Germans, instead, have shown fairly high levels of perceived self-efficacy and were much more likely to have personally taken actions aimed at combating climate change.

All in all, these findings reflect many of the particular features that have been found to characterize both national contexts (Chapter 5) and are, furthermore, strongly in line with previous research on the barriers to pro-environmental behavior (Chapter 3). In fact, the above-cited differences between Italy and Germany seem to be substantially contingent upon a number of structural and contextual factors: A diffused lack of social and institutional trust, a disadvantageous political context and the pressing presence of a number of other social, economic and environmental concerns in Italy, and a fairly pro-environmental political elite that has given high priority to the problem of climate change, slightly higher levels of perceived institutional efficiency and a lower number of other pressing environmental problems in the case of Germany.

Also when looking at the results of the empirical study, it can be stated that the findings do, for the most part, confirm previous research on climate change communication and are fairly in line with what one would have expected on the basis of the country-specific differences set out in Chapter 5. Unsurprisingly, over the first half of the 2010s the German quality press paid, in terms of the number and proportion of articles dealing with climate change, significantly more attention to the problem than did the Italian papers. Furthermore, in both countries media coverage, while fairly corresponding with worldwide coverage trends, basically followed the same overall patterns and was often concentrated around climate-relevant events.

What has been said with regards to the different approach to environmental communication (Chapter 5) could also be confirmed, with the Italian newspapers showing a strong tendency to assume a local and "cultural" perspective when reporting on the environment. With regards to the German papers, instead, it has emerged that political topics played a rather important role. Generally, the themes that characterized climate change coverage in both countries fairly reflected cultural particularities.

For the most part, though, climate change coverage in the two countries was, in qualitative terms, fairly similar. The two major daily newspapers in Italy (*Corriere della Sera* and *La Repubblica*) and Germany (*Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung*) seemed to grant significantly more space to institutional actors such as political bodies and single heads of state, as well as to macro-level actors such as countries, continents and cities, than to individual civil society actors, such as citizens and consumers. Furthermore, all newspapers surveyed did refrain from climate skeptical discourse and adequately depicted the role individual civil society actors play in global climate change.

Generally, while differences with regards to the quantity of climate change coverage were most clear-cut on the country-level, in terms of the qualitative dimensions the opposite seemed to hold true, with differences being more pronounced along the line of the political orientation of the papers. This is especially true concerning journalistic tone and issue framing, as a closer reading of the articles has shown that center-left papers seemed to be more inclined to engage in moralizing discourse.

All in all, these findings seem to suggest that such a thing as a European "mainstream" climate change discourse might indeed exist. As discussed in earlier chapters, scholars have already pointed to the "relevance of the *transnational political realm of Europe*" (Olausson, 2009, p. 433) in media representation of climate change and of global environmental risk in general. However, it would certainly need more evidence from other EU member states in order to confirm this hypothesis.

Consistent with previous research on the interrelation of public opinion and media coverage (see Chapters 3 and 4), the Eurobarometer data seems to be reflected in and correspond with many of the quantitative and qualitative media coverage patterns detected through the empirical study. In fact, levels of concern seem to strongly coincide with media attention peaks in both countries: At the same time when concern about climate change was comparatively high in the Italian context (around the year 2000), *La Repubblica* manifested a series of significant coverage peaks (see Figure 13). The same holds true for the German context where a series of major peaks starting from the mid-2000s overlapped with a strong increase of awareness, concern and comparatively high levels of informedness. Thus, these findings are fairly in line with the agenda-setting theory mentioned earlier and studies such as

Sampei & Aoyagi-Usui (2009) who have shown that in Japan rising media coverage correlated with shifts in public opinion on climate change (see Chapter 4).

Be that as it may, the way climate change was "framed" in the German and Italian quality press did not seem to be unequivocally reflected in the public opinion data available. As the Eurobarometer reveals, in the first half of the current decade Italian and German survey respondents considered climate change a very serious issue, which seems to correspond with the fact that both the Italian and German newspapers depicted the issue as a serious and urgent problem, totally refraining from climate skeptical discourse. In both countries media accounts of climate change were, on the whole, fairly similar, in as much as all papers surveyed adequately depicted the role individual civil society actors play in causing and suffering from global climate change, clearly outlining where the responsibilities of individual citizens and consumers lie. However, and despite this almost identical climate change discourse, Italian and German respondents' views on individual and collective responsibility did considerably diverge. Germans were, on the whole and as compared to the Italian respondents, fairly more likely to feel personally responsible for tackling climate change.

What is more, the empirical study has shown that individual civil society actors were in all papers considerably underrepresented (even slightly more so in the German papers) and almost none of the articles analyzed, in both countries, could be considered to have a particular potential for triggering behavioral change. Nevertheless, the public opinion data reveals that Germans were fairly likely to have personally taken measures aimed at combating climate change. Furthermore, the tendency to "think local", a feature in climate change communication frequently considered to be effective for triggering behavioral change, was mainly confined to the Italian papers. Still Italian respondents were generally less likely to have personally taken action.

However, there have also been instances in which aspects of climate change coverage somewhat corresponded with the public opinion data available. As a closer reading of the articles has shown, both Italian papers, although generally correctly depicting the role of individuals in causing climate change, seemed to manifest a slight tendency to highlight and point the finger at institutional shortcomings, which can probably be considered as effective in augmenting the, as pointed out before, already diffused degree of distrust in public

authorities and the desire for institutional accountability, somewhat turning the focus away from individual responsibilities. This tendency seems to be fairly in line with the low propensity of Italian respondents to consider themselves personally responsible for tackling climate change (see above).

On the whole, these findings seem to strongly reinforce previous research on media effects and on the barriers to pro-environmental behavior. While the particular ways in which issues are "framed" are believed to resonate with the distinct "meaning making practices" (Carvalho & Burgess, 2005, p. 1458) of individual member of the audience, scholars have also pointed to the "social, institutional and practical barriers to public engagement" (Wolf & Moser, 2011, p. 561). In fact, as set out in Chapter 5, the political context in Germany seems to have been especially favorable for promoting and facilitating pro-environmental behavior, while there generally seems to exist a broad societal consensus about the importance of environmental protection. In Italy, on the other side, a rather strong propensity to social and institutional distrust seems to prevail, which certainly represents a social and political context which might generally drive people to view their actions as "pointless in isolation" (Lorenzoni & Pidgeon, 2006, p. 85). As previous research has shown, the degree to which individuals tend to have trust in others and in the capacity of public authorities seems to substantially influence the way people ultimately respond to the challenge of climate change.

Thus, rather than being influenced by media representations, the differences between Italian and German respondents with regard to their propensity to personally take action and to feel personally responsible for tackling climate change seem to be in large part based on structural differences, in terms of the political context and the, rather differently natured, civic cultures that seem to prevail in the two countries. However, and despite the minor role the media generally seem to play in this regard, it might be said that climate change reporting in the two Italian newspapers somewhat amplified and focused on the afore-mentioned structural barriers, thus, in part contributing to and reinforcing an already diffused stance of individual disengagement.

What certainly must also be kept in mind is the fact that in Italy the proportion of television viewers is especially high as compared to the share of newspaper readers (see Chapter 5). Hence, it might be assumed that newspaper representations of climate change are

on the whole much less influential in the Italian context. Generally, it must be noted that the comparatively low importance of newspapers in the Italian context reduces the comparability between the two cases analyzed. It, therefore, would have been interesting and reasonable to compare climate change coverage in German and Italian television, not least because, so far, comparatively few studies in the field have concentrated on television reporting. Be that as it may, limitations with regards to data availability and the time at disposition for carrying out this study have made such a choice infeasible.

As already brought up above, and despite the fact that all newspapers highlighted the importance of individuals for tackling climate change, almost none of the articles analyzed has been found to be overly engaging. Generally, climate change accounts that feature the perspective of individual civil society actors, that establish a direct link to personal experiences and that make concrete suggestions on what can be done to tackle the problem, have frequently been considered to be especially effective in triggering behavioral change.

In both countries individual civil society actors played only minor roles in climate change coverage, and also those articles dealing with individuals, such as citizens and consumers, did not truly contribute to helping people to "overcome" the barriers to pro-environmental behavior. In fact, concrete suggestion on what can be done without creating a major conflict with personal interests could only be found in one article, published by the German center-right paper *Frankfurter Allgemeine Zeitung*. While this might certainly not be an overly significant finding, considering the relatively low number of articles analyzed, it has nevertheless emerged, as pointed out before, that the center-right papers in both countries, seemed to assume a less moralizing stance when reporting on the issue. Generally, such a moralizing or accusing tone, might be rather counterproductive in triggering behavioral change, especially in those who are less engaged with climate change and with environmental issues in general.

Since relatively few articles in both countries featured the perspective of individuals or reported on the specific ways in which individual citizens can contribute to combating climate change, it might be assumed that in the two countries under study daily newspapers do not represent a major source for environmental education. On that account it would certainly be illuminating to gain a better understanding of where most Italians and Germans get and do not get information on ways to effectively tackle climate change from. As pointed

out before, in Italy knowledge about what types of actions are actually climate-friendly proved to be rather low (although many Italians obviously take climate-friendly measures on a daily basis, e.g. waste separation), while Germans seemed to be more informed in this regard. Thus, it would certainly be useful to analyze the content of widely diffused television programs in Italy and Germany with respect to contents on climate-friendly behavior. Be that as it may, since Germans have obviously been more involved with climate change (as the EB data and the quantity and proportion of climate change coverage suggest), it might also be assumed that they are generally more likely to intentionally seek information about climate change on the internet. Getting insight into individual information-gathering patterns with regards to climate change and the two countries under study would undoubtedly be an interesting task for future research.

Finally, it must be noted that climate change coverage in the Italian papers can generally be considered to have a rather strong potential for triggering behavioral change, at least on the basis of what previous research has found to be effective climate change communication (see above). As discussed before, the Italian papers fairly more often made reference to local actors such as Italian cities and regions and thus enhancing the issue's relevance for individual members of the audience and, furthermore, tended to assume a much broader perspective in their climate change reporting, incorporating the issue in a vast variety of different socially relevant themes. This is especially reflected in the specific topics that characterize climate change coverage in the Italian papers (the topics *Culture, Local sustainability* and *Food*) as well as in the amount of different newspaper sections in which climate change articles appeared.

But again, such diversified mentioning of climate change did not necessarily occur in a meaningful and overly engaging manner and, furthermore, cannot be effective when diffused via a medium that reaches only few segments of the population. What is more, and as the Eurobarometer suggests, in Italy other issues, such as the economic situation or air pollution, have been perceived as more pressing. Especially with regards to the latter, a useful measure would certainly be to invest in public education on the tight intersection of air quality issues and climate change,[94] maybe opening a window of opportunity for more

[94] Sergi, Giardullo, Kazepov and Maione (2016) have argued that, in view of the necessity of a convenient integration of air quality and climate change policies, air quality concerns might function as an effective driver for increasing the social acceptability of the latter.

awareness and meaningful individual action aimed at tackling both problems at the same time.

9 Bibliography

Agora Energiewende (2014). *The German Energiewende and its Climate Paradox*. Retrieved from: https://www.agora-energiewende.de/fileadmin/downloads/publikationen/Analysen/Trends_im_deutschen_Stromsektor/Analysis_Energiewende_Paradox_web_EN.pdf.

Aldrin, P. (2011). The Eurobarometer and the making of European opinion. In D. Gaxie, N. Hubé, & J. Rowel (Eds.), *Perceptions of Europe. A comparative sociology of European attitudes* (pp. 17−34). Colchester: ECPR Press. Chapter retrieved from: https://hal.inria.fr/file/index/docid/868867/filename/ALDRIN_-_The_eurobarometer_and_the_making_of_European_Opinion_2011_.pdf.

Anderson, A. (1997). *Media, culture and the environment*. London: UCL Press.

Anderson, A. (2009). Media, politics and climate change: Towards a new research agenda. *Sociology Compass*, 3(2), 166-182.

Anderson, A. (2014). *Media, Environment and the Network Society*. Basingstoke: Palgrave Macmillan.

Andresen, S., & Agrawala, S. (2002). Leaders, pushers and laggards in the making of the climate regime. *Global Environmental Change*, 12, 41-51.

Antilla, L. (2005). Climate of scepticism: US newspaper coverage of the science of climate change. *Global Environmental Change*, 15, 338-352.

Arrhenius, S. (1908). *Worlds in the making: The evolution of the universe.* New York: Harper & Brothers.

Austin, A., Barnard, J., & Hutcheon, N. (2015). *Media Consumption Forecasts 2015*. ZenithOptimedia. Retrieved from: http://zenithmedia.se/wp-content/uploads/2015/05/Media%20Consumption%20Forecasts%202015.pdf.

Balzer, F. et al. (2015). Environmental Trends in Germany: Data on the environment 2015. Dr. S. Schwermer et al., Federal Environment Agency Section I 1.5 “National and international Environmental Reporting” (Eds.). Federal Environment Agency. Retrieved from: https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/data_on_the_environment_2015.pdf.

Behrens, C. (2015, Nov 30). Die Macht der Chinesen. *Süddeutsche Zeitung*. Retrieved from: http://www.sueddeutsche.de/wissen/weltklimagipfel-in-paris-die-macht-der-chinesen-1.2756821.

Beltrame, L., Bucchi, M., & Mattè, B. (2012). Il cambiamento climatico come risorsa retorica e *masterframe*. Un'analisi di media e percezione pubblica in Italia. In P. Barrotta (Ed.), *Il rischio: aspetti tecnici, sociali, etici* (pp. 23-52). Roma: Armando Editore.

Benedetto, G. (Ed.) (2006). *Politica e ambiente: Bilancio della legislatura 2001-2006*. Milan: Edizioni Ambiente.

Biorcio, R. (2002). Italian green parties. In J. Barry & E. G. Frankland (Eds.), *International Encyclopedia of Environmental Politics* (pp.287-288). London and York: Routledge.

Bird, E. (2009). Tabloidization: What is it, and does it really matter? In B. Zelizer (Ed.), *The changing faces of journalism* (pp.40-50). New York: Routledge.

Birkland, T. A. (1998). Focusing events, mobilization, and agenda setting. *Journal of Public Policy*, 18(1), 53-74.

Bompan, E. (2014). *Il cambiamento climatico in Italia. Istituzioni scientifiche, politica e discorso pubblico (1988-2012)* (Doctoral dissertation). Retrieved from: http:// amsdottorato.unibo.it/6471/.

Bord, Richard J., Fisher, A., & O'Connor, R. E. (1998). Public perceptions of global warming: United States and international perspectives. *Climate Research*, 11, 75–84.

Bostrom, A., Granger Morgan, M., Fischhoff, B., & Read, D. (1994). What do people know about global climate change? 1. mental models. *Risk Analysis*, 14(6), 959–970.

Brandi, C. (2012). EU climate leadership in Copenhagen and beyond. In S. Gänzle, S. Grimm & D. Makhan (Eds.), *The European Union and global development: an enlightened superpower in the making?* (pp. 175-189). Houndmills: Palgrave MacMillan.

Braun, M. (2016). Europeanization of environmental policy in the new Europe: Beyond conditionality. London and New York: Routledge.

Brechin, S. R. (2003). Comparative public opinion and knowledge on global climatic change and the Kyoto Protocol: The U.S. versus the world? *International Journal of Sociology and Social Policy*, 23(10), 106-134.

Brossard, D., Shanahan, J., & McComas, K. (2004). Are issue-cycles culturally constructed? A comparison of French and American coverage of global climate change. *Mass Communication & Society*, 7(3), 359-377.

Bundestagswahlleiter (n.d.). *Europawahl 2014*. Retrieved from: https://www.bundeswahlleiter.de/europawahlen/2014/ergebnisse.html.

Buonanno, L., & Nugent, N. (2013). *Policies and Policy Processes of the European Union*. Basingstoke: Palgrave McMillan.

Burck, J., Marten, F., & Bals, C. (2014). The Climate Change Performance Index Results 2015. Available at: https://germanwatch.org/en/9472.

Boyce, T., & Lewis, J. (Eds.). (2009). *Climate Change and the Media*. New York: Peter Lang.

Boykoff, M. T. (2007). From convergence to contention: United States mass media representations of anthropogenic climate change science. *Transactions of the Institute of British Geographers*, 32(4), 477-489.

Boykoff, M. T. (2011). *Who speaks for the climate? Making sense of media reporting on climate Change*. Cambridge: Cambridge University Press.

Boykoff, M. T., & Boykoff, J. M. (2007). Climate change and journalistic norms: A case-study of US mass-media coverage. *Geoforum*, 38, 1190-1204.

Boykoff, M. T., Goodman, M., & Curtis, I. (2010). Cultural politics of climate change: Interactions in the spaces of everyday. In M. T. Boykoff (Ed.), *The politics of climate change: A survey* (pp. 136-154). London: Routledge.

Boykoff, M. T., & Roberts, T. J. (2007). Media coverage of climate change: Current trends, strengths, weaknesses. In: Human Development Report 2007/2008. Human Development Report Office.

Boykoff, M. T., & Yulsman, T. (2013). Political economy, media, and climate change: sinews of modern life. *WIREs Climate Change*, 4(5), 359-371.

Cacciatore, M. A., Scheufele, D. A., & Iyengar, S. (2016). The end of framing as we know it . . . and the future of media effects. *Mass Communication and Society*, 19, 7-23.

Caple, H., & Bednarek, M. (2013). Delving into the Discourse: Approaches to News Values in Journalism Studies and Beyond. Working paper. Oxford: Reuters Institute for the Study of Journalism, University of Oxford.

Capstick, S., Whitmarsh, L., Poortinga, W., Pidgeon, N. F., & Upham, P. (2015). International trends in public perceptions of climate change over the past quarter century. *WIREs Climate Change* 6(1), 35-61.

Carvalho, A. (2007). Ideological cultures and media discourses on scientific knowledge: re-reading news on climate change. *Public Understanding of Science*, 16, 223-243.

Carvalho, A. (2010). Media(ted) discourses and climate change: a focus on political subjectivity and (dis)engagement. *WIREs Climate Change*, 1(2), 172-179.

Carvalho, A., & Burgess, J. (2005). Cultural Circuits of Climate Change in U.K. Broadsheet Newspapers, 1985–2003. *Risk Analysis*, 25(6), 1457-1469.

Cazzullo, A. (2013, Jan 10). La scomparsa degli ecologisti. *Corriere della Sera*. Retrieved from: http://www.corriere.it/editoriali/13_gennaio_10/cazzullo-scomparsa-ecologisti-verdi_bfac623e-5aeb-11e2-b99a-09ab2491ad91.shtml.

Cianciullo, A. (2013, Sept 17). Italia, troppe auto: 606 ogni 1000 abitanti, e la media nei paesi europei è di 473. *La Repubblica*.
Retrieved from: http://www.repubblica.it/ambiente/2013/09/17/news/italia_606_auto_ogni_100_abitanti_la_media_dei_paesi_europei_di_473-66703028/.

Close, C., & Delwit, P. (2016). Green parties and elections. In E. van Haute (Ed.), *Green Parties in Europe* (pp. 241-264). London and New York: Routledge.

Corbett, J. B., & Durfee, J. L. (2004). Testing public (un)certainty of science media representations of global warming. *Science Communication*, 26(2), 129-151.

Corfee-Morlot, J., Maslin, M., & Burgess, J. (2007). Global warming in the public sphere. *Philosophical Transactions of the Royal Society A,* 365, 2741-2776.

Crona, B., Wutich, A., Brewis, A., & Gartin, M. (2013). Perceptions of climate change: Linking local and global perceptions through a cultural knowledge approach. *Climatic Change*, 119, 519–531.

Daly, M., Gifford, L., Luedecke, G., McAllister, L., Nacu-Schmidt, A., Andrews, K., & Boykoff, M. (2016). *World Newspaper Coverage of Climate Change or Global Warming, 2004-2016*. Center for Science and Technology Policy Research, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Web. Retrieved from: http://sciencepolicy.colorado.edu/media_coverage.

Della Seta, R. (2000). *La difesa dell'ambiente in Italia: Storia e cultura del movimento ecologista.* Milano: FrancoAngeli.

Delreux, T. (2013). The EU as an actor in global environmental politics. In A. Jordan and C. Adelle (Eds.), *Environmental Policy in the EU: Actors, Institutions and Processes* (pp. 13-31). London and New York: Routledge.

Dente, B., & Lewanski, R. (2002). Italy. In H. Weidner & M. Jänicke (Eds.), *Capacity building in national environmental policy: A comparative study of 17 countries* (pp. 261-285). Berlin and Heidelberg: Springer Verlag.

Der Spiegel. (1988, Dec 12). *Geprügelter Planet*. Issue 50/1988. Retrieved from: http://www.spiegel.de/spiegel/print/d-13531408.html.

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.

Dispensa, J. M., & Brulle, R. J. (2003). Media's social construction of environmental issues: focus on global warming – a comparative study. *International Journal of Sociology and Social Policy*, 23(10), 74-105.

Dunlap, R. E. & Scarce, R. (1991). The polls-poll trends: Environmental problems and protection. *Public Opinion Quarterly*, 55, 651-658.

Dunlap, R. E. (1995). Public opinion and environmental policy. In J. P. Lester (Ed.), *Environmental politics and policy: Theories and evidence* (pp. 63-114). Durham and London: Duke University Press.

Dunlap, R. E. (1998). Lay perceptions of global risk: Public views of global warming in cross-national context. *International Sociology*, 13(4), 473-498.

Earle, T.C., Siegrist, M., & Gutscher, H. (2007). Trust, risk perception, and the TCC Model of Cooperation. In M. Siegrist, T.C. Earle, & H. Gutscher (Eds.), *Trust in cooperative risk management: Uncertainty and scepticism in the public mind* (pp. 1-49). London: Earthscan.

Entman, R. M. (1993). Framing: Towards clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51-58.

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.3-24). New York and London: Routledge.

Esslinger, D. (2013, Oct 6). Wo bleiben die Zumutungen? *Süddeutsche Zeitung*. Retrieved from: http://www.sueddeutsche.de/politik/klimapolitik-wo-bleiben-die-zumutungen-1.1787481.

European Commission (2015, Nov 25). *Global growth in CO2 emissions stagnates*. Retrieved from: https://ec.europa.eu/jrc/en/news/global-growth-co2-emissions-stagnates.

European Commission (latest update 2016). *Legal enforcement-Statistics on environmental infringements*. Retrieved from: http://ec.europa.eu/environment/legal/law/statistics.htm.

European Commission (latest update 2017). *2020 climate & energy package*. Retrieved from: http://ec.europa.eu/clima/policies/strategies/2020/.

European Omnibus Survey, EOS (1977). *Science and European public opinion*. Special Eurobarometer, requested by the Directorate-General for Research, Science and Education of the Commission of the European Communities. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/67842.

European Omnibus Survey, EOS (1982). *The European and their environment*. Special Eurobarometer, requested by the Directorate-General for the Environment in the Commission of the European Communities. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/53943.

European Omnibus Survey, EOS (1988). *Les Europeens et l'environnement en 1988*. Special Eurobarometer, requested by the Directorate-General for the Environment in the Commission of the European Communities. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/53978.

European Opinion Research Group, EORG (2002). *The attitudes of Europeans towards the environment*. Eurobarometer 58.0 for Directorate-General Environment– survey managed and organized by Directorate-General Press and Communication

"Public Opinion Analysis". Retrieved from: http://ec.europa.eu/COMMFrontOffice/PublicOpinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/313/p/6.

European Parliament (n.d.). *Results of the 2014 European elections*. Retrieved from: http://www.europarl.europa.eu/elections2014-results/en/country-results-it-2014.html.

Eurostat (2016, April). *Culture statistics - cultural participation*. Retrieved from: http://ec.europa.eu/eurostat/statistics-explained/index.php/Culture_statistics_-_cultural_participation.

Eurostat (2016, June). *Greenhouse gas emission statistics*. Retrieved from: http://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics.

Eurostat (2016, July). *Renewable energy statistics*. Data source code: t2020_31. Retrieved from: http://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics.

Eurostat (latest update 2017). *Gross domestic product at market prices*. Retrieved from: tec00001.

Farnesina (2007, May 5). *The Italian Economy*. Retrieved from: http://www.esteri.it/mae/en/ministero/servizi/benvenuti_in_italia/conoscere_italia/economia.html.

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Fischer, D. (2014). Climate coverage soars in 2013, spurred by energy, weather. *The Daily Climate*. Retrieved from: http://www.dailyclimate.org/tdc-newsroom/2014/01/2013-climate-change-reporting.

Fischer, T. B. (2009). The EU and its regulatory role in environmental policy and assessment. Paper prepared for the conference *The Evolution of Integration in Europe 20 Years after the Fall of the Berlin Wall* held at the Viessmann Academy, Viessmann Corporation, Allendorf a.d. Eder, Hessen, Germany, October 11–14, 2009.

Fortis, M., & Sartori, A. (2016). Food & wine: Quality, tradition and innovation. In M. Fortis (Ed.), *The Pillars of the Italian Economy: Manufacturing, Food & Wine, Tourism* (pp. 283-319). Cham, Switzerland: Springer International.

Franz, W. E. (1997). The development of an international agenda for climate change: Connecting science to policy. Discussion Paper E-97-07, Kennedy School of Government, Harvard University.

Gamson, W. A., & Modigliani, A. (1989). Media discourse and public opinion on nuclear power: A constructionist approach. *American Journal of Sociology*, 95(1), 1-37.

Germani, A. R., Pergolizzi, A., & Reganati, F. (2015). Illegal trafficking and unsustainable waste management in Italy: Evidence at the regional level. *Journal of Security and Sustainability Issues*, 4(4), 369-389.

Giardullo, P., & Lorenzet, A. (2016). Techno-scientific issues in the public sphere (TIPS). *European Association for the Study of Science and Technology*, *EASST Review,* 35(4), 14-17.

Giardullo, P., & Neresini, F. (2015). La governance della produzione alimentare nel dibattito pubblico italiano. *Amministrare rivista dell'Istituto Italiano di Scienza dell'Amministrazione*, 45, 205-234.

Giddens, A. (2008). The politics of climate change: National responses to the challenge of global warming. *Policy Network Paper.*

Globescan. (2015). *Wealthy countries less concerned about climate change: Global poll.* Retrieved from: http://www.globescan.com/news-and-analysis/press-releases/press-releases-2015/367-wealthy-countries-less-concerned-about-climate-change-global-poll.html.

Gottlieb, R. (1993). Reconstructing environmentalism: Complex movements, diverse roots." *Environmental History Review*, 17(4), 1-19.

Grundmann, R., & Krishnamurthy, R. (2010). The discourse of climate change: A corpus-based approach. *Critical Approaches to Discourse Analysis Across Disciplines*, 4, 113-133.

Grundmann, R., Rhomberg, M., & Stehr, N. (2012). Der Klimawandel und die Rolle der Sozialwissenschaften. In H. Eigner and M. Schmid (Eds.), *Jenseits traditioneller Wissenschaft? Zur Rolle von Wissenschaft in einer vorsorgenden Gesellschaft* (pp. 95 - 110). München: Oekom.

Hager, C. (2016). The grassroots origins of the German energy transition. In C. Hager & C. H. Stefes (Eds.), *Germany's Energy Transition: A Comparative Perspective* (pp. 1-26). New York: Palgrave Macmillan.

Hall, S. (1997). Introduction. In S. Hall (Ed.), *Representation: Cultural representation and signifying practices* (pp. 1-14). London: Sage.

Hallin, D. C., & Mancini, P. (2004). *Comparing media systems: Three models of media and politics*. Cambridge: Cambridge University Press.

Happer, C., & Philo, G. (2013). The role of the media in the construction of public belief and social change. *Journal of Social and Political Psychology*, 1(1), 321-336.

Happer, C., & Philo, G. (2016). New approaches to understanding the role of the news media in the formation of public attitudes and behaviours on climate change. *European Journal of Communication*, 31(2), 136-151.

Hart D.M, & Victor, D. G. (1993). Scientific elites and the making of US policy for climate change research, 1957–74. *Social Studies of Science*, 23, 643-680.

Hart, P. S., & Nisbet, E. C. (2012). Boomerang Effects in Science Communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication Research*, 39(6), 701-723.

Hecht, A.D., & Tirpak, D. (1995). Framework agreement on climate change: A scientific and policy history. *Climatic Change*, 29(4), 371- 402.

Hedemann-Robinson, M. (2015). *Enforcement of European Union environmental law: Legal issues and challenges*. 2nd edition. London and New York: Routledge.

Hilgartner, S., & Bosk, C. L. (1988). The rise and fall of social problems: A public arenas model. *American Journal of Sociology,* 94(1), 53-78.

Hirsch, T. (2016). *The Role of Alliances in International Climate Policy after Paris*. Perspective/Friedrich-Ebert-Stiftung, Global Policy and Development, Berlin. Retrieved from: http://library.fes.de/pdf-files/iez/12689.pdf.

Holt, D., & Barkemeyer, R. (2012). Media coverage of sustainable development issues–Attention cycles or punctuated equilibrium? *Sustainable Development*, 20, 1-17.

Höpner, M., & Jurczyk, B. (2015). How the Eurobarometer blurs the line between research and propaganda. MPIfG Discussion Paper 15/6. Max Planck Institute for the Study of Societies, Cologne. Retrieved from: http://www.mpifg.de/pu/mpifg_dp/dp15-6.pdf.

Howe, J. P. (2014). *Behind the Curve: Science and the Politics of Global Warming*. Seattle: Washington University Press.

Huang, H. (2016). Media use, environmental beliefs, self-efficacy, and pro-environmental behavior. *Journal of Business Research*, 69, 2206-2212.

Hulme, M. (2009). *Why we disagree about climate change: Understanding controversy, inaction and opportunity*. Cambridge: Cambridge University Press.

IFAD, International Fund for Agricultural Development (2016). *The untold story: Climate change sinks below the headlines*. Retrieved from: https://www.ifad.org/documents/10180/6173b0cf-3423-408c-aac6-e6da78f01239.

Inglehart, R. F. (2008). Changing values among Western publics from 1970 to 2006. *West European* Politics, 31(1–2), 130-146.

INRA (Europe)-ECO (1992). *Europeans and the environment in 1992*. Eurobarometer 37.0 for the European Commission Directorate-General Environment, Nuclear Safety and Civil Protection, Unit XI/C/4 "Communication and Training", Commission of the European Communities. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/54019.

INRA (Europe)-ECO (1995). *Europeans and the environment in 1995*. Eurobarometer 43.1 bis for the European Commission Directorate-General Environment, Nuclear Safety and Civil Protection, Unit XI/A/3 "Information and Communication", Commission of the European Communities. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/54040.

IPCC (2014). Climate Change 2014: Impacts, adaptation and vulnerability. Part A: Global and sectoral aspects. Working Group II contribution to the fifth assessment report of the Intergovernmental Panel on Clime Change. Cambridge, UK and New York: Cambridge University Press.

Istat (2016). *Quality agro-food products PDO, PGI AND TSG:Year 2014*. Retrieved from: http://www.istat.it/en/files/2016/03/EN_DOP_2014.pdf?title=Quality+agro-food+products+-+25+Mar+2016+-+Full+text.pdf.

Jordan, A. (2005). Introduction: European Union environmental policy - Actors, institutions and policy processes. In A. Jordan (Ed.), *Environmental Policy in the European*

Union: Actors, Institutions, and Processes (1-18). London and Sterling, VA: Earthscan.

Kahan, D. M. (2006). Cultural cognition and public policy. *Faculty Scholarship Series*. Paper 103, http://digitalcommons.law.yale.edu/fss_papers/103.

Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research*, 14(2), 147-174.

Kanning, T. (2015, Nov 28). Geld verdienen mit dem Klimaschutz. *Frankfurter Allgemeine Zeitung*. Retrieved from: http://www.faz.net/aktuell/finanzen/fonds-mehr/aktien-und-fonds-zum-klimaschutz-13936243.html.

Keating, D. (2014, Dec 12). Italy's environment policy: The Italian government has a lot of work to do to improve its environmental record. *Politico*. Retrieved from: http://www.politico.eu/article/italys-environment-policy/.

Kempton, W. (1991). Lay perspectives on global climate change. *Global Environmental Change*, 1(3), 183-208.

Ki-moon, B. (2015, Dec 12). *Secretary-General's remarks at closing of COP21.* Retrieved *from:* https://www.un.org/sg/en/content/sg/statement/2015-12-12/secretary-generals-remarks-closing-cop21.

Knill, C., & Liefferink, D. (2007). Environmental politics in the European Union: Policy-making, implementation and patterns of multi-level governance. Manchester: Manchester University Press.

Knill, C., & Liefferink, D. (2013). The establishment of EU environmental policy. In A. Jordan and C. Adelle (Eds.), *Environmental Policy in the EU: Actors, Institutions and Processes* (pp. 13-31). London and New York: Routledge.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239-260.

Kreft, S., Eckstein, D., Dorsch, L., & Fischer, L. (2015). *Global Climate Risk Index 2016: Who suffers most from extreme weather events? Weather-related loss events in 2014 and 1995 to 2014*. Germanwatch e.V. Retrieved from: https://germanwatch.org/fr/download/13503.pdf.

La Repubblica (2015, Nov 26). Papa in Kenya: "Il nome di Dio non giustifichi mai l'odio". Retrieved from: http://www.repubblica.it/vaticano/2015/11/26/news/papa_in_kenya-128180199/.

La Repubblica (2015, Dec 2). Clima: "Il 50% delle emissioni globali dipende dal 10% prodotto dal mondo ricco. Retrieved from: http://www.repubblica.it/solidarieta/cooperazione/2015/12/02/news/clima-128626249/.

Leas, E. C., Althouse, B. M., Dredze, M., Obradovich, N., Fowler, J. H., Noar, S. M.,...Ayers, J. W. (2016). Big data sensors of organic advocacy: The case of Leonardo DiCaprio and climate change." *PLoS ONE* 11(8): e0159885. doi:10.1371/journal.pone.0159885.

Leiserowitz, A. A. (2004). Day after tomorrow: Study of climate change risk perception. *Environment: Science and Policy for Sustainable Development*, 46(9), 22-39.

Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change*, 77, 45-72.

Levy, D. L., & Egan, D. (2003). A neo-Gramscian approach to corporate political strategy: Conflict and accommodation in the climate change negotiations." *Journal of Management Studies*, 40(4), 803-829.

Liverman, D. M. (1999). Geography and the global environment. *Annals of the Association of American Geographers*, 89(1), 107-120.

Lorenzoni, I., & Hulme, M. (2009). Believing is seeing: Laypeople's views of future socioeconomic and climate change in England and in Italy. *Public Understanding of Science*, 18, 383-400.

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, 445-459.

Lorenzoni, I., & Pidgeon N. F. (2006). Public views on climate change: European and USA perspectives. *Climatic Change*, 77, 73-95.

Mahoney, J., & Rueschemeyer, D. (2003). Comparative historical analysis: Achievements and Agendas. In J. Mahoney & D. Rueschemeyer (Eds.), *Comparative historical analysis in the social sciences* (pp. 3-40). Cambridge: Cambridge University Press.

Marx, M. (2014). Welthunger und Ernährungssicherung im Spiegel der Presse: Die Medienwirklichkeit eines Massenphänomens. *Berliner Geographische Blätter*, Nr 7,

Prof. Dr. H. Kreutzmann (Ed.), Centre for Development Studies (ZELF), Institute of Geographical Sciences, Freie Universität Berlin.

Mazur, A. (1981). Media coverage and public opinion on scientific controversies. *Journal of Communication*, 31(2), 106-115.

Mazur, A. (1998). Global environmental change in the news 1987-90 vs 1992-6. *International Sociology*, 13(4), 457-472.

McComas, K., & Shanahan, J. (1999). Telling stories about global climate change: Measuring the impact of narratives on issue cycles. *Communication Research*, 26(1), 30-57.

McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *Public Opinion Quarterly,* 36(2), 176-187.

McCombs, M. E. (2000). *The agenda-setting role of the mass media in the shaping of public opinion*. Unpublished. Retrieved from: http://www.infoamerica.org/documentos_pdf/mccombs01.pdf.

McCombs, M. E. (2004). *Setting the Agenda: The Mass Media and Public Opinion*. Malden, MA: Blackwell.

McQuail, D. (2010). *McQuail's mass communication theory*. 6th edition. London: Sage.

Moser, S. C. (2010). Communicating climate change: history, challenges, process and future directions. *WIREs Climate Change*, 1, 31-53.

Moser, S. C., & Dilling, L. (2011). Communicating climate change: Closing the science‐action gap. In J. S. Dryzek, R. B. Norgaard, & D. Schlosberg (Eds.), *The Oxford Handbook of Climate Change and Society* (pp. 161-176). Oxford and New York: Oxford University Press.

Mudge, F.B. (1997). The development of the greenhouse theory of global climate change from Victorian times. *Weather*, 52, 13-17.

Müller-Jung, J. (2011, Dec 16). Die Gasblasen im Klimakomplex. *Frankfurter Allgemeine Zeitung*. Retrieved from: http://www.faz.net/aktuell/wissen/klima/methanaustritt-vor-sibiriens-kueste-die-gasblasen-im-klimakomplex-11566110.html.

Neresini, F., & Lorenzet, A. (2016). Can media monitoring be a proxy for public opinion about technoscientific controversies? The case of the Italian public debate on nuclear power. *Public Understanding of Science*, 25(2), 171-185.

Nerlich, B., Koteyko, N., & Brown, B. (2010). Theory and language of climate change communication. *WIREs Climate Change*, 1, 97–110.

Neverla, I., & Schäfer, M. S. (2012). Einleitung: Der Klimawandel und das „Medien-Klima". In I. Neverla & M. S. Schäfer (Eds.), *Das Medien-Klima: Fragen und Befunde der kommunikationswissenschaftlichen Klimaforschung* (pp. 9-28). Wiesbaden: Springer VS.

Neverla, I., & Taddicken, M. (2012). Der Klimawandel aus Rezipientensicht: Relevanz und Forschungsstand. In I. Neverla & M. S. Schäfer (Eds.), *Das Medien-Klima: Fragen und Befunde der kommunikationswissenschaftlichen Klimaforschung* (pp. 215-232). Wiesbaden: Springer VS.

Neverla, I., & Trümper, S. (2012). Journalisten und das Thema Klimawandel: Typik und Probleme der journalistischen Konstruktionen von Klimawandel. In I. Neverla & M. S. Schäfer (Eds.), *Das Medien-Klima: Fragen und Befunde der kommunikationswissenschaftlichen Klimaforschung* (pp. 95-120). Wiesbaden: Springer VS.

Newman, N. (2011). *Mainstream media and the distribution of news in the age of social discovery*. Reuters Institute for the study of Journalism. Retrieved from: http://reutersinstitute.politics.ox.ac.uk/publication/mainstream-media-and-distribution-news-age-social-discovery.

Nisbet, M. C., & Myers, T. (2007). The polls-trends: Twenty years of public opinion about global warming. *Public Opinion Quarterly*, 71(3), 444-470.

Nofri, S. (2013). *Cultures of environmental communication: A multilingual comparison*. Wiesbaden: Springer VS.

Oberthür, S., Jørgensen, K. E., & Shahin, J. (2011). Introduction: Assessing the EU's performance in international institutions - Conceptual framework and core findings. *Journal of European Integration*, 33(6), 599-620.

OECD (2003). OECD Environmental Performance Review: Italy 2002, OECD Publishing. Retrieved from: http://www.oecd-ilibrary.org/environment/oecd-environmental-performance-reviews_19900090.

OECD (2012). OECD Environmental Performance Review: Germany 2012, OECD Publishing. Retrieved from: http://www.oecd.org/environment/country-reviews/oecd-environmental-performance-reviews-germany-2012-9789264169302-en.htm.

OECD (2013). OECD Environmental Performance Review: Italy 2013, OECD Publishing. Retrieved from: http://www.oecd.org/environment/country-reviews/oecd-environmental-performance-reviews-italy-2013-9789264186378-en.htm.

Olausson, U. (2009). Global warming-global responsibility? Media frames of collective action and scientific certainty. *Public Understanding of Science*, 18, 421-436.

Osborn, D., & Bigg, T. (2009). *Earth Summit II: Outcomes and analysis*. First published in 1998. London: Earthscan.

Painter, J. (2010). Summoned by science: Reporting climate change at Copenhagen and beyond. *Reuters Institute for the Study of Journalism*, University of Oxford.

Painter, J. (2013). *Climate change in the media: Reporting risk and uncertainty*. Oxford: I. B. Tauris with Reuters Institute for the Study of Journalism.

Pelham, B. W. (2009, April 22). *Awareness, opinions about global warming vary worldwide*. Retrieved from: http://www.gallup.com/poll/117772/awareness-opinions-global-warming-vary-worldwide.aspx.

Peters, H. P. (2005). From information to attitudes? Thoughts on the relationship between knowledge about science and technology and attitudes toward technologies. In M. Dierkes & C. von Grote (Eds.), *Between Understanding and Trust: The Public, Science and Technology* (pp. 182-196). London and New York: Routledge, Taylor & Francis e-Library.

Pongiglione, F., & Cherlet J. (2015). The social and behavioral dimensions of climate change: Fundamental but disregarded? *Journal for General Philosophy of Science*, 46(2), 383-391.

Poortinga, W., Spence, A., Whitmarsh, L., Capstick, S., & Pidgeon, N. F. (2011). Uncertain climate: An investigation into public scepticism about anthropogenic climate change. *Global Environmental Change*, 21(3), 1015–1024.

Pozzo, B. (2012). The need for a consistent renewable energy policy in Italy. In M. Peeters, M. Stallworthy & J. de Cendra de Larragàn (Eds.), *Climate law in EU member states:*

Towards national legislation for climate protection (pp. 294-312). Cheltenham, UK: Edward Elgar.

Przeworski, A., & Teune, H. (1970). *The logic of comparative inquiry*. New York, NY: John Wiley.

RAP (2015): Report on the German power system. Version 1.0. Study commissioned by Agora Energiewende. Retrieved from: https://www.agora-energiewende.de/fileadmin/downloads/publikationen/CountryProfiles/Agora_CP_Germany_web.pdf.

Ratter, B. M. W., Philipp, K. H. I., & von Storch, H. (2012). Between hype and decline: recent trends in public perception of climate change. *Environmental Science & Policy*, 18, 3-8.

Reynolds, T. W., Bostrom, A., Read, D., & Granger Morgan, M. (2010). Now what do people know about global climate change? Survey studies of educated laypeople. *Risk Analysis*, 30(10), 1520-1538.

Rhomberg, M. (2012). Wissenschaftliche und politische Akteure in der Klimadebatte. In I. Neverla & M. S. Schäfer (Eds.), *Das Medien-Klima: Fragen und Befunde der kommunikationswissenschaftlichen Klimaforschung* (pp. 29-46). Wiesbaden: Springer VS.

Sampei, Y., & Aoyagi-Usui, M. (2009). Mass-media coverage, its influence on public awareness of climate-change issues, and implications for Japan's national campaign to reduce greenhouse gas emissions. *Global Environmental Change,* 19, 203-212.

Saporiti, C. (2013, Sept 9). Le 10 città guida per i progetti ambientali: nessuna italiana. *Corriere della Sera*. Retrieved from: http://www.corriere.it/ambiente/13_settembre_09/le-dieci-citta-climate-leader_bd19ed46-192e-11e3-965e-2853ac612ccd.shtml.

Schäfer, M. S., Ivanova, A., & Schmidt, A. (2012). Issue-Attention: Mediale Aufmerksamkeit für den Klimawandel in 26 Ländern. In I. Neverla & M. S. Schäfer (Eds.), *Das Medien-Klima: Fragen und Befunde der kommunikationswissenschaftlichen Klimaforschung* (pp. 121-142). Wiesbaden: Springer VS.

Scheufele, D. A. (2000). Agenda-setting, priming, and framing revisited: Another look at cognitive effects of political communication. *Mass Communication & Society*, 3(2-3), 297-316.

Scheufele, D. A., & Tewksbury, D. (2007). Framing, agenda setting, and priming: The evolution of three media effects models. *Journal of Communication*, 57, 9–20.

Schmidt, A. (2012). Bewegungen, Gegenbewegungen, NGOs: Klimakommunikation zivilgesellschaftlicher Akteure. In I. Neverla & M. S. Schäfer (Eds.), *Das Medien-Klima: Fragen und Befunde der kommunikationswissenschaftlichen Klimaforschung* (pp. 69-94). Wiesbaden: Springer VS.

Schmidt, A., Ivanova, A., & Schäfer, M. S. (2013). Media attention for climate change around the world: A comparative analysis of newspaper coverage in 27 countries. *Global Environmental Change*, 23, 1233-1248.

Schreurs, M. A., Clark, W. C., Dickson, N. M., & Jäger, J. (2001). Issue attention, framing, and actors: An analysis of patterns across arenas. In The Social Learning Group (Ed.), *A Comparative History of Social Responses to Climate Change, Ozone Depletion, and Acid Rain* (pp. 349-364). Cambridge, MA: MIT Press.

Science Communication Unit, University of the West of England, Bristol (2014). S*cience for Environment Policy Future Brief: Public risk perception and environmental policy*. Report produced for the European Commission DG Environment, September 2014. Available at: http://ec.europa.eu/science-environment-policy.

Sergi, V., Giardullo, P., Kazepov, Y., & Maione, M. (2016). Can concern for air quality improvement increase the acceptability of climate change mitigation policies? In W. L. Filho, U. M. Azeiteiro, & F. Alves (Eds.), *Climate change and health: Improving resilience and reducing risks* (pp. 89-106). Cham: Springer International Publishing.

Shwartz, M. (2010, March 13). *Majority of Americans continue to believe that global warming is real*. Retrieved from: https://woods.stanford.edu/sites/default/files/files/Krosnick-20090312.pdf.

Stamm, K. R., Clark F., & Reynolds Eblacas P. (2000). Mass communication and public understanding of environmental problems: The case of global warming. *Public Understanding of Science*, 9(3), 219-237.

Stefes, C. H. (2016). Conclusion: Lessons from the German *Energiewende.* In C. Hager & C. H. Stefes (Eds.), *Germany's Energy Transition: A Comparative Perspective* (pp. 185-194). New York: Palgrave Macmillan.

Taddicken, M. (2013). Climate change from the user's perspective: The impact of mass media and internet use and individual and moderating variables on knowledge and attitudes. *Journal of Media Psychology*, 25(1), 39–52.

Takahashi, B., Tandoc Jr, E. C. (2016). Media sources, credibility, and perceptions of science: Learning about how people learn about science. *Public Understanding of Science*, 25(6), 674–690.

Technische Universität Dortmund, Institute of Spatial Planning IRPUDR (2012). *Overall impacts derived from 26 impact indicators, overall adaptive capacity from 15 individual indicators, and overall vulnerability from a combination of overall impacts and adaptive capacity*. Published by European Environment Agency. Retrieved from: http://www.eea.europa.eu/data-and-maps/figures/potential-aggregate-impact-adaptive-capacity.

TNS Opinion & Social (2008). *Attitudes of European citizens towards the environment*. Special Eurobarometer 295/Wave 68.2, requested by Directorate General Environment and coordinated by Directorate General Communication, European Commission. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/54710.

TNS Opinion & Social (2008). *Europeans' attitudes towards climate change*. Special Eurobarometer 300 /Wave 69.2, requested by the European Commission and the European Parliament and coordinated by the Directorate-General for Communication of the European Commission. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/54968.

TNS Opinion & Social (2009). *Europeans' attitudes towards climate change*. Special Eurobarometer 322 / Wave 72.1, requested and coordinated by the Directorate-General for Communication ("Research and Political Analysis" Unit). Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/703/p/3.

TNS Opinion & Social (2011). *Climate change*. Special Eurobarometer 372 /Wave EB75.4, requested by the Directorate-General Climate action and coordinated by Directorate-General for Communication (DG COMM "Research and Speechwriting" Unit).

Retrieved from: http://ec.europa.eu/COMMFrontOffice/PublicOpinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/1007/p/2.

TNS Opinion & Social (2013). *Climate change*. Special Eurobarometer 409 /Wave EB80.2, requested by the European Commission, Directorate-General for Climate Action (DG CLIMA) and co-ordinated by the Directorate-General for Communication. Retrieved from: http://ec.europa.eu/COMMFrontOffice/PublicOpinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/1084.

TNS Opinion & Social (2014). *Attitudes of European citizens towards the environment*. Special Eurobarometer 416 / Wave EB81.3, requested by the European Commission, Directorate-General for Environment (DG ENV) and co-ordinated by the Directorate-General for Communication. Retrieved from: http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/57874.

TNS Opinion & Social (2015). *Climate change*. Special Eurobarometer 435 /Wave EB83.4, requested by the European Commission, Directorate-General for Climate Action and co-ordinated by the Directorate-General for Communication. Retrieved from: http://ec.europa.eu/COMMFrontOffice/PublicOpinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/2060.

Traverso Saibante, C. (2013, Sept 17). Scozia: avanti tutta con l'energia dalle maree. *Corriere della Sera.* Retrieved from: http://www.corriere.it/ambiente/13_settembre_18/scozia-maree-centrale_2f9a2d0e-1f97-11e3-9636-b0708204026a.shtml.

Trumbo, C. (1996). Constructing climate change: claims and frames in US news coverage of an environmental issue. *Public Understanding of Science*, 5, 269-283.

Uekötter, F. (2014). *The greenest nation? A new history of German environmentalism*. Cambridge, MA: MIT Press.

UNFCCC, United Nations Framework Convention on Climate Change (n.d.). *Paris Agreement - Status of Ratification*. Retrieved from: http://unfccc.int/paris_agreement/items/9444.php.

Ungar, S. (1992). The rise and (relative) decline of global warming as a social problem. *The Sociological Quarterly*, 33, 483-50.

Ungar, S. (1998). Bringing the issue back in: Comparing the marketability of the ozone hole and global warming. *Social Problems*, 45(4), 510-527.

Ungar, S. (2000). Knowledge, ignorance and the popular culture: climate change versus the ozone hole. *Public Understanding of Science*, 9, 297-312.

van Dijk, T. A. (1995). Power and the News Media. In D. Paletz (Ed.), *Political Communication and Action* (pp. 9-36). Cresskill, NJ: Hampton Press.

Virtuani, P. (2011, Nov 9). Riscaldamento globale: gli anziani salveranno il mondo. *Corriere della Sera.* Retrieved from: http://www.corriere.it/ambiente/11_novembre_09/riscaldamento-anziani-mondo_d7bcbe3a-0ae4-11e1-8371-eb51678ca784.shtml.

Vogel, D. (2002). The hare and the tortoise revisited: The new politics of consumer and environmental regulation in Europe. In A. Jordan (Ed.), *Environmental Policy in the European Union: Actors, Institutions, and Processes* (pp. 225-252). London and Sterling, VA: Earthscan.

von Altenbockum, J. (2013, Nov 11). Spiel mit Katastrophen. *Frankfurter Allgemeine Zeitung*. Retrieved from: http://www.faz.net/aktuell/politik/klimawandel-und-haiyan-spiel-mit-katastrophen-12658973.html.

Ward, R. E. T. (2009). Climate change, the public, and the media in the UK: A watershed moment. In T. Boyce & J. Lewis (Eds.), *Climate Change and the Media* (pp. 59-64). New York: Peter Lang.

Weart, S.R. (1997). Global warming, Cold War, and the evolution of research plans. *Historical Studies in the Physical and Biological Sciences*, 27(2), 319-356.

Weart, S. R. (2003). *The Discovery of Global Warming*. Cambridge. MA: Harvard University Press.

Weber, E. U. (2010). What shapes perceptions of climate change? *WIREs Climate Change*, 1, 332–342.

Weber, E. U., & Stern, P. C. (2011). Public understanding of climate change in the United States. *American Psychologist*, 66(4), 315-328.

Weber, E. U. (2016). What shapes perceptions of climate change? New research since 2010. *WIREs Climate Change*, 7, 125–134.

Weidner, H., & Mez, L. (2008). German climate change policy: A success story with some flaws. *The Journal of Environment Development*, 17(4), 356-378.

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, 261-283.

Weingart, P., Engels, A., & Pansegrau, P. (2008). *Von der Hypothese zur Katastrophe: Der anthropogen Klimawandel im Diskurs zwischen Wissenschaft, Politik und Massenmedien*. Opladen & Farmington Hills: Verlag Barbara Budrich.

Whitmarsh, L. (2009). Behavioural responses to climate change: Asymmetry of intentions and impacts. *Journal of Environmental Psychology*, 29(1), 13–23.

Whitmarsh, L., & Lorenzoni I. (2010). Perceptions, behavior and communication of climate change. Editorial commentary. *WIREs Climate Change*, 1(2), 58-161.

Wilkins, L. (1993). Between facts and values: print media coverage of the greenhouse effect, 1987-1990. *Public Understanding of Science*, 2, 71-84.

Wolf, J., & Moser S. (2011). Individual understandings, perceptions, and engagement with climate change: Insights from in-depth studies across the world. *WIREs Climate Change*, 2(4), 547–569.

Wood, D., & Vedlitz, A. (2007). Issue definition, information processing, and the politics of global warming. *American Journal of Political Science*, 51(3), 552-568.

World Meteorological Organization (n.d.). *World Climate Programme (WCP)*. Retrieved from: http://www.wmo.int/pages/prog/wcp/index_en.html.

WorldPublicOpinion.org. (2006, April 26). *30-country poll finds worldwide consensus that climate change is a serious problem*. Retrieved from: http://www.worldpublicopinion.org/pipa/articles/btenvironmentra/187.php.

Wurzel, R. K. W., & Connelly, J. (2011). Introduction: European Union political leadership in international climate change politics. In R. K. W. Wurzel & J. Connelly (Eds.), *The European Union as a leader in international climate change politics* (pp. 3-20). London and New York: Routledge.

Zhao, X., Leiserowitz, A. A., Maibach, E. W., & Roser-Renouf, C. (2011). Attention to science/environment news positively predicts and attention to political news negatively predicts global warming risk perceptions and policy support. *Journal of Communication*, 61, 713-731.

Zillman, J. W. (2009). A history of climate activities. *WMO (World Meteorological Organization) Bulletin*, 58(3), 141-150. Retrieved from: https://public.wmo.int/en/bulletin/history-climate-activities.

10 Appendix

10.1 Selection of newspapers

With regards to the overall design of this study, comparability has been the paramount criterion when selecting the newspapers for the empirical analysis. Furthermore, the following criteria had to be met:

- ***Publication frequency: daily***

Since the purpose of this study has been to analyze climate change coverage against the background of public opinion data, daily newspapers seemed more suitable as it might be assumed that they are more likely to affect audience perception, since their use probably resembles more of an "'integrated daily routine ritual'" (Nofri, 2013, p. 138). With regards to other types of periodicals or magazines (e.g. *Der Spiegel* in Germany) it proved, furthermore, difficult to meet comparability criteria. What is more, the daily papers have in both countries higher overall levels of diffusion.

- ***Circulation: widely diffused***

For the above-mentioned reason, the newspapers had to have a fairly wide circulation, reaching large parts of the population.

- ***Political orientation: at different points on the political spectrum***

For each country the two newspapers had to embody two different mainstream political orientations, in order to represent the largest spectrum of readers possible and in order to add another possible level of comparison.

- ***Type of publication: print and online***

Since the two Italian papers have only been accessible in their online-version, also the German articles had to be, for the period between 2010 and 2015, published online. The medium-to long-term corpus contains, instead, print and online articles, since in the early years of the period between 1992 and 2012 the online versions of the papers under study had not yet been available.

- ***Accessibility: Digital database***

The newspapers had to be accessible through a searchable digital database, allowing for the articles' retrieval and facilitating their digital archiving necessary for the subsequent analysis.

The Italian articles analyzed in this study have been obtained from the TIPS (Technoscientific Issues in the Public Sphere) project database,[95] developed within the context of the Pa.S.T.I.S. research unit[96] of the Department of Philosophy, Sociology, Education and Applied Psychology (FISPPA) at the University of Padua. The German articles have been retrieved and collected using the newspapers' own online archives.

10.2 Article retrieval

Within the databases, articles containing the following keywords (in English: "climate change", "greenhouse gas", "greenhouse effect", "global warming", "climate protection") have been searched[97]:

Italy	Germany
- cambiamento climatico - gas serra - effetto serra - riscaldamento globale - protezione del clima	- Klimawandel - Treibhausgas - Treibhauseffekt - Erderwärmung or globale Erwärmung - Klimaschutz

[95] The TIPS project, based on mass media contents such as online newspapers, aims at "analysing the way science and technology is represented in the public sphere in order to study the role of techno-science in society, its relevance and evolution" (Giardullo & Lorenzet, 2016, p.14). For this purpose and supported by a specially designed ICT infrastructure "capable of collecting, sorting and automatically analysing the text of newspaper articles in their digital format" (*ibid.*), it has been monitoring the eight most important Italian newspapers starting from 2010, and since 2014 also a number of UK, US, Indian and French newspapers. For further information visit: http://hal.cloud.tilaa.com/tips/about.

[96] http://www.pastis-research.eu/?lang=en.

[97] These keywords have been searched including their various possible grammatical endings.

In order to trace the distribution of all climate change-relevant articles over the period under consideration, all articles containing at least one of the above-cited keywords have been counted (see graphs reproduced in Chapter 7.1).

For the medium-to long-term period (1992-2012), instead, a sample corpus has been constructed for *La Repubblica* and the *Süddeutsche Zeitung,* using the "constructed week" sampling method, by which data collection days are randomly selected so that for each year under consideration a composited two weeks' period is compiled.

10.3 Topic detection

In order to identify the specific thematic areas which represent and characterize climate change coverage between 2010 and 2015, in both countries as well as in the single newspapers under study, a computer-based procedure called *topic detection* has been carried out. For this purpose, a total of 16 corpora have been constructed: For each year (2010-2015) the climate change articles published in the two newspapers representing each country, *Corriere della* Sera and *La Repubblica* for Italy, and *Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung* for Germany, have been pooled. Furthermore, for each newspaper all climate change-relevant articles published between 2010 and 2015 have been merged into one corpus each.

While for the Italian corpora all articles containing at least one of the above-mentioned keywords have been included, for the German corpora all articles containing at least four of the keywords predefined have been considered.[98]

The *topic detection* has been substantially supported by Dr. Paolo Giardullo (PhD), member of the TIPS team (see above), who has kindly provided me with his technical and analytical expertise. Dr. Giardullo has carried out the technical implementation of the procedure, providing me with the data necessary for the interpretation process.[99]

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[98] In order to contain the total number of German articles selected for storage and further analysis (as the figures in Chapter 7.1 suggest, the number of climate change-relevant articles in the two German newspapers was overall considerable higher than in the two Italian papers), an additional selection criterion had been applied: Those German articles suitable for storage had to contain a minimum of four keywords.

99 As mentioned in Chapter 7.2.1, the articles have been run through the algorithm Latent Dirichlet Allocation (Lda), generating a total of 20 topics each composed of 100 words which then needed to be interpreted and denominated by the researcher.

10.4 Qualitative text analysis

10.4.1 Corpus construction

As already mentioned in Chapter 7.2.2, for the purpose of the qualitative text analysis a total of six corpora have been constructed, three for each country. The three corpora comprise climate change-relevant articles from three different periods within the time span from 2010 to 2015:[100]

- September-December 2011
- September-December 2013
- COP21, 30 November - 12 December 2015 (including one week before and after the summit)

In order to consider only those articles (among all articles already stored and archived) for qualitative text analysis in which significant reference is made to the issue of climate change, a further selection criterion had been applied for the Italian articles: All articles added to the corpus had to contain a minimum of two of the above-cited keywords.
The total numbers of articles per corpus are as follows:

	2011	2013	COP21
Italy	46	45	38
Germany	32	62	36

10.4.2 Coding and analysis

The content of the articles has first been analyzed by assigning predefined codes to relevant text segments. Subsequently, this approach has been integrated with a closer reading of those articles that have been identified as especially relevant during the coding process.[101]

[100] For detailed reasons why these sample periods have been chosen and not others, see Chapter 7.2.2.

[101] Those articles containing reference to individual civil society actors have been selected for further analysis.

For the purpose of identifying those actors that have dominated climate change media discourses in Italy and Germany between 2010 and 2015, to all actors mentioned in the articles codes have been assigned. All actor codes have then been organized into three main categories: "countries, cities, regions", "institutional actors", and "individuals" (see Table 10 below).

Actors have been considered as such not on the basis of the roles assigned to them in terms of transitivity (e.g. passive vs. deliberate action), but simply on the basis of them being mentioned. If the same actor occurred more than once within the same article, he was coded only once. If two different actors belonging to the same category were mentioned in the same article, then the respective code has been assigned twice.

For the 2011-and 2013-sample, only actors appearing in the headlines, the subtitle and in the first paragraph have been coded. For the COP21-sample whole articles have been coded. While Figure 15 is based on the number of actors counted in the title, subtitle and first paragraph of the articles published in the three sample periods, the figures displayed in Table 9 instead are based on all actors counted (i.e. comprising also actors coded for entire articles in the COP21-sample).

Table 10. Actor categories

Code	Sub-code	Description
Countries, cities, regions	Countries, continents, world regions	Single countries (e.g. Germany, Italy), world regions and continents (e.g. Africa, South America, The Caribbean), general reference to types of countries (developing countries, developed countries, newly industrialized countries)
	Cities and national regions	Cities and regions (e.g. Venice, Liguria, Sardinia)
Institutional actors	Political institutional actors	Actors from the realm of politics, like • national or local political bodies (local authorities, political parties), national and supranational agencies for environmental or climate change-related issues (IPCC, WMO, EEA etc.) international bodies (UN, OECD etc.); single political actors, such as • politicians, heads of state or spokespersons of intergovernmental bodies such as the United Nations or the European Commission
	Scientific institutional actors	Actors from the realm of science and academia, like • universities, research institutes, research projects, science-based think-tanks, scientific journals, scientists or experts
	Economic institutional actors	Actors from the realm of economy, business and finance, like • companies, business lobbies, banks, rating agencies, CEOs

Code	Sub-code	Description
	Institutional civil society actors	Organized actors from civil society, like • NGOs, non-profit organizations, consumer associations, the media, the church, or prominent figures such as the Pope
Individuals	Citizens/consumers	"Normal" citizens and consumers
	Victims	People referred to as victims or refugees
	Activists	Activists, protesters
	Others	E.g. celebrities, writers, intellectuals, athletes

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