Crossing the borders of climate change: An analysis of cultural framings of climate change among migrants in Hamburg

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Declaration on oath

I hereby declare, on oath, that I have written the present dissertation by my own and have not used other than the acknowledged resources and aids.

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Abstract

Climate change is considered as one of the greatest threat to this planet. In the last decades, a number of scientific efforts have been dedicated to observe, measure and investigate its effects at both global and local levels. Climate change also got the attention of media, which covered this issue employing a wide range of narratives, ranging from sceptic to more alarmistic ones. Whilst climate change has been predominantly framed as a topic belonging to the realm of natural sciences, in recent years social sciences have increasingly and greatly contributed to the debate on this subject. Within this tradition, recent studies have highlighted the crucial importance of looking at climate change from the perspective of societies and of individuals in order to implement adaptation and mitigation strategies that are appropriate at local scale.

In a similar vein, the present work employs a focus on the local scale and on individuals and it adds on previous literature by bringing to light the variety of climate change meanings within the same physical space. In particular, the subjects of this research are migrants in Hamburg and their cultural understandings of climate change. In this dissertation, I discuss the conceptual framework and the implications of focusing on migrants and more broadly on cultures. From an empirical point of view, I present the results of in-depth interviews with Chinese and Italian migrants living in Hamburg, Germany. Furthermore, I draw on Construal Level Theory to analyse statements on climate change elicited by university students from Taiwan and Germany. Such theoretically based approach allows to investigate the ways that psychological distances (geographical, temporal and social) and construal levels inform climate change meanings across cultures.

The empirical findings disclose the role that culture plays in climate change´s perception in terms of values, experiences, understandings of nature and trust in the self and in others as agents of change. By doing so, this study conceptually challenges the idea that climate change is uniquely a matter of numbers, scientific data and graphs, and it acknowledges the importance of individuals, emotions and cultural experiences. In sum, this study highlights the relevance of taking into account society and individuals in the climate change debate and of recognizing the role of culture in individuals´ climate change meanings. Only by doing so, it will be possible to effectively tackle climate change and to convert it from threat into social opportunity.

Zusammenfassung

Der Klimawandel gilt als einer der größten Bedrohungen dieses Planeten. In den letzten Jahrzehnten wurden vielfältige wissenschaftliche Anstrengungen unternommen, seine Auswirkungen auf der globalen und lokalen Ebene zu beobachten, zu messen und zu untersuchen. Auch in den Medien ist der Klimawandel präsent, wo unterschiedliche Narrative von skeptischen bis hin zu panikmachenden präsentiert werden. Während der Klimawandel immer noch vorrangig als naturwissenschaftliches Thema behandelt wird, haben insbesondere die Sozialwissenschaften in den letzten Jahren verstärkte und wichtige Beiträge geliefert. Neue Studien haben auf die entscheidende Notwendigkeit verwiesen, den Klimawandel auch aus einer gesellschaftlichen und individuellen Perspektive zu betrachten, um somit lokal angemessene Anpassungs- und Risikominderungsstrategien entwickeln und umsetzen zu können.

Die vorliegende Arbeit knüpft an diese Erkenntnis an. Sie konzentriert sich auf die lokale Perspektive und auf Individuen und erweitert die bestehende Literatur, indem sie Unterschiede in den Bedeutungszuschreibungen des Klimawandels im gleichen geographischen Raum diskutiert. Im Zentrum stehen dabei Migranten in Hamburg und ihr kulturelles Verständnis des Klimawandels. Die Dissertation diskutiert einen konzeptionellen Rahmen und die Implikationen eines verstärkten Fokus auf Migranten und Kulturen im weiteren Sinne. Empirische Ergebnisse gründen sich auf Tiefeninterviews, die mit in Hamburg lebenden Migranten aus China und Italien geführt wurden. Aussagen zum Klimawandel, die durch Studenten aus Taiwan und Deutschland gewonnen wurden, werden mit Hilfe der Construal Level Theory analysiert. Dadurch kann untersucht werden, inwieweit sich psychologische Distanzen (geographische, zeitliche und soziale) auf die mentale Abstraktion des Klimawandels in unterschiedlichen Kulturen auswirken.

Die empirischen Ergebnisse verweisen auf die Rolle der Kultur in der Wahrnehmung des Klimawandels im Bezug auf Werte, Erfahrungen, Naturverständnisse und Vertrauen in die eigene Person und andere als Agenten des Wandels. Dadurch stellt die Arbeit die gängige konzeptionelle Vorstellung in Frage, dass sich der Klimawandel alleine naturwissenschaftliche Daten reduzieren lässt, und betont stattdessen die Rolle von Individuen, Emotionen und kulturellen Erfahrungen. Insgesamt verdeutlicht die Arbeit die Relevanz von Gesellschaft und Individuen in der Debatte zum Klimawandel und die Rolle der Kultur in individuellen Bedeutungszuschreibungen. Nur aus dieser Perspektive wird es möglich sein, mit dem Klimawandel effektiv umzugehen und ihn von einer Bedrohung in eine soziale Chance zu verwandeln.

Acknowledgements

Writing a dissertation involves dozens of challenges, false steps and redirects, highs and lows. For me, the greatest challenges have been recognizing the epistemological limitations of the positivism foundational to my natural science background and reflecting on how it pervades my worldview. Embracing constructivism—accepting the absence of one exclusive truth and the unpredictable, fluid nature of reality — has not been easy. Often, I fell back into old thinking routines; occasionally, it was even painful. But above all, it meant opening my mind to a more colourful and challenging perspective on the world and on the creation and definition of knowledge. Nothing and no one forced this shift from positivism to constructivism. Rather, it was a personal choice, a gift to myself to reach beyond what I had been taught up to that time. I was only able to take this step with the support of a number of people.

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Martin, your influence on my thinking and writing shines through every page of this dissertation and all the pages I am yet to write. Thank you for always being present these last four years, for pushing me to swim in the open sea of a PhD instead of letting me stand on the safer shore, and for always having just the right word to save me when I was drowning.

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Finally, I want to thank my family: my parents, for teaching me how to develop my own wings; my sisters, for being my safe harbour. Miguel, thank you for your unwavering support, but more importantly, thank you for providing me with the greatest reason for questioning positivism and embracing constructivism.

Preface

As I am the daughter and sister of migrants, and a migrant myself, the fact that I chose migrants as protagonists of my dissertation might not be so surprising. Nevertheless, this thesis is about not only migrants, but also culture and the cultural backpack that each of us carries, with or without a migratory background. My motivation is, in fact, to look at how different people see the same object in distinctive, culturally embedded ways. Each of these ways of looking encompasses emotions, knowledge and past experiences. Investigating these different ways holds the incredible potential to expand the object and enrich both the object and the researcher.

In this dissertation, I apply this curiosity about culture to the topic of climate change. Climate change is a topic of great interest owing to its current relevance; it is also a prime example of how viewing an abstraction through our cultural lenses can make it more concrete. Yet, the topic of cultures of climate change holds a number of challenges. The first is the complex, dynamic and multifaceted nature of culture and, consequently, its exploration. In addition, as shown in my work, climate change also encompasses many different issues and dimensions. Climate change occurs at both the individual and the community level; it is political and social, global and local; it is a consequence of the past, but it takes place now and in the future.

In order to better depict, explore and present such complexities of both culture and climate change, I initially opted for a cumulative dissertation. In fact, in the initial version, my dissertation was based on three papers, which represented the ontological process of my research and acknowledged the collaborative process behind it:

1) "Challenging the current climate change – migration nexus: exploring migrants´ perceptions of climate change in the hosting country" by Corinna de Guttry, Martin Döring and Beate Ratter (2016). Published in: Die Erde 147(2): 109 – 118.
2) "How distant is climate change? Construal Level Theory analysis of German and Taiwanese students´ statements". (accepted for publication in International Journal of Asian Social Science) by Corinna de Guttry, Martin Döring and Beate Ratter (2017) Published in: International Journal of Asian Social Science 7(5):434-447
3) "Untying the climate knot: An analysis of psychological distances and proximities permeating climate change meanings in North Frisia" (in review process) by Corinna de Guttry, Diana Süsser and Martin Döring.

But, as I learned over the last four years, reality rarely conforms to our expectations. The length of the review process for one of the papers required a shift to a different structure. In this version, I have tried, instead, to represent the different theoretical, methodological and empirical aspects of culture

and climate change using a more unconventional structure. You will, therefore, find a continuous reflection upon the scientific process in all of its phases, based on both my empirical data and the existing literature.

Beyond such structure-related issues, I hope this dissertation will reveal the cultural nature of perceptions of climate change and instigate a process of self-reflection on our understanding of the self, of the Other, of nature, and of climate change, which is neither unique nor exclusively legitimate, but rather an artefact of our culture(s).

Corinna de Guttry

Hamburg, October 2016

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List of abbreviations

CLT – Construal Level Theory

IPCC – Intergovernmental Panel on Climate Change

T+TST – Ten plus Ten Statements Test

UNESCO – United Nations Educational, Scientific and Cultural Organization

DE – Germany

TW – Taiwan

IT– Italy

Chapter 1

A cultural perspective on climate change

Climate change is simultaneously multi-sited and local, overwhelming yet intangible, inexorable and compelling. It is boundless in time and in space; everyone is responsible but not everyone engages with it actively. Notwithstanding its convoluted character, climate change is too often simplified and bounded by borders and dichotomies: science/society, past/future, human-made/natural, local/global, distant/close. Only "by dissolving the strained boundaries between nature and culture, by revealing that knowledge and scale are co-dependent, by disclosing the spatial contingencies of climate change knowledge" (Hulme, 2007: 9) might it be possible to frame climate change in a more meaningful and less deterministic way.

In my work, I aim to cross these borders from a conceptual, methodological and empirical perspective. In this first chapter, I focus on the conceptual framework and the relevance of exploring the cultural and individual perspective and dimensions of climate change.

1.1 There is not only one environment; there is not only one climate change

In 1972, Joseph Sonnenfeld, an almost forgotten but pioneering geographer in environmental perception and behavioural studies, developed the environmental perception model (Sonnenfeld, 1972). The model represented one of the first geographical contributions to the topic of perception, which, until then, epistemologically had belonged to the realm of psychology. More than four decades later and after many societal changes, his simple model retains its relevance to understanding the relationship between humans and the environment. As illustrated in Figure 1, the model explicates the different types and dimensions of the notion of environment: the geographical, operational, perceptual and behavioural. As the model shows, these dimensions overlap and interlink. Yet, each represents a different concept and type of environment, with different implications. The *geographical* is defined as the most inclusive and is also material, such that it can be measured and quantified: it is,

according to Sonnenfeld (1972), the area of interest in the natural sciences. Within the objective geographical environment there is the *operational environment*, which is the area in which an individual operates; it is differently structured for each individual. It differs from the geographical as it impinges on human beings. Anthropologists, historians and parts of geographers dedicate their research to this level of environment. The individual is actively aware of only a portion of the operational environment; this portion corresponds with the so-called *perceptual environment*. As such, the perceptual environment has an individual component, but it can also be shared by the community. In fact, the environment is perceived through a "cultural filter" (Jackson & Hudman, 1990): individual(s) become familiar with it through experience, perception and learning. The resultant environment is that which is actively perceived by the individual, and which encompasses emotional, tangible and intangible aspects. The last level of environment presented by Sonnenfeld (1972), and the main focus of his work, is the *behavioural environment*. The behavioural environment encompasses those aspects of the environment which lead individuals and communities to consciously act in certain ways, in order to adapt to the environment or to transform it.

This classification of environment shows that there is not one objective and absolute environment, but rather many, coexisting and nested environments. The objective and physical environment should not be considered either more important or more real than the one perceived and experienced by individuals. The relevance and usefulness of Sonnenfeld's model consists in offering an integrative perspective of the concept of environment, within which each dimension provides meaningful and substantial insights into human-environment relations and interactions.

One decade after the publication of the Sonnenfeld model, one of the most significant topics for environmental studies began to emerge: climate change. In the mid-1980s, a number of scientific efforts were dedicated to investigate the consequences of climate change on ecosystems, as well as its anthropogenic causes (Moser, 2010). Through media exposure, climate change ceased to be solely a scientific issue and took on societal meaning(s) (Brügemann et al., 2016). From 2007 on, this process was fuelled, in particular, by the IPCC and Stern reports (Egner, 2007). In this context, the environmental perception model proposed by Sonnenfeld in 1972 could have offered a clearer picture of how different and coexisting types of human-environment(al)

relations and interactions are involved in the topic of climate change. As I discuss in more detail below, this great opportunity was missed and socio-cultural perspectives on the environment and, consequently, on climate change remain largely overlooked.

To begin, I apply Sonnenfeld's model of environment to climate change to identify its different aspects (see Fig.1). Applying Sonnenfeld´s concept of geographical , it is possible to define "geographical climate change" as the one that includes all those physical and biological changes that currently appear to affect the global system or are predicted to occur in the future. These changes are measurable and represent a topic of interest to oceanographers, physicists and, more generally, natural scientists. At this point, it is important to highlight that the term "geographical" with respect to climate change should not be confused with geography as discipline, which greatly contributes to the understanding of the human-climate change interaction, as in the case of emotional (Ryan, 2016) and cultural geography (Revill, 2016). An example of geographical climate change as defined following Sonnenfeld's geographical environment would be global sea level rise or changes in the ocean currents. By contrast, events such as storms, heat waves and floods bear a direct impact on the ecological and social system where a particular group lives and belongs, therefore, to "operational climate change". In this case, climate change is not global anymore (as in the geographical environment) and it acquires a regional and local dimension.

Yet, only a part of it is perceived by individuals: the perceptual (or perceived) climate change. To be perceived as meaningful and real by individuals, climate change is interpreted through cultural lenses: experiences, values and emotions are used as anchors for making sense of it. Anthropologists, human geographers and psychologists investigate such meaning-making processes and the resulting individual´s framing of climate change. Finally, drawing on the concept of behavioural environment, "behavioural climate change" is that which is often demanded by policy makers and media. Behavioural climate change comprises the adaptation and mitigation measures that individuals consciously take to tackle climate change.

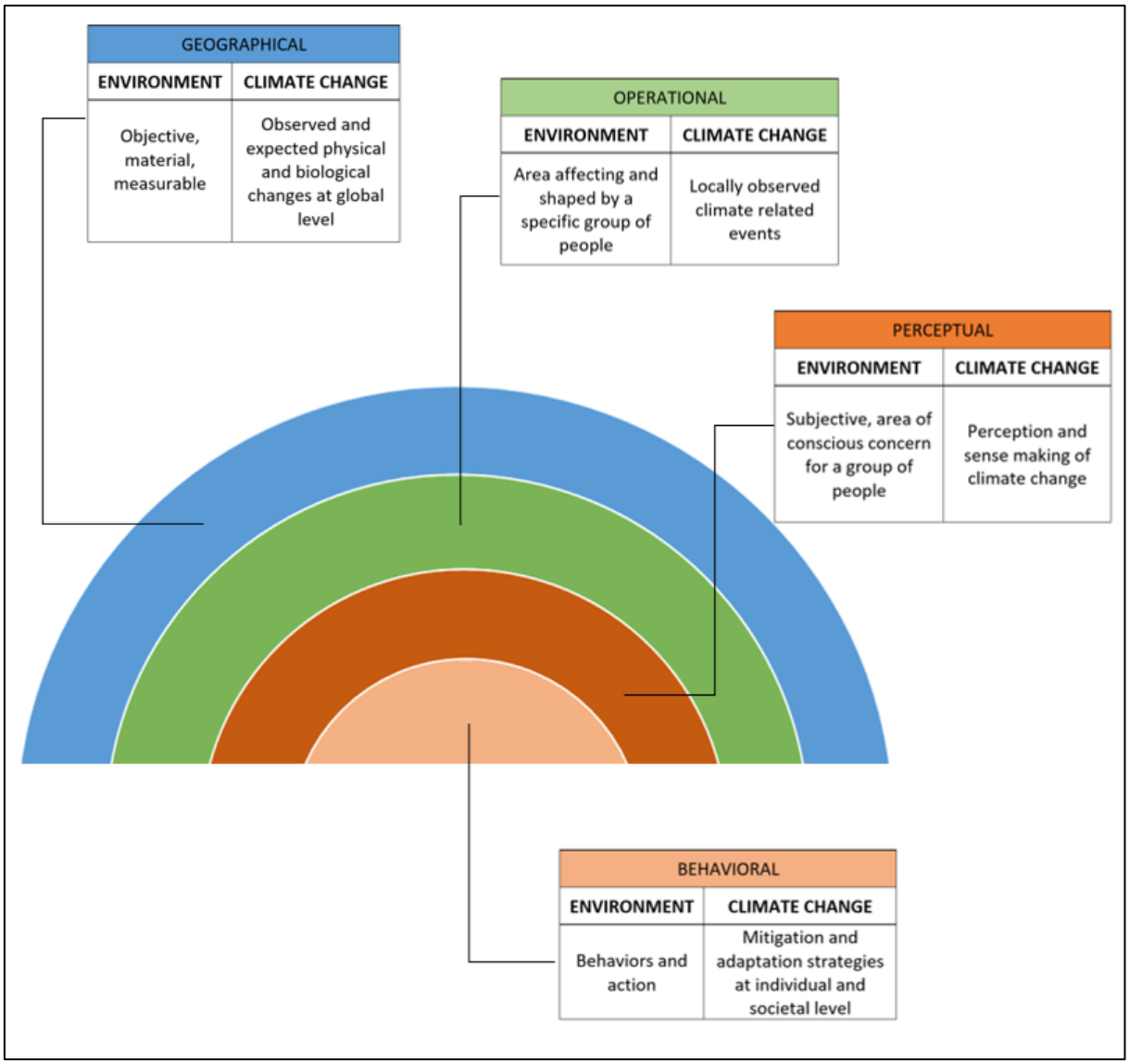

Figure 2: Model of climate change drawing from Sonnenfeld (1972). *In this figure the four types of environment theorized by Sonnenfeld (1972) are applied to the topic of climate change.*

The first decades of discussion of and research on climate change have witnessed a predominance of interest in what, based on Sonnenfeld's levels of environment, I would call "geographical climate change": the objective, physical, observable and global dimension. Since the beginning of the discussion, a number of studies have attempted to describe the effects of increasing CO_2 emissions on the physical system and to predict their cumulative global impact over time. At present, these studies still predominate. Although studies on the socio-economic aspects of climate change have begun, epistemological scepticism and conceptual challenges have proven difficult to be

overcome due to the instituteonalisation of climate change (Cornell, 2010; Mooney et al., 2012). Even in such cases, the focus has mainly been on the anthropogenic causes of climate change and on their consequences for the socio-economic system, rather than on people´s sense making of climate change (Olsen et al., 2013; Cornell, 2010). As a consequence, subjective and local climate change (perceptual) has been largely overlooked, gaining relevance only recently.

The state of the field contrasts with the prescription of Sonnenfeld´s model that all levels of the environment are taken into account and given value. As mentioned above, climate change is often seen as a topic which predominantly belongs to the physical and objective realm. But at the same time, individuals are asked to change their behaviours (and even daily routines) in order to mitigate and adapt to climate change. Thus, only the two endpoints of the model are taken into account: geographical climate change and behavioural climate change. Operational climate change and perceptual climate change are simply ignored when they are not seen as a black box which is better left unopened. This resistance is also reflected in the deficit-knowledge model widely applied in the last decades by communicators, as well as by academics, in the context of climate-change communication (Moser & Dilling, 2011). The deficit-knowledge model suggests that supplying individuals with sufficient scientific and objective information will make them act in climate-friendly fashion and, thus, help to successfully tackle climate change. The model has been criticized for seeing individuals as “empty boxes” to be filled with so-called scientific knowledge, and for neglecting non-scientific persons who are capable of making sense of climate change with reference to their daily experience and culturally transmitted knowledge(s) (Bucchi, 2008; Moser & Dilling, 2011).

In recent years, the limits of this model have been acknowledged, and it has become increasingly clear that looking at climate change from the perspective of individuals is of crucial importance (Bulkeley, 2000). In fact, including this perspective holds the potential to instigate culturally based adaptation and mitigation strategies, and it should lead to strategies that are more democratic, socially fair and sustainable (Adger et al., 2006; Eriksen et al., 2011). One of the first studies to take this direction, conducted in

1991 by Kempton (Kempton, 1991), aimed to reveal perspectives of climate change among ordinary citizens and to understand their processes of meaning-making (which were by then correlated to ozone depletion, photosynthesis, pollution and temperature variation). Since then and from across the world, studies have paved the way towards a scientific understanding of locally meaningful and personal relevant climate change. Among others, studies have recognized the multiple epistemologies of climate change (Popke, 2016) and explored climate-change sense-making (Yeh, 2015) of: smallholder farmers in China (Burnham, 2014), Inuit in Canada (Leduc, 2011), coastal users in the Comoros islands (Ratter et al., 2016), farmers and local residents of Cornwall, United Kingdom (Leyshon & Geoghegan, 2012), coastal dwellers in North Frisia, Germany (Döring & Ratter, 2017), local experts and journalists in two German coastal cities (Christmann et al., 2014), and of a focus group in Sweden (Wibeck, 2014). This novel and significant body of literature reveals how non-scientific publics create, maintain and recreate climate-change meanings. By focusing on the individual and local scales, these studies shed light on how local epistemological frameworks differ from the predominant scientific and global ones.

My research follows the direction of the foregoing studies and adds to them by showing the variety of perceptual environments and climate-change meanings existing within the same local scale. I focus my research on migrants' framings[1] of climate change, in order to reveal how these are embedded in everyday practice, local places and informed by experiences and worldviews. In the second part of my work, I analyse the role of culture in climate change framings employing a different approach and focusing on a different group of participants: students living in their home country. More exactly, I choose two different groups of students belonging to extremely different cultural contexts. More broadly, I argue that to understand the human-climate change relationship it is crucial to look at the perceptual space "with its infinite possibilities that, when translated into action, can dam rivers, seed clouds, denude forests, and place lush green golf courses on Arabian sands" (Hassan, 2000: 128).

[1] Framings are hereby understood "as a way of organizing ideas and defining a phenomenon in order to resonate with people's core values and assumptions. Importantly, (...) framing allows people to identify quickly what matters, who might be responsible, and what should be done" (O´Neill et al., 2010).

1.2 Climate change and migration

Migrants have increasingly become protagonists in the discussion of climate change, but differently than in this present research. In recent years, migration has, itself, been a significant element of the discussion. While it gained major importance over the last decade, the relationship between climate change and migration had already been mentioned in the IPCC report of 1992: "the gravest effects of climate change may be those on human migration" (Watson et al., 1997: 103). As indicated in this quote, this relationship was framed largely in terms of a cause and effect; that is, climate change is said to be the cause of the migration of people. Such deterministic or functionalist accounts persisted through the last decade, where neologisms such as "climate refugees", "climate induced migration", and "forced migration" have appeared in a number of studies, interestingly mainly carried out in areas in the global south (IOM, 2009; UNESCO, 2011). These terms can also be found in several policy reports, though the terms´ legal status is still under scrutiny (McAdam, 2012). As highlighted by Bettini (2013), the approach of these studies is not only problematic from a legal point of view, but also might pave "the way for xenophobic reactions, de-empowering the concerned populations and de-politicizing the issue" (Bettini, 2013:63 – 64).

Emergent alarmist discourses on climate refugees also have resonance at the policy level and in the media, where climate refugees are depicted as powerless victims of climate change (Farbotko & Lazrus, 2012; Hartmann, 2010), a human version of the flagship symbol of the polar bear. The case of the inhabitants of Tuvalu, framed as world´s first climate refugees is emblematic: islanders are drowning due to sea level rise and they seem to be unable to do anything but migrate to another place. These discourses belong to scientists and politicians, while islanders´ perspectives have rarely been considered. By doing so, they disregard the more complex reality of Tuvalu´s people for whom mobility is and has always been part of their history, and indeed daily practice, such that climate change is not the one and only migration driver (Farbotko & Lazrus, 2012). Again, climate change – even in social science-based studies – is seen as a physical problem or a behavioural issue (sea level rise; migration). Only the endpoints of Sonnenfeld´s model are taken into account, and consequently, the local, individual scale and the existence

of different, yet legitimate, cultural framings are neglected. This has important implications, as migrants are conceived as passive actors or even as security threat. Consequently, they are predominantly framed in negative terms, rather than being understood as a phenomenon that has existed throughout human history.

In my work, I overturn this discourse by framing migrants as active actors who hold their own understandings of climate change. I suggest a perspective focused on migrant perceptions of climate change rather than on climate change as the cause of migration. Simply put, my research interest is not whether migrants moved in response to climate change or not, and my aim is not to test their knowledge of climate change based on a pre-imposed scientific or Western definition of climate change. The question is rather how migrants make sense of climate change in their host country and how their experiences and cultural lenses shape meaning-making processes in the context of their current livelihoods. Before going into detail of why and how migrants should be the focus of a research on individual meanings of climate change, it is useful to examine how the nexus of migration-environment has been approached and conceptualized in the last decades.

1.3 Migrants and environment

Looking at how the migration-environment relationship developed throughout the last decades, it can be seen to have experienced several different stages. During the first half of the twentieth century, the concept of carrying capacity (Hawden & Palmer, 1922) prompted a negative connotation of the correlation between immigrant and environment. According to this concept, to be sustainable, every given environment can support only a certain number of individuals. This lead to an implicit theoretical rationale that increasing immigration was correlated with increasing population and, therefore, with increasing environmental degradation (for a review see: Muradian, 2006). Carrying-capacity studies employ “objective and measurable” methods to justify these assumptions and to hide racist beliefs. In a more nuanced version of this tradition, a number of surveys investigated the “white” versus “black” use and perception of “nature”, finding that in comparison to white people, non-white individuals were less environmentally concerned and were less likely to engage in pro-environmentally

related activities (Taylor, 1989). In the 1970s, Hare (1970) and Jones (1975) responded to this approach by developing the concept of black ecology and apartheid ecology which called for the recognition of black people´s environmental concerns and interests (Cleere, 2016).

The tension between "white and black"/local and immigrant accounts has been replaced by an approach that recognizes that different meanings of environment can coexist in the same physical space. These scholars go beyond the dichotomy of white/not white and, also, of a right or wrong understanding of nature and of its beneficial or harmful use. Instead, they explore the different ways ethnic groups engage with and make use of the environment, arguing that immigrants should be seen as an integral and enriching part of the community, rather than a detrimental one. These studies mainly take place within the context of leisure studies and are geographically based in North America (Stodolska et al., 2011; Tinseley et al., 2002), Australia (Goodall, 2012; Klocker et al., 2015) and Northern Europe (for a review, see Kloel et al., 2013). In this body of literature, the use and perception of national and regional parks (Low et al., 2005; Lovelock et al., 2011; Roberts, 2016) and landscape preferences (Rishbeth, 2001; Buijs et al., 2009) are the predominant focus, while in-depth interviews and ethnographic fieldwork represent the most common methods.

This recent body of literature which sees migrants as environmental actors has remained confined to leisure studies without "migrating" to the topic of climate change. In fact, as previously illustrated, the migration-environment nexus is still strongly seen as a cause and consequence or effect when applied to the specific case of climate change. Beyond the different disciplines involved, in part, this failure to translate can probably be found in the relatively short life of climate-change discussion as compared with the broader issues of migration and the environment. Even more important, however, is the predominance of the objective geographical environment in the research agenda of climate change, at the expense of the perceptual system. As a consequence, when one thinks about migrants and climate change, the first thing that comes to mind is migrants being migrants because of geographical climate change. Yet migrants are actually part of emplaced society, which is constantly required to tackle climate change, and whose

perceptions are fundamental for the understanding of human-climate change interactions.

In my work, I aim to advance the discussion of the migration-climate change nexus, by drawing from the idea of migrants as a constitutive, proactive and enriching part of the urban fabric. In so doing, I apply a concept – migrants as actors and integral part of the society – which belongs predominantly to leisure studies to the geographical field and, in particular, to the topic of climate change. At this point it becomes pressing to ask why it is important to focus on migrants and not, for example, women, children or other subgroups of a society. In the next section, I answer this question and illustrate the various aspects that lead me to dedicate my research to migrants.

1.4 Why migrants?

Returning to Sonnenfeld's model of environment(s) (1972), even considering society´s increasing mobility, it can be shown that, each person has an individually tailored model of environment which consists of: 1) the geographical environment, the Earth; 2) the operational environment, where the individual moves and lives; 3) the perceived environment, understood by the individual through his/her senses; and 4) the behavioural environment, which leads the individual to take adaptive actions.

In the case of a migrant, the picture becomes much more complicated. The geographical environment is the same, as its physical characteristics remain unalterable. The migrant shares the operational environment with others who live in the same area. But the lenses through which a migrant perceives his or her environment (their perceptual environment) are different than those shared by local people. While the perceptual environment is, by definition, unique and individual, it may be shared by those individuals who hold similar worldviews and experiences. In other words, each environment is perceived in a different and unique way by each person. Nevertheless, at the community level, shared patterns of perception will be found among people who share the same cultural lenses. Obviously, this bears on the behavioural environment and, more concretely, on which actions and routines are carried out.

Applying this concept to the specific case of climate change, it can be seen that even when the physical geographical space and the manifested climate change are the same, the entire community may not filter this information in the same way. Migrants, therefore, offer a new perspective on climate change, one which results from experiences, worldviews and knowledge(s) that challenge the prevalent discourses of climate change. Analysing migrants' understandings of climate change: a) reveals the extent to which culture impacts perception of climate change; b) shows which features of climate change are shared across different cultures and which differ; c) draws attention to, provides evidence of and explores the cultural, emotional and personal aspects of climate change, rather than its physical, objective and measurable features.

Beyond these conceptual matters, several other issues make migrants a useful focus group for climate-change studies. The first issue is their absence in studies of climate change. To the best of my knowledge, to date no other study has investigated how immigrants perceive climate change. This gap in research has been acknowledged by other researchers: "The potential to appropriately support ethnic minorities and migrants to sustain environmentally beneficial transport practices...has been overlooked" (Klocker et al., 2015: 3); and "little is known about how people of varying cultural backgrounds conceptualize issues such as sustainability, climate change…" (Maller, 2011: 237). Despite the recurring call for studies that explore the heterogeneous understandings and interpretations of climate change coexisting in any given society, the majority of studies rather remain at a conceptual level and do not provide empirical evidence of the impact of different cultures on the perception of climate change at local level.

Empowerment von Migranten zum Klimaschutz (2014) (the ENIGMA project) represents an exception to this trend, even if its aim differs from the present conceptual focus. In fact, rather than exploring immigrants´ climate-change perceptions, the study investigates immigrants' adaptation- and mitigation-related behaviour in daily life. In this sense, the ENIGMA study breaks the ice, and it pioneers empirical studies on immigrants and climate change by carrying out a survey and in depth-interviews with the Russian and Turkish community in Dortmund and Berlin (Germany). Drawing on the

results, the authors explore how to further promote climate change engagement within migrant communities. The ENIGMA project has the merit of giving a birds-eye view of the variety of climate change-related behaviour carried out in the same urban context. Yet, it fails to explain what triggers this behaviour or to explore the underlying sense-making processes which are the focus of my present work.

In the broader context, across disciplines and beyond the specific case of climate change, immigrants are underrepresented in street and phone surveys (Carlsson et al., 2006; Case & Smith, 2000). This absence is particularly striking when considering the percentage of immigrants in society. In Germany, in particular, one in three inhabitants is an immigrant, and this percentage is expected to grow in the coming years. Such a percentage is too high to be ignored. These numbers demand recognition and require valorisation of the diversity of knowledge(s) and meanings that exist in society and in shared geographical space. The first step consists of considering immigrants not solely as minorities but rather as an integral, enriching and active part of the community in terms of climate change and otherwise.

The geographical distribution of immigrants in urban (and non-urban) space is a further crucial reason for focusing on this group in research on climate change. As widely demonstrated, immigrants tend to live in risk-prone areas and are considered vulnerable because of language barriers and unequal access to institutional resources (Collins, 2009; Cutter et al., 2003; Koks et al., 2015). Taking all of these reason together, it becomes clear that immigrants and their cultural understanding of climate change deserve particular attention when investigating a society's perception of climate change from a local perspective.

1.5 Aim of the study and research question(s)

As discussed in the previous sections, climate change is predominantly presented in its objective and measurable features, while perceptual or perceived climate change is too often undervalued. In particular, research on the role of culture in the framing of climate change is needed and empirical studies are dramatically lacking. My study contributes to challenging the dominant approach, as it offers a new perspective on: a) how the public makes sense of climate change, beyond scientific rationales referring to numbers

and graphs of increasing CO2; b) how the perception and assessment of climate change is influenced by and engrained in an individual´s culture.

I argue that in the same physical space there is not a singular, coherent way of making sense of climate change. Instead, many understandings and interpretations of climate change, embedded in cultural worldviews, experiences and emotions, coexist within that space. Exploring commonalities and differences in climate change perceptions across society enables a critical reflection on human-culture-environment relations and, hopefully, paves the way towards more inclusive and locally relevant adaptation and mitigation strategies. In order to investigate cultural climate change, I will focus on immigrant communities in Hamburg, Germany. This study explores individual perception of climate change, but it does so by focusing on migrants, who have previously been framed as victims and whose potential contribution and involvement in adaptation and mitigation process have been overlooked.

In addition to the focus on migrants and on the heterogeneity of climate change meanings coexisting within the same physical space, I also analyse climate change meanings existing in different countries, thus different physical and cultural spaces. To do so, I investigate the differences and commonalities of climate change definitions among two groups of students in Germany and in Taiwan.

In summary, the overall objective of this thesis is to examine cultural framings of climate change, and, in particular, to investigate how individuals go beyond scientific and powerful climate change definitions to reconstruct climate change as a cultural object.

Although this aim guided the research, further questions emerged as I reviewed the scientific literature and collected data.

The first, concrete group of subquestions is as follows:

a) What are the perceived causes and consequences of climate change in different cultural groups?
b) What is the role of trust in institutions in climate-change perception across cultures?
c) What adaptation and mitigation measures are pinpointed by people holding different cultural backgrounds?

These questions were instigated by the existing literature, as these elements are recurrent across a number of quantitative and qualitative studies (Arbucke et al., 2013; Bostrom et al., 2012; Süsser, 2016). By investigating the same aspects and employing the same analytical rationale, this study can add on previous studies. In this way, the present results can be compared with studies located in other geographical areas or in the past and contribute to understanding the development of climate-change perception among the non-scientific public.

The second subquestion which came to light during my research is: How is climate change perception informed by geographical, temporal and social distance?
This question is strongly influenced by previous research on Construal Level Theory (Trope & Libermann, 2010) (CLT), an approach that explains how people make sense of an object (in this case, climate change) in the geographical, temporal and social dimension and related implications. Through this framework it is possible to understand when and where climate change is perceived to happen and who is perceived to be affected by it. As the scientific and media-based temporal and spatial framings of climate change do not match the social framing, which is based on personal experience and observation, the understandings generated from CLT cannot be overvalued. Again, exploring people´s perception of climate change will shed light on how the public construction of climate change might differ from the scientific construction. Understanding this aspect is the first step to designing and establishing meaningful measures to tackle climate change.

The present study addresses not only the two correlated but different groups of subquestions above mentioned, but also the related conceptual and methodological challenges. The multilevel nature of my research resulted in a non-traditional structure of this dissertation, which I illustrate and explain in the next section.

1.6 Structure of the thesis

As mentioned above, this work does not follow the traditional structure of introduction, theory, method, results, discussion and conclusion. Instead, it is characterized by a

continued reflection on the research process and on the position of this study within the existing literature. In this first chapter, I presented the conceptual framework of my work, its rationale and the research questions that inform my entire work.

In Chapter 2, I reflect on how the employed conceptual framework and, more generally, research into culture and climate change poses both conceptual and methodological challenges and how I solved them. Specifically, I introduce the method applied, how it has been used by other authors and how I adapted it for the aim of my study. Next, I present my case study and the participants. Finally, I reflect on the problem of designating the nation a cultural unit, on what it means to be a migrant that studies other migrants, and how this might influence or impact the research process.

After focusing on the methodology employed in my work and on its implications, I will continue with two chapters that provide empirical answers to the two groups of questions I raised. Chapter 3 answers the a) group of subquestions; its focus is the cultural lenses and framings through which individuals interpret their operational environment and shape the perceptual environment. This part of the dissertation delves into the different cultural understandings of climate change and explores the intersections between the current lived environments (or operational environment according to Sonnenfeld´s model), the past-experienced environment, and cultural worldviews. In this chapter, my willingness to challenge the current picture of migrants as victims becomes particularly evident. In fact, I suggest a rather different perspective which looks at migrants' potentials for adaptation and mitigation measures in the hosting country.

Chapter 4 offers a more theoretical perspective that draws from CLT (Trope & Liberman, 2010) and focus on the second of the subquestions informing my work. Through this approach, I explore the extent to which operational climate change corresponds geographically, temporally and socially to perceptual climate change. More specifically, I interrogate two groups of students belonging to different cultures (Taiwanese and German) to compare their climate change meanings in terms of temporality, spatiality and sociality. *Where is climate change? When is climate change? Who is affected by it?* In Chapter 4, I address these issues, providing an answer to research question (b). I close

the chapter with a reflection on CLT (Trope & Liberman, 2010), how it is linked to the concept of place, and reveal how climate-change meanings are embedded in and affected by places. I reflect on the importance of taking into account both psychological distance *and* proximity, where climate-change meanings encompass both the local *and* the global dimension, the past, the present and the future, the self and others. Such a dynamic approach goes beyond the dichotomy of positive proximity versus negative distance widely suggested in previous literature and recently criticized; it suggests a much more complex picture that introduces a new perspective on what place (and climate change) actually represent.

While Chapters 3 and 4 differ in method and focus, they are mutually and complementarily informative. One focuses on cultural climate change meanings coexisting in the same physical space, the other on climate change meanings formed and lived in the country of origin, comparing different physical and cultural contexts. Each contributes to exploring the link between culture and environment and addresses both the general research question and the subquestions.

Chapter 5 begins with an outline of the key findings of the present study, referring back to the research aim and objective. It then discusses both the conceptual and the methodological framework employed in terms of their advantages and limitations. During my research process, I identified a number of avenues for future development and exploration. Grouping them into two potential fields of study, I discuss them in section 5.4. I conclude by sketching the policy implications and societal relevance of my study.

Before turning to the methodological chapter, I first offer operational definitions of key recurrent terms in the remainder of this thesis.

1.7 Note on definitions

In this thesis, I refer regularly to culture and migration. Both are very broad concepts which can be defined in a number of ways, each of which holds different implications. In the following, I briefly explain my understandings and the working definitions I draw from in the remaining chapters.

1.7.1 Culture

The definition of culture is contested, and it is approached from different angles depending on the aim and focus of the study, as well as on the temporal and geographical location of the study (Bhaba, 1994; Subramaniam & Ramiah, 2014). In recent years, the term has gained further ambiguity from booming globalization, increasing migration and expanding media influence (Heyd, 2010). Scholars have explored culture in its performative dimension (Geiselhart et al., 2015), its correlation with places (Adger et al., 2013), and its shared dimensions among members of a society (Strauss, 2012). Despite their different foci, all of these and other authors agree upon the dynamic nature of culture. Cultures should not be understood as "neat, homogeneous, isolatable units that can be apportioned to discrete human groups" (Heyd, 2010: 88). On the contrary, cultures should be seen as fluid, continually transforming in response to external and internal changes; they should be understood to be constantly produced and negotiated at individual and community levels. Notwithstanding the unquestionably dynamic nature of culture, I argue that it is possible and useful to identify shared patterns which differ from one group to the next. For the purpose of this study, I will refer to such patterns, in a more general sense, as cultures. This heuristic has its advantages and limits; I reflect in more detail on the problem of using culture as an analytical unit in the methodological chapter.

In keeping with these methodological concerns, I employ this working definition of culture: "The system of shared beliefs, values, customs, behaviors, and artifacts that the members of society use to cope with their world and with one another, and that are transmitted from generation to generation" (Bates & Plog, 1976: 7). This approach fits my study particularly well because it:

i) emphasises how culture is used to "cope with [the] world", which leads to the question of how a culture copes with a world that is not the one in which it was originally formed;

ii) utilizes an intergenerational approach, mainly absent from other definitions and of great relevance when studying the culture of migrants (first and second generation);

iii) includes both the cognitive (beliefs and values) and the behavioural (customs and actions) dimensions of culture and, in so doing, does not limit culture to an abstract concept but also encompasses its more tangible aspects.

In her paper on how (and if) cultures are endangered by climate change, Sarah Strauss (2012) lists some moral principles to be taken into consideration when talking about culture. Among them, one deserves particular attention for the aim of this study: the equality among all cultures. There are not better and worse cultures, just different ones. Further, it is not possible for a society or an individual to have less or more culture. In the context of my research, this aspect is of great importance, as my aim is not to look for the best culture of climate change but rather to shed light on the variety of cultures of climate change, coexisting in the same space.

1.7.2 (Im)Migrant

As in the case of culture, the term migrant is not easy. In fact, there is no consensus on what a migrant is and what s/he is not. Efforts have been made to establish different types of migration depending on distance (e.g. local versus international), time (e.g. permanent versus temporary), cause (e.g. forced versus voluntary) and direction (e.g. from rural to urban, inter-urban) (King, 2012) and so on. While this taxonomy can be extremely useful for systematic analyses in migration studies, its focus is mainly on migration as a phenomenon; it, therefore, and fails to offer insights on migrants as subjects of this process. In this sense, less operational definitions which focus on migrants vary from migrants as agents of change (Klocker, 2015), "complex and contradictory subjects" (Lawson, 2000: 175), "actors of a culture of bonds" (Diminescu, 2008: 567) to "we are all…migrants… Once we're in the world, we're on the move" (Josipovici, 1977: 180). In an interesting twist on these ideas, Russel King (2010) reflects on the correlation of the concept of migrants with the concept of movement. He turns this approach upside down and suggests rather looking at the phenomenon of migration in terms of sedentarism. In his view, what distinguishes migrants is actually their constant search for a place to stay and their continuous production of attachments to new localities and their creation of forms of multi-belonging (King, 2010).

The target of my study is not migration as a process or migrant in general, but rather immigrant. In particular, immigrants who chose Germany (Hamburg) as their country of destination and that are currently living there. I will therefore employ the working definition of immigrants used by the Statistical Office of Hamburg:

> “Zu den Menschen mit Migrationshintergrund zählen „alle Ausländer und eingebürgerte ehemalige Ausländer, alle nach 1949 als Deutsche auf das heutige Gebiet der Bundesrepublik Deutschland Zugewanderte, sowie alle in Deutschland als Deutsche Geborene mit zumindest einem zugewanderten oder als Ausländer in Deutschland geborenen Elternteil." (Statistiches Bundesamt, 2014: 6).

The participants in my study are therefore or individuals who were born in another country and then moved to Hamburg (first generation), or children of at least one first-generation migrant.

In the next chapter, I describe in more detail the migrants focused on for this study. I also illustrate how concepts introduced in this introductory chapter, such as perceptual climate change, culture, and migrants as active actors, pose methodological challenges and how I overcome them.

Chapter 2

Methodological framework

Methodological design may seem rather straightforward, a quick and painless stage of research. But designing a method is much more than choosing a tool to answer a research question. In the case of the present study, the process behind the method design and its application consisted of continual reflection and reflexivity, and encompassed several different issues. The first issue was a reflection on the method´s consistency and its epistemological framework, followed by reflections on its capacity to bring to light cultural framings of climate change. Once the method had been designed and the empirical period began, I experienced the method´s limits, its potentials and its more pragmatic aspects. As soon as the method started to become familiar, the urgency of reflecting upon my subjectivity and my positionality within the research process became more pressing. Therefore, I address all these different stages and aspects by introducing the methods employed, the participants chosen and the challenges I encountered, coupled with the reflections that instigated and accompanied the research process.

2.1 Challenges

The method of a research project has to be consistent with the research´s epistemological position and should, therefore, respect the adopted assumptions of what knowledge is and how it is created (Carter & Little, 2007). In this sense, the first methodological challenge is related to the conceptual framework of this study: the assumption that knowledge is situated, continuously negotiated and mostly intangible. Participants are considered not only witnesses of climate change and passive recipients of climate-related information but also actors who actively make sense of climate change in dynamic and multifaceted ways. This methodologically challenging assumption is exacerbated by the features of the topic of climate change. That is to say, climate change as an abstract concept entails a variety of aspects, is often conflated with other issues, and has differing implications at societal, temporal and spatial levels. This

complexity calls for a method able to grasp the multiple levels on which participants develop climate-change meanings and the aspects perceived as correlated with it. Furthermore, climate change is widely perceived to be primarily a natural scientific entity (Barnes et al., 2013) wherein only certain scientific views are legitimate to investigate it. This proved a significant challenge as participants had to be directly and indirectly assured of the validity of their personal climate-change meanings to avoid collecting data based on what people expect should be said about climate change.

The third challenge of the present study lies in its cross-cultural nature. Authors have approached the problem of cultural differences in various ways, employing a wide range of both theoretical frameworks and methods (Milfont, 2012). In the context of climate change in particular, two main approaches can be found. The first belongs to the anthropological tradition, where investigation on cultural climate change is often carried out in the context of ethnographic fieldwork. These studies provide an in-depth analysis of how climate change is perceived by communities through cultural lenses and how climate knowledge is produced, reproduced and performed at the local level (Roncoli et al., 2009; Head et al., 2013; Crate & Nuttall, 2011; Norgaard, 2011). While these studies offer a detailed picture of different climate-change meanings, to date no research has focused on how different cultures of climate change coexist in the same place, which is the objective of the present study.

The second methodological approach to cultural differences can be found in environmental studies and geography, where cross-cultural perceptions of climate change are investigated through cross-national surveys. The present study offers an answer to recurrent calls to understand climate change culturally (Hulme, 2015) and to investigate how culture and climate change interact (Adger et al., 2013). Currently, the predominant body of literature concerning cultural understandings and perceptions of climate change results from literature reviews and quantitative comparative studies (Capstick et al., 2015; Lorenzoni & Pidgeon, 2006; Brechin & Bhandari, 2011; Wolf & Moser, 2011). This approach has the merit of bringing to light commonalities and differences in climate-change meanings from all over the world. Nevertheless, the approach fails to answer the question of how such meanings are formed and to reveal the role of worldviews, experiences and place in their formation. Furthermore, surveys and general quantitative methods are based on Western assumptions and in many cases

reflect Western mind-sets or scientific preconceptions. Yet, different interpretations and ratings by different cultures potentially lead to biased results and make cross-cultural comparison unreliable.

Returning to the present study and its aim, the difficulty of designing a method which is both consistent with the epistemological framework and effective in investigating culturally based climate-change meanings becomes clear. The following questions emerge:

a) How is it possible to investigate a construct such as climate change, predominantly framed as a natural science´s issue, from an individual perspective?
b) Which method provides access to the complexity of climate-change meanings and yet enables an analytical structure?
c) How is it possible to investigate and analyse cultural meanings in a culturally sensitive manner?

In the following section, I will reveal how I tackled these methodological challenges, by developing an innovative method. I first introduce a method called "Twenty Statements Test" and how I adjusted it to the topic of climate change. I then demonstrate how the qualitative interviews conducted were coupled with the test and played, at the same time, a crucial role in answering my research question(s).

2.2 Adapting the Twenty Statements Test to climate change: the Ten Plus Ten Statements Test

The Twenty Statements Test (TST) is a simple and straightforward method to collect data on individuals´ self-construal. In its original version (Kuhn & McPartland, 1954), TST consisted of a single sheet of paper headed by these instructions:

> "'There are twenty numbered blanks on the page below. Please write twenty answers to the simple question "Who am I?" in the blanks. Just give twenty different answers to this question. Answer as if you were giving the answers to yourself, not to somebody else. Write the answers in the order that they occur to you. Don't worry about logic or "importance." Go along fairly fast, for time is limited.'" (Kuhn & McPartland, 1954: 69)

The instructions given by Kuhn and McPartland to their survey participants (undergraduate students) were intended to guarantee spontaneous and free answers. The authors sought to elicit statements that revealed subjective self-definitions rather than expected and biased self-definition. Thus, the TST was designed to investigate self-construal; the method has been generated from and informed by theory. In the decade after Kuhn and McPartland´s publication (1954), studies that employed the TST were often informed by self-theory (Bochner, 1994; Brewer & Gardner, 1996), a trend which can be also found in recent works (Kanagawa et al., 2001; Carpenter & Pruit, 2008; Margola et al., 2011). As shown by a number of studies (Bond & Cheung, 1983; Cousins, 1989; Triandis, 1989; Markus & Kitayama, 1991; Hong et al., 2001), the test proved to be especially suitable for investigating how individuals belonging to different cultures differ in their self-image. Interestingly, in all referenced cross-cultural studies, the TST was carried out with participants from Chinese or North-American culture(s), as emblematic examples of independent and interdependent cultures. Apart from its predominant application in self-theory, the TST has also been employed in different fields and, in particular, in organizational research (Jung et al., 2009; Brickson, 2005). In addition to changes in the field of application, the TST has also been modified in terms of focus and format (Rees & Nicholson, 1994; Walker et al., 1996). The coding scheme introduced in the original version by Kuhn & McPartland (1954) was also changed by later authors who developed different and often more complex coding schemes (Kashima, 2001; Pritchard, 2012). The original and rather simple analytical approach based on the dichotomy of consensual/subconsensual (comparable with independent and interdependent culture) statements was substituted for new forms of coding based on different levels of self (Triandis, 1989), of abstraction (Hartley, 1970; Kanagawa et al., 2001), and varied from 9 (Cousins, 1989) up to even 33 subcategories for analysis (Rhee et al., 1995). While on the one hand, such a quantity and variety of coding schemes raised scepticism about the validity of the TST among some authors (Kashima, 2001), one might also argue that this is, actually, one of the outcomes, if not of the advantages of this test. The fact that this method is straightforward and allows flexibility in its application, in its interpretation, and in its format, resulting in different interpretations by different authors, is one of its main advantages.

For my own research, I took advantage of these features and adapted the TST to the research aim. More precisely: while I did draw on the basic approach of this method, I reinterpreted it and designed a different test structure, a different coding scheme, and, most importantly, applied it to the topic of climate change. By doing so, I went beyond the theoretical framework within which the TST is traditionally embedded (self-theory), and I made the most of its format to investigate climate-change perception. In the present study, the "Who am I?" question was coupled with climate change, leading to the development of what I call the Ten Plus Ten Statements Test (T+TST) (see Appendix A). Participants were first asked to fill in a blank page answering the question "Who am I?" with ten statements, and then they were asked to write ten statements on "climate change" on a second blank page. In both cases, the instruction included statements that prompted participants to answer spontaneously and stated that there was no "wrong or correct answer". As the T+TST was distributed in person, both in classrooms and in a one-to-one setting, it was possible to assure participants that responses would be kept anonymous. These remarks are necessary, as the main benefit of using the T+TST is its capability for eliciting spontaneous and free-associative answers. In order to be able to investigate climate-change perception in a truthful and open way, it is crucial that participants be allowed to express their own climate-change meaning instead of an expected one. Through the T+TST, participants were free from superimposed scientific definitions of climate change. Participants were provided with a blank sheet on which they were able to disclose their climate-change meanings in the forms of adjectives, single nouns or whatever statements they thought were appropriate. This freedom is of further relevance when considering the cross-cultural nature of the present research. As mentioned above, individuals with different cultural background might ascribe different meanings (and values) to surveys or certain quantitative research instruments, leading to biased results (Spector et al., 2015; van de Vijer, 2015). The format of TST, and consequently of T+TST, is reduced and simplified to the extent that the likelihood of importing or generating cultural bias is minimized. Consequently, data collected from the T+TST are comparable, even if carried out in different cultural settings.

The advantages of modifying the structure of TST into T+TST do not lie merely in the change of the field of application and the inclusion of the topic of climate change. Even if the "Who am I?" statements were not analyzed as a source of data in their own right,

they shed light on existing cultural differences and helped to reveal them. In particular, cultural patterns of self-image came to light. These are not of secondary importance, as self-perception has been shown to bear an impact on emotion, cognition and motivation, which in turn influence individual (environmental) behaviour (Cho et al., 2013; Gatersleben et al., 2014; Markus & Kitayama, 1991). Statements of self-image also inform the interpretation of climate change-related statements and of interview contents. In fact, the way that participants saw themselves also revealed their construction of the relationship between self and Others, their relationship with the earth and the environment, and their trust in institutions.

A second important advantage of employing the T+TST relates to the way that the "Who am I?" statements prepared a "subject-centred" ground for the second set of statements regarding climate change. The structure of the test allowed participants to familiarize themselves with the format and ground themselves in their self-image while answering the "Who am I?" question and then to be at ease in the second part of the test. Starting with a uniquely personal question and stimulating a certain amount of self-reflection focused attention on the participant and on his/her personal views rather than on the scientific topic under investigation. This helped to overcome the barrier between expert (interviewer) and non-expert (interviewee). The development of this procedure was of crucial importance for answering the research question of this study, which focuses on individual climate-change meanings.

2.3 Interviews

In the case of Chinese and Italian participants, the T+TST was followed by in-depth semi-structured interviews. In-depth interviews are a common research tool, widely used in qualitative research. They have been the prevalent method when the research focus is climate-change sense-making among individuals and/or communities (Nielsen & D`haen, 2014). By their nature, one-on-one interviews allow the interviewer to delve into participants' understandings of climate change, and by the use of iterative or successive questions reveal how those understandings are formed and what facets are inherent to them. The approach generates rich and context-specific data, providing valuable access to the multiplicity of climate-change meanings. It is, however, important

to highlight that the interview should not be understood as a "snapshot" of pre-existing, fixed or fossilised knowledge. On the contrary, an interview is a transformative process where knowledge is continuously produced and negotiated between the interviewee and the interviewer (Yeo et al., 2013, Dowling et al. 2016). This is of particular relevance with respect to climate change, which is itself a negotiated knowledge that includes different aspects (e.g. social, economic, ethic), and it encompasses both the individual and collective level, as well as both local and global dimensions. For the present study, it was crucial to allow the participants the freedom, the flexibility, and the time to negotiate such knowledge and to express his/her climate change images in an exhaustive manner. Given the focus on individual meanings, the interview provided the necessary opportunity to clarify ideas and aspects raised by the interviewee. This information, once collected, could be collated and analysed along with those previously iterated. In conclusion, semi-structured interviews made it possible to combine flexibility and freedom by providing guiding structure and allowing the interleaving of spontaneous questions with prepared ones (Clifford et al., 2010). A more detailed sample of the interview guide can be found in Appendix B.

In a further effort to avoid overlooking any of aspects mentioned by the participant or interrupting the conversation flow, the interviews were recorded and transcribed afterwards. This choice was also advantageous for the analysis, because intonation, and to some extent emotion, could be preserved for review.

In conclusion, the combination of the T+TST with in-depth interviews provided space for spontaneous and free-associative answers as well as for in-depth elucidations of climate change understandings.

2.4 Participants

After designing the research method, the subsequent challenge was to identify potential participants for the T+TST and in-depth interviews. Participant selection would play a decisive role in collecting meaningful data with which to answer the research question. As such, it was imperative to select a sample group that could not only reveal climate-change framings in general, but also bring to light the diversity of climate-change framings co-existing in the same physical space. In addition to these fundamental

characteristics, other more pragmatic issues had to be taken into account. In particular, time constraints, access to participants and language barriers imposed genuine limitations on the choice of participants.

After considering these conceptual and pragmatic issues, members of four migrant communities of Hamburg were selected: Italian, Chinese, Turkish and Peruvian. Among the largest of immigrant communities in Hamburg, these four groups also reflect diversity of geographical origin. These cultural groups hold divergent worldviews, which may influence their climate-change framings. In the case of Chinese and Turkish participants, two native speakers carried out the T+TST and interviews and supported me in interpreting and analysing the data. Finally, in the case of Italian and Peruvian participants, I was able to benefit from my language proficiency and cultural closeness to collect and analyse data. The results of the analysis of Peruvian sample will not be presented in my work. In fact, the method used to collect T+TST differed from the others, as data were collected in group and many participants focused on the "Who am I?" part of test skipping the part on climate change or communicating to each other in order to be sure to "answer correctly". While carrying out the study with Peruvian participants was an important step of my work and an enriching experience for me, I argue that its analysis would not fit with a comparison with the other groups and data collected.

In addition to these four groups, T+TST was used with German students at the University of Hamburg and with Taiwanese students at Taipei University. In this phase, instead of involving migrants I focused on local students. The choice of this focus was to analyse how culture play a role in climate change. In fact, the two groups belong to two opposite cultures but they share age and educational level. I describe the research process and results in detail in Chapter 4. Before turning to said description, I now discuss the selection criteria that I applied to find interview partners with an immigration background and the sampling techniques that I employed with both migrants and university students.

In the case of migrant participants, eligibility requirements were: 1) at least 6 months of residence in Hamburg, and 2) being first generation migrant (defined as foreign-born resident living in Germany). Both preconditions were intended to ensure sample

homogeneity in the sense of comparable contact with the physical and social environment of the immigrants´ country of destination, Germany. These requirements were also valid for the pilot study of this research, carried out between November 2013 and January 2014 with N=10 Italian immigrants living in Stockholm, Sweden. The pilot study allowed me to assess the format of T+TST coupled with in-depth interviews. Further, it permitted me to observe the average time needed for T+TST and for interviews, and to identify recurring issues addressed by participants. In sum, the pilot study confirmed the suitability and effectiveness of the methodological approach chosen and prepared grounds for the following phase of data collection.

Owing to the different groups involved in the Hamburg-study and the different contexts in which the T+TST and the interviews were carried out, different sampling techniques were employed. As laid out in Figure 2, the snowball technique and street random sample were employed with migrants in Hamburg, while a convenient sample was employed with students, in the second phase of the study. The different advantages and disadvantages of these techniques have important implications for the research results. The snowball technique consists in asking interviewees to suggest names of and even to put the researcher in contact with other potential interviewees who meet the sample criteria (Chaim, 2008). This technique obviously leads to involving participants belonging to same social networks and probably holding comparable views and interests. Nevertheless, this approach is particularly advantageous for identifying and locating participants in a context where they are not particularly “visible” or not the majority (Ritchie et al., 2003), as it is the case with migrants.

In the case of random street sampling, non-peremptory selection of participants leads to a non-targeted and potentially more representative sample. Nevertheless, finding participants willing to be involved in the study can be time-consuming and leave insufficient time to collect detailed information (Ritchie et al., 2003). In this study, the street random sampling was particularly useful when the T+TST was employed, as it is a quick and simple procedure. Furthermore, conducting the study in areas of Hamburg identified for their strong presence of migrants increased the chance of meeting eligible participants and reduced time-consumption concerns.

The third sampling method employed, the so-called convenient sample, allows the researcher to selects participants for their accessibility. For the present research, this

approach involved students of two universities belonging to different cultural contexts: University of Hamburg and University of Taipei. The obvious advantage of this approach is the time-effectiveness and easy access to participants. As a drawback, a convenient sample often fails to be representative of the average population. In this case, students differ from average populations in their collective youth and relatively high educational level (Robinson, 2014). While this limitation impedes broad generalization, it nevertheless enables practical comparison between two samples holding the same features but different cultural backgrounds.

GROUP		n	Age	Gender	Method	Place: date	Sampling method
Migrants	Italian	10	24-57	4 females 6 males	T+TST & interviews	Stockholm: November-December 2013	Snowball
		9	35-58	5 females 4 males	T+TST & interviews	Hamburg: September-December 2014	Snowball
	Chinese	18	46-26	14 females 4 males	T+TST & interviews	Hamburg: January - July 2015	Street sampling & Snowball
	Turkish	21	15-65	11 females 10 males	T+TST	Hamburg: July 2014	Street sampling
	Peruvian	14	35-80	11 females 3 males	T+TST	Hamburg: May 2015	Snowball
Students	Taiwanese	46	n.a.	n.a.	T+TST	Taipei: September 2014	Convenient
	German	46	18-35	32 females 13 males 1 n.a.	T+TST	Hamburg: January 2014	Convenient

***Figure 2: Overview of participants** of the present study. This table summarize the two groups of participants (Students and Migrants) in terms of country of origin, number of participants, age range, gender distribution, methodology employed, date, place of data collection and sampling method.*

Recognizing the positive and negative outcomes of each sampling technique encouraged me to employ and test different strategies with different groups, in different contexts and in different phases of research. This flexibility greatly expanded my access to participants from different cultural backgrounds and ultimately enriched the database due to its analytical depth the research process and results.
As a result of the diverse sampling techniques, it becomes important to provide specifics of participant characteristics. The following table provides information on participants´ age and gender, time and strategy of data collection as well as the method employed.

Detailed statistical data regarding the four migrant communities that are the focus of this study is not present in the scientific or administrative literature or not relevant to the scope of this study as they focus on migration as process rather than on migrants as individuals. However, in the next section, I outline the available data on the migrant population of Hamburg and then reflect on how such data support the relevance of and motivation for my work.

2.5 Migrants in Hamburg

The present study was carried out in Hamburg, one of the regions with the highest cultural diversity in Germany (Statistisches Bundesamt, 2016). In fact, according to the Statistisches Amt für Hamburg und Schleswig Holstein (2016b), at the end of 2015, 596,711 of Hamburg´s inhabitants were migrants as defined in Chapter 1 of this thesis. The significance of this number can be better understood when coupled with the awareness that those 596,711 inhabitants represent approximately 33% of the population. Among them, Turkish people represent the largest migrant community, while Italians occupy the ninth position (sixth in 2014 (Statistisches Amt für Hamburg und Schleswig Holstein, 2015)). For the aim of this study, it is relevant to report that in Hamburg there are N 92,745 (15.5% of migrant population) Turkish inhabitants and N 11,652 (2.0%) Italian (Statistisches Amt für Hamburg und Schleswig Holstein, 2016). Unfortunately, data on the Chinese population are limited to the “Ausländer” (foreigners with non-German citizenship), which amount to N 5,377 (Statistisches

Bundesamt, 2016b); as the Ausländer is by definition a subgroup of migrants, the real number to be expected is considerably larger. In the case of the Peruvian community, relevant data could not be found.

In reviewing statistical data on migrant communities in Hamburg, several items of relevance for this study emerge: 1) migrants' age distribution, 2) expected future trends, and 3) migrants' geographical distribution.

The first striking observation drawing on Hamburg´s population statistics is that 48% of young inhabitants (under 18 years of age) are migrants; in some areas that number is as high as 97% (Billbrook, Veddel). These data cannot be overlooked when dealing with climate change, as this and subsequent generations are those who will bear the brunt of climate change and the necessity of adapting to it (Corner et al., 2015). Consequently, the individual and cultural composition of the next generation is of primary importance for long-term climate-change solutions.

The second factor to be taken into account is the future trend of migration, which will affect not only Hamburg, but also Germany and Europe more generally. From 2009 to 2014, migrant population increased by 3% (n=80,000) (Statistisches Amt für Hamburg und Schleswig Holstein, 2015), a number which is expected to increase with the recent arrival of refugees. Thus, recognizing the variety of cultures and climate-change framings co-existing in Hamburg will be essential to designing adaptation and mitigation strategies appropriate to evolving social characteristics of the future Hamburgian society.

The third relevant factor is the geographical distribution of migrants in relation to the risk map of Hamburg. Overlapping Maps 2 with Map 1, show that areas such as Veddel, Wilhemsburg and Hammerbrook are both flood-prone areas and areas with the highest percentage of migrant population. The area comprising Veddel and Wilhelmsburg is also the subject of the IBA project (International Building Exhibition_2006-2013), an urban development project aimed at increasing this area´s climate resilience. Projects such as the IBA (which look at the future and tackle climate change through both mitigation and adaptation measures) cannot overestimate the importance of local inhabitants' support for those measures. While whether and how population with different cultural backgrounds might be involved in these projects is beyond the scope of the present

research, the analysis of population data and of migrant distribution in Hamburg clearly reveals the relevance of investigating cultural and migrants´ framings of climate change.

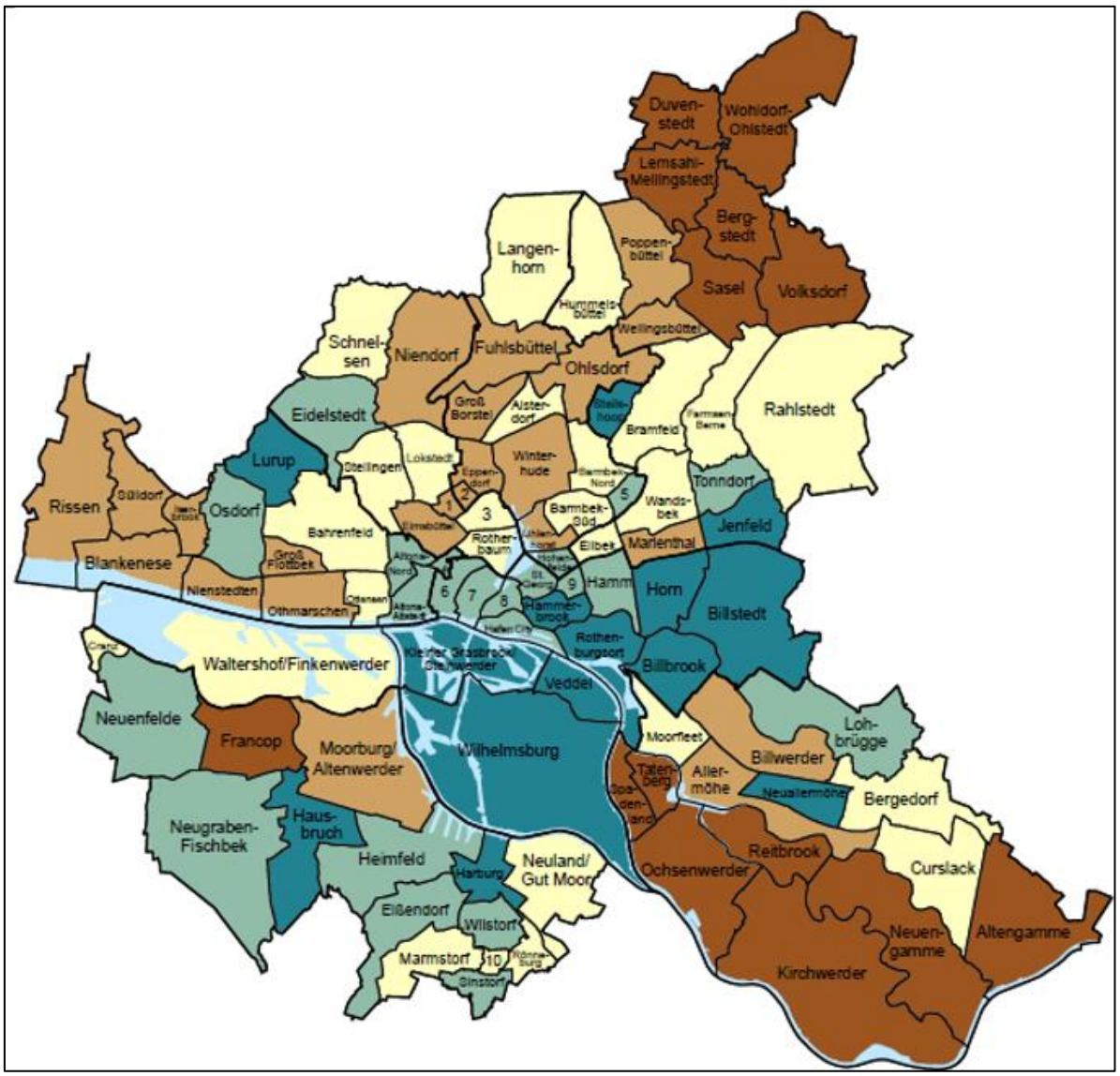

Figure 3: Distribution of inhabitants with migratory background in districts of Hamburg*. Dark blue: ≥44% of migrant population, Light Blue: 32 – 44%, Cream: 23-32%, Light Brown: 15-23%, Dark Brown: ≤15%. Source: Statistisches Amt für Hamburg und Schleswig Holstein, 2015.*

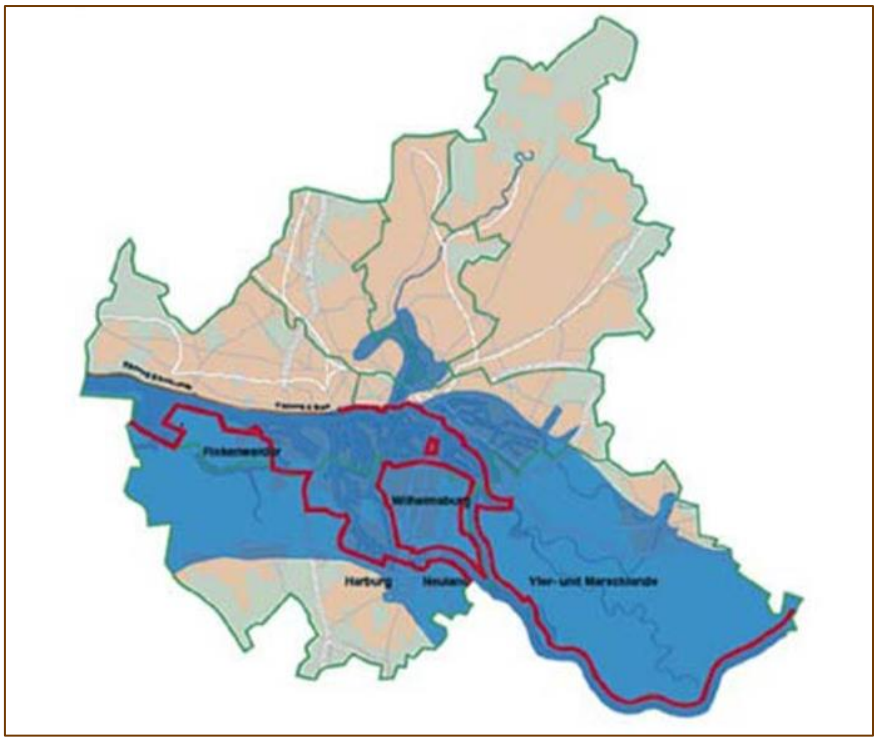

Figure 4: Flood risk area Hamburg. *In blue, flood-prone areas in case of no flood protection. In red: flood control lines. Source: Rose and Wilke, 2015. For a more detailed map, see Appendix C.*

2.6 Theoretical and positional reflexivity

While methodological decision-making stands at the beginning of the research process, at the end of it, a researcher must step back and reflect upon the method applied, the theoretical framework used and their appropriateness to the researcher's epistemological position in answering the research question. That said, it is also possible and equally important to reflect upon the method throughout all research stages, including method design and the research progress. Given the topic of my study, the problem of methodological nationalism has been, from the beginning, a substantial one. As I discuss in Section 2.6.1, I held it in mind while designing and performing the method and attempted to overcome by conceptual and methodological means. I also carried a second type of reflexivity through the research process: positionality, a factor of particular relevance in such qualitative and cultural studies as the present one. I review the role my positionality as an Italian, woman and scientist played in interaction with the interviewees and the research topic in Section 2.6.2.

2.6.1 Methodological nationalism

In the introduction, I addressed the definition of culture as strictly linked with the nation state. In my research, I deliberately employ the nation as analytical unit to study culture. Nevertheless, this approach should not be adopted uncritically as it might be considered as methodological nationalism: the study of social processes as defined and limited by national borders. This perspective does not leave room for internal differences within a country, the existing transboundary identities and social processes' dynamism in space and time. These and further limits of methodological nationalism are under particular scrutiny in migration research (Wimmer & Schiller, 2002; Nowicka & Cieslik, 2014), where “no one admits being committed to it, and yet its presence is allegedly found in every corner of the contemporary social scientific landscape” (Chernilo, 2011: 100).

In my research, the problem of methodological nationalism has not been completely resolved but I have separately addressed from a conceptual and a methodological point of view. From a conceptual point of view, my research responds to the problem of methodological nationalism by approaching the climate change-migration nexus as unfixed and unrelated to national boundaries. I break those boundaries and reveal that even within a nation there is not one homogeneous image of climate change but rather many cultures of climate change. The opposite approach can be found in current discourses, where climate change and migration are seen as cause and consequence, and where climate change-related migration is described as a security risk (Scheffran et al., 2012). These perspectives reproduce and reinforce the conceptual problems of methodological nationalism. In fact, these studies focus on national borders or territory for determining who is a “climate refugee” and who is not, and, therefore, cast migration as a negative social process.

From a methodological point of view, I do employ nation as equivalent to culture, but I also acknowledge that the two concepts do not conceptually coincide. In my view, cultures are not bounded by political borders. In fact, I recognize that a number of cultures coexist within the same nation-state and also that common cultural features might be found in geographical areas that belong to different nations. But I argue that even considering these aspects, it is still possible and meaningful to identify patterns of behaviours and of cognitive constructs within pre-defined national borders. These patterns do not exclude the complexity of cultures from a spatial and temporal

dimension, but for pragmatic reasons they have been analysed within national context. I believe that while reflecting on the problem of methodological nationalism is of paramount importance, it is also crucial to assess to what extent this theoretical issue can contribute or rather limit the research process. Considering my research aim, the conceptual approach and the existing methodological options, I decided to superimpose the nation state (and, in particular, Italy, China, Germany, Taiwan, Turkey, Peru) as analytical unit and as a framework of reference. In reducing the complexity from a methodological perspective, I may have placed certain limitations on the applicability of my research. However, as I discuss the entirety of the theoretical and conceptual framework of the study supports the opposite effect.

2.6.2 My positionality

Knowledge is subjective and situated: it is dependent on when, where and by whom it is produced. It is, therefore, important to dedicate efforts to investigating how the context and the actors involved (in this case interviewer and interviewee) might affect the knowledge production. Positionality acquires further relevance when the method employed is interviews, because in-depth interviews can be considered as a "dance in which both parties attempt to size up each other" (Ryan, 2015) and as "special forms of conversations" (Nowicka & Ryan, 2015). During interviews, both interviewee and interviewer contribute to knowledge production, relate with each other and negotiate their selves and their identity.

Migration scholars often describe the position of the interviewer (researcher) as either "insider" or as "outsider" (Carling et al., 2014). In this sense, the researcher is considered as an insider when s/he shares the cultural background of the participants. The position of insider has been considered fruitful and positive for the most part, as the researcher presumably speaks the same verbal and nonverbal language as the interviewee and is familiar with certain cultural expressions and complications which might arise during the interview. The dichotomy of insider/outsider has been recently questioned by a number of scholars who both deconstructed the idea of insider as inherently positive and advanced the concept of multiple positionalities (Ryan, 2015; Nowicka & Cieslik, 2014). According to this concept, the status of the researcher is not fixed, but continuously negotiated with the research participants; it may even be possible to be both insider and

outsider within the same interview. Such dynamism is strongly linked with the idea of intersectionality, which takes into account not only cultural background but also gender, education level, age, migration status and how all these aspects interact in the knowledge production. Ganga and Scott (2006) provide a clear example of the importance of intersectionality in their methodological reflection on qualitative studies with co-ethnic migrants in the UK and France. In their studies, being an "insider" paradoxically intensified the distance between the interviewer and the interviewee because social differences came more clearly to light.

In my research, the issue of positionality was particularly relevant with the two groups of participants with whom I conducted in-depth interviews. I had the privilege to be both an insider – in the case of Italian immigrants, and outsider – in the case of Chinese immigrants. While I could test how in certain cases my positionality changed during the interviews, it is also true that my position as Italian was predominant and it was mainly advantageous. The fact that I shared a cultural background with the Italian participants had a series of positive outcomes. The first consisted of facilitated field-access to the community, which created a relationship of trust and openness and accelerated snowball sampling. Furthermore, it also helped to break the ice at the beginning of the interview. The second important aspect was language, as not all immigrants were fluent in German. Generally speaking, using their native language allowed the participants to elaborate their topic, issues and answers in more detail. Finally, the third outcome of being an insider is the shared set of knowledge. Often, participants referred to Italian historical events, Italian politicians or more general cultural accountings. Being an "outsider" might have led to misunderstandings or even created barriers between the researcher and the participant, interrupting the interview´s flow. Holding the same knowledge and recognising the cultural references was positive but from time to time also challenging. In fact, it happened quite often that I had to work not to express my opinion or comment on the issue raised by the participant, so as not to bias his/her answers. In such occasions, I not only negotiated my identity but also, to some extent, adopted a new one, more or less in tune with the interviewee´s perspective. This factor deserves particular attention, as it is often thought that the interviewee and the resulting interview are shaped by the researcher's personal characteristics (e.g. women,

men, white, black). Yet the research process and the interviewee may also impact the researcher, which has for the most part been neglected in the literature.

During interviews with Italian participants, I encountered one main obstacle: being considered an expert. This is, most likely, related to the insider/outsider dichotomy only to a certain extent, as the topic of research – climate change – is considered a scientific topic, about which it is perceived that only experts may legitimately talk about. This created a distance between the interviewee and me, as they often did not feel informed enough to talk about the topic and may even have felt judged for their non-scientific knowledge and arguments. This obstacle was a recurrent one. I tried to overcome it by reassuring participants that there was no wrong answer and that I was interested in their perspective. By such means, I attempted to redirect attention towards them and their knowledge, and I showed empathy and interest.

During interviews with Chinese participants, I experienced the status of an outsider. Interviews were carried out by another scientist, a native speaker and insider, while I carried out the analysis of the transcripts. As an outsider, I was sometimes unable to delve into certain discourses and references. And, too, I was often concerned with misinterpreting the results due to my Western perspective. As highlighted in Chapter 3, the first step to overcoming this problem was a literature review of Confucian and Daoist philosophy and Chinese epistemologies. Furthermore, in order to promote culturally sensitive analysis, I availed myself of the aid of Chinese-culture insiders, Professor Dr. Wen-Cheng Wang, Qian Jiang and of Dr. Martin Döring and Professor Dr. Beate Ratter. These collaborative efforts, which involved both outsiders and an insider of Chinese culture resulted in a constructive and enriching reflection on the results, which, therefore, avoided generalization, presuppositions and western-centric interpretations.

From my perspective, it is fundamental to execute an in-depth exploration of the role played by the researcher's positionality in knowledge production of climate-change meanings. In my case, reflection permitted me to not only contextualize the results and reflect upon the advantages and disadvantages of being insider and outsider, but also observe how the research processes shaped me and the data I generated. With that in

mind, I turn to the first set of empirical results, those dealing with the cultural constructs of climate change among Chinese and Italian migrants in Hamburg.

Chapter 3

Cultural constructs of climate change among Italian and Chinese migrants in Hamburg

A number of studies investigate climate-change perception around the world (Wolf and Moser, 2011; Ratter et al., 2012; Howe et al., 2012). This body of literature has the merits of discussing global trends, cultural differences and similarities in understandings of climate change across time and space. Nevertheless, these studies fail to explore the variety of cultural cognitive structures that inform climate-change sense-making. As discussed in the introduction to this dissertation, an analysis of migrants´ framings of climate change affords the opportunity to bring to light the role of culture and different climate knowledge(s) that ultimately shape climate behaviours. Such an approach is so far missing in academic literature. A small but significant number of scholars, however, are challenging the idea of migrants as victims of climate change in favour of migrant as agents of climate change. For example, Sakdapolrak (2014) stresses the pivotal role that migration plays in fostering social resilience to climate change. In a similar vein, Klocker and Head (2013) call for recognition of culturally diverse practices of environmental sustainability, and also argue for avoiding "reductive and essentialising" framings of ethnicity and sustainability.

My research builds on and expands this body of literature by investigating the different knowledge dimensions and structures underlying the perception of climate change among Italian and Chinese migrants in Hamburg (Germany). To do so, I analysed both the content of the interview, and the linguistic forms employed to express climate change meanings. On an ecolinguistic understanding, language is not a self-contained entity that helps to frame climate change, but is rather a culturally embedded structure that dialectically shapes and is shaped by the outside world. Against this theoretical backdrop, the language of migrants represents an analytical unit which can help to reveal the framings and worldviews nested in their cultural conception of climate change.

In this chapter, I first introduce and illustrate the process from collecting data to interpreting them. Next, I examine and discuss four prevailing categories found over the course of the study while Section 3.6 summarises the findings and reflects upon their theoretical and methodological implications. I conclude with an in-depth discussion of place attachment, an issue that has begun to garner increasing attention from scholars for its role for climate-change framings and engagement. In this segment, I draw upon the existing literature to conceptually explore how multiple place attachments and place identities among migrants hold the potential to contribute to current research.

3.1 Analytical process: detecting patterns and establishing categories

Analysing migrant's perception of climate change holds at least two methodological challenges: culturally sensitive data-gathering and in-depth interpretation of that data. The qualitative method of semi-structured interview provided a means to meet this double challenge. In this phase of my research, I focused on the Italian and Chinese communities as most divergent from each other in their worldviews and their involvement in the discussion of climate change and migrants. The interviewees were 9 Italian (3 women and 6 men, age range: 35-59, length of residence: 2-40 years) and 9 Chinese migrants (8 women, 1 man, age range: 26- 46, length of residence: 2-23 years). These two groups were interviewed in order to develop a contrasting data-set based on the assumption that members of individualistic (independent) and collective (interdependent) societies hold converging but also diverging climate-change framings. In order to secure the entrance to the migrants' community, minimise language barriers and provide cultural sensitivity, each interview was conducted by a native speaker in her migrant community. Most of the semi-structured interviews lasted between 30-45 minutes and started with the open question, what is climate change for you? This initial question was followed by questions that build on each other such as What are the impacts of climate change? What are the causes of climate change? What measures could be taken to tackle climate change? Who is in charge of dealing with climate change? What sources of information do you use to know more about climate change? How would you assess the quality of information? and finally Is there anything more you would like to add to or comment upon in what we have been discussed? All interviews were transcribed by the native interviewer, who had both a background in geography

and previous experience in conducting interviews. The translation into English proved to be difficult as many of the Chinese notions and their underlying semantic concepts cannot directly be translated into Indo-European languages. The translation of Chinese interviews consequently followed the logic of a grammatically correct verbatim translation which was complemented by comments explaining the meaning of certain phrases to ensure intercultural understanding.

After the transcription, a double-looped culturally sensitive analysis (Figure 5) was applied and data interpretation followed an adjusted interpretation scheme in order to avoid imposing stereotypes. The interpretation scheme first included the development of categories following the requirements outlined by grounded theory (Charmaz, 2006; Corbin & Strauss, 2008). Although the first results might suggest that there are considerable overlaps between the overall Chinese and Italian framings of climate change, significant differences exist in the linguistic structure of different categories. Thus, the second step consisted in a fine-grained analysis of the language deployed in each category. This analysis was accompanied by the reading of scientific literature dealing with environmental ethics and the role of Daoism and Confucianism in contemporary China as background information. The results were then presented to the native interviewer for critical inspection. By this means, I endeavoured to avoid over-interpretation and the ascription of stereotypes. The expert discussion of the categories and their internal structure, in effect, confirmed some results while it prevented over-generalisation in others. The overall approach proved to be a fruitful way of engaging with the interview material in a methodologically sound and culturally sensitive way. The final step of the analysis consisted of selecting the qualitatively and quantitatively most salient categories for our analysis. General framing of climate change, causes and consequences of climate change, responsibilities for climate change and typical measures of mitigation and adaptation appear to be the most important categories for the scope of the analysis, as they provide the best insight into the convergences and divergences between Chinese and Italian ways of framing climate change.

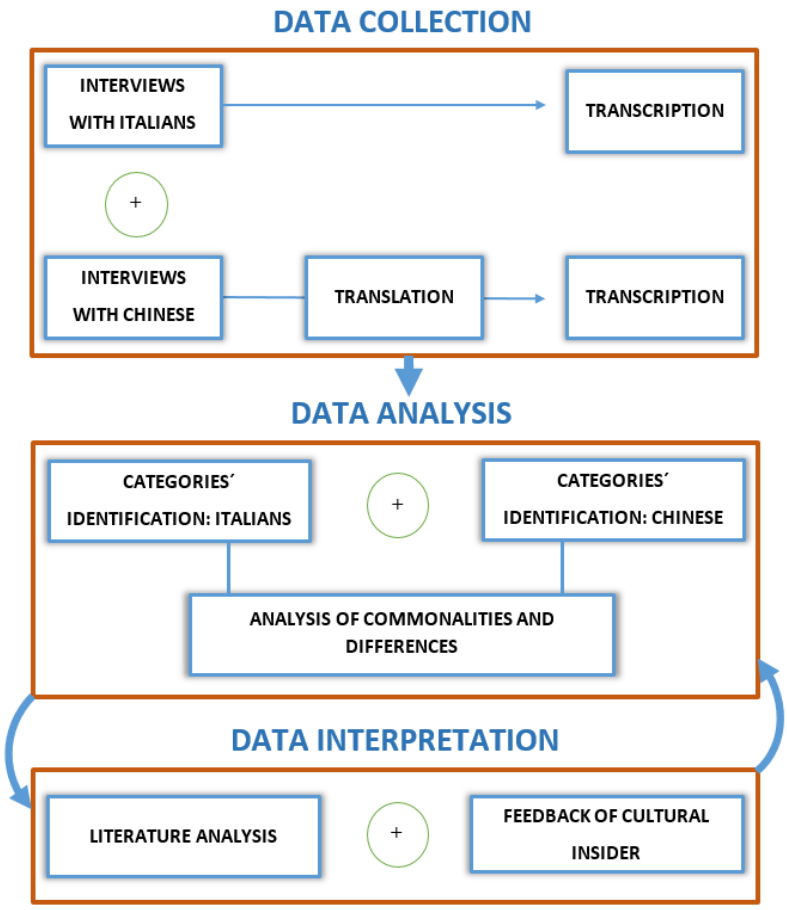

***Figure 5**: **Double-looped culturally sensitive analysis**. This table graphically represent the three phases of the analytical process: data collection , data analysis and data interpretation.*

3.2 General framings of climate change

To introduce the analysis of the main categories encountered, I begin by illustrating how participants of this study referred to the general framing of climate change in the interviews. Due to the abstract, scientific features of climate change, people seem to appeal to salient, concrete and experienced phenomena to make sense of it. Taylor et al. (2014), for example, carried out a survey in the United Kingdom which showed that participants correlated climate change with atypical weather patterns and in particular with hot and wet weather-related events. Capstick and Pidgeon (2014), on the other hand, focused on cold weather events and their ascription to climate change among United Kingdom citizens. Notwithstanding the different focus of the phenomenological aspect of climate change, both surveys agree on the relevance of perceived correlation of climate change with weather change to make climate change less abstract and more

familiar. These quantitative results are in line with findings based on the interviews carried out in the present study. In particular, for both Chinese and Italian participants, changes in seasonal temperatures and increasing rainfalls were considered expressions of climate change:

1. “In summer it rains so much, winters became mild. There is no more the cold there was before” (2.IT_HH).
2. “What I can feel is that in recent years, the winter is getting colder and colder and the summer is getting warmer and warmer. The springs and the autumns are getting shorter and shorter. That’s the climate change that I can feel” (7.CH_HH).

Yet, there are some differences in the choice of the typical phenomena perceived to be related to climate change. Some of the Chinese interviewees refer to tsunamis and earthquakes:

3. “Then there are unusual earth crusts collisions. Tsunamis, earthquakes are happening more and more frequently” (7.CH_HH).
4. “It directly influence our lives! For example tsunami and after (…) the sand storm in Beijing”(3.CH_HH).

Interestingly, and in accordance with research carried-out by Toan (2014), Semenza et al. (2011) and the UNESCO (2014), tsunamis, earthquakes and typhoons are identified as related to climate change. Unfortunately, too often scholars overlook these results by simply classifying them as misconceptions of climate change. To the contrary, they play a pivotal role for people with no scientific background in rendering climate change more understandable and immediately relevant. These are not misconceptions but rather knowledge reservoirs of “events that are recent, unusual, […] personally experienced” and meaningful (Taylor et al., 2014: 2). Hence, in our case study, these phenomena are indications of climate change belonging to the collective memory of the Chinese community in Hamburg. To refer back to the Sonnenfeld model (1972) discussed in Chapter 1, these phenomena belong to the previous geographical environment of migrants (the country of origin) and are transported to the perceptual environment of the hosting country (Germany).

This first insight into people´s general framings of climate change instigated a reflection upon the importance of analysing cultural constructions of climate change from a neutral perspective (as much as possible). To be effective, researchers must refrain from scientifically legitimated judgments and undertake to consider the cultural elements shaping individuals´ understanding, definitions and assessment of climate change. This also applies to the next section, where I illustrate and interpret converging and diverging perceptions of causes and consequences of climate change. Supported by the scientific literature, I will explore the role that Chinese and Italian patterns of meaning of climate change are deeply shaped by philosophical world views.

3.3 Causes and Consequences

In addition to questions of what represents climate change, interviews addressed its causes and resulting consequences. When asked, both Italian and Chinese interviewees intuitively referred to CO_2 emissions and a variety of typical anthropogenic causes such as driving cars. However, one of the advantages of interviews is the process of reflection that can be instigated, which in this case led interviewees to specifically refer to civilization and industrialisation as main causes for climate change. These concepts were refined with individual experiences and moral values during the interview. This becomes particularly apparent in the following quote, in which an Italian migrant offers an almost all-encompassing explanation for the causes of climate change from the perspective of his/her own behaviour, and includes strong reference to climate justice:

5. “The causes are the excessive use of energy and its uneven distribution at a global level. […] We have houses that, in the global distribution of resources, are shameful as in the end, me, I live in a house which is irresponsible to the energy need of an average world citizen” (9.IT_HH).

What can be seen here is first, a moral argument addressing the idea of climate justice and, second, a critical self-evaluation. The conceptual merging of global and local scales against a cause and consequence image-schema (Johnson, 1989) blends the global into the local and vice versa and, implicitly, establishes an explanatory relationship between an individual actor and climate change. One Chinese interviewee, on the other hand, stated that climate change takes place:

6. “[...] because of industrialization. Because industrialization has caused air pollution by emitted gases from cars, for instance. I think it’s the big problem brought about by modern civilization” (10.CH_HH).

This statement is based on the same cause-consequence schema as the previous one. It could, thus, be concluded that both Chinese and Italian migrants identify industrialisation and civilisation as causing climate change. But at a closer look, an important distinction can be found. In the case of Chinese interviews terms such as “industrialisation”, “civilisation” remain on a generic level and are not individualised. This contrasts with the recurrent cause-consequence schema encountered in the interviews undertaken with Italian migrants, which are characterized by a certain degree of individualisation. The use of compounds and adjectives such as “excessive use”, “shameful” and “irresponsible to the energy need” express criticism and individual moral scruples. In the Chinese interviews comparable structures and the individual dimension are simply absent.

In addition to the degree of individualisation of perceived causes, clear differences exist also in the identification of climate-induced consequences. On one hand, Italian migrants highlight climate-induced migration, and, on the other, Chinese migrants emphasise the negative impact of climate change on the economy. It is likewise interesting to observe how these results compare to recent surveys of the general population of Hamburg (Ratter et al., 2012) which identified storm surges as the main hazard of climate change. These results show a variety of ascribed meanings of climate change existing within the same physical space, thereby revealing the importance of culture in climate-change perception.

Returning to this study, as previously mentioned, Italians identify climate-induced migration as an important social consequence. For example:

7. “It [climate change] will cause only few human lives [...]. And then even if the water will rise some centimetres the consequences will be quite bearable. But what is strongly happening is the issue of populations in lands where they cannot survive due to this climate change” (1.IT_HH).

The natural impacts such as sea level rise are here depicted as manageable, while the probability of climate-induced migration is metaphorically estimated as strong ("strongly happening"). In spite of this recurrent refrain, in previously published surveys, climate-induced migration does not appear as a main consequence (Lorenzoni & Pidgeon, 2006; Eurobarameter, 2009). One explanation for this curious absence may lie in the importance of experience, personally relevant and familiar events to make sense of climate change. In particular, events around the island of Lampedusa and the massive Italian media coverage on drowned refugees along its coasts, might have become anchors of meaning for some of the interviewees. This part of Italian contemporary history might have shaped Italians´ understanding and representation of migration and climate change and thus becoming part of climate change framings.

In contrast to these framings of climate-induced migration as consequence, Chinese migrants thematically emphasise the consequences of climate change for the economic sector. Quotes like the following appear quite often in the interview transcripts. In most of them, a more or less holistic perspective on the cause and consequence relationship between and the economy can be detected.

8. "Like oil price, commodity price, have some relations with the climate. There must be correlations, if this year there is a severe drought, then the production of wheat will be less, the price will for sure increase" (7.CH_HH).

9. "It did not rain, then the surface runoff decreased and consequently the underground water was reduced. We had less water in the city´s storage and so we did not have enough water to use (…) If there is no water, the vegetables and fruits won´t grow. Then, the prices of these products will increase"(4.CH_HH).

What becomes apparent in these and other statements is a specific mind-set that is based on the idea of mutual interrelatedness and the chain-effect system of thinking (Pan et al., 2013). As a consequence, the focus lies on the impact of climate change on the functional relationship between objects rather than on the objects themselves. As investigated by Nisbett (2003), Xia and Schönfeld (2011) and Kuo (2011), 'Easterners'

and ‘Westerners’ differ substantially in their conceptualisation and interpretation of phenomena such as climate change. While Westerners’ atomistic approaches tend to focus in on one or more objects and their impact on a process (Figure 6), Chinese migrants in Hamburg display a holistic approach, starting with the all-comprising phenomenon and focus on the relationship between objects and the changes they bring about (Figure 7). This difference is reflected in the discursive structure of the Chinese interviewees that explicitly emphasise the interrelation between oil price, drought, climate change and the consequences it brings about. Contrastingly, the Italian quote focuses on single and independent objects such as temperature, sea level rise, migration and their impact on climate change. As a preliminary result, one could conclude that holistic and atomistic mind-sets conceptualising causes and consequences affect the Chinese and Italian ways of framing climate change. These same cultural models of thinking also inform concepts of responsibility, adaptation and mitigation, as I discuss in the next section.

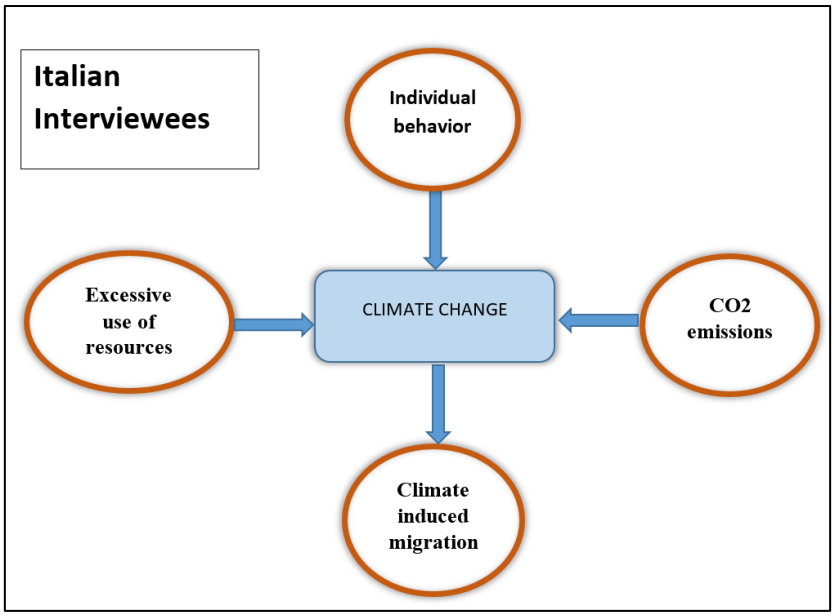

Figure 6: *Italian atomistic framing of climate change. This figure represents Italian and more broadly Western´s trend to conceptualize process by focusing on single objects.*

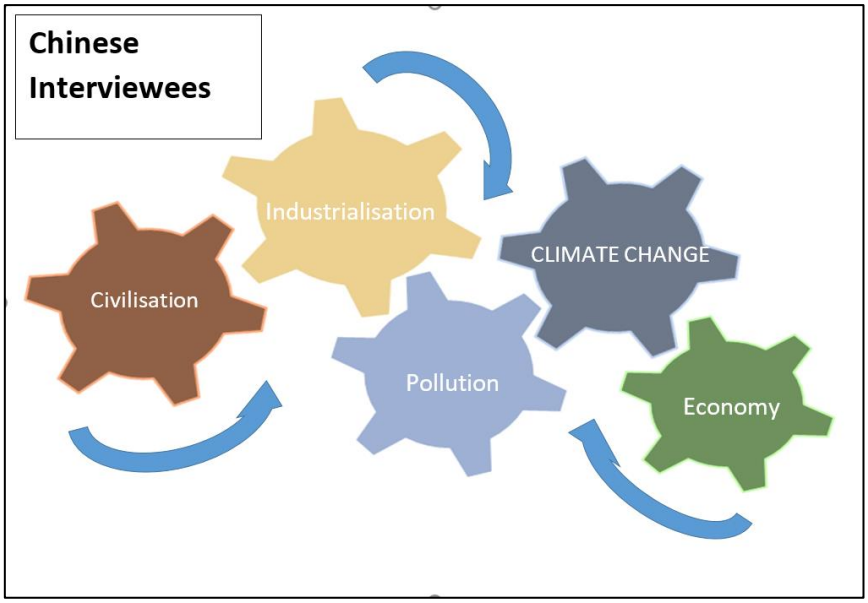

Figure 7: *Chinese holistic framing of climate change. This figure shows Eastern´s approach to processes in terms of relations between the objects. Everything is cause and consequence in an indissoluble cycle.*

3.4 Responsibilities of climate change: a matter of trust?

In the Western tradition, concepts of causes and consequences are closely connected to the idea of individual and/or collective responsibility (Nisbett, 2003). In brief, the agent who instigates a process has not only to cope with the outcomes, he or she is also morally accountable for them. On the other hand, the Chinese notion of responsibility is based on a complete different rationale with regard to the conception of the 'I'. In Chinese philosophy, the influence of Confucianism (van Ess, 2009; van Ess, 2011), in which the self is conceived as a part of a larger organic whole between heaven, the earth and humanity, can still be detected; the individual is related to and constituted by the interrelation with these contextual elements. In brief, the self has limited power and authority to take responsibility. Only wise men hold the capacity to understand the whole and can legitimately make decisions and suggest actions or measures to be taken. The individual thus has different dimension than in Western ideas of self. This becomes apparent in the main bulk of the interviews. For example, one Chinese interviewee affirms that "[...] we have been taught that one individual is very insignificant" (9.CH_HH). Such culturally engrained assumptions about the impossibility of individual competency have clear ramifications for acting against climate change. If the individual cannot be held morally accountable, he or she may also perceive his or herself unable to take effective action.

In their review of global perceptions of climate change, Wolf and Moser (2011) discuss the role of personal and collective responsibility in people´s framings. In so doing, they analyse both studies that look at how people feel responsible in terms of emissions and studies about perceived responsibility to actively engage to tackle climate change. She argues that external factors such as communication and context influence the feeling of responsibility and, therefore, define whether a person should act or not. My research offers a slightly different approach to the question of responsibility by analysing how the feeling of being responsible for something is a strong cultural construct.

Transcripts of interviews carried out in my research show that Chinese interview partners mainly reject individual responsibility and assign it to the government that is in charge of finding solutions:

10. If you “want the masses to do something, then the government has to push it. […] The masses, […] they need the government to function as a platform to guide them! “(5.CH_HH)
11. “If government and city planning departments act, it would be more efficient. Not only for the people aware of the problem, but also for those who are not. To make them realize “OK, I need this” (3.CH_HH).
12. “It should be the government to act. Because it involves so many actors, money, human resource, technology” (4.CH_HH).

In the above quotes phrases such as “pushes the masses” and “guides” reflect both a sense of hierarchy and a sense of trust. This might be better understood considering the Confucian conception of a government based on a powerful, leading figure who possesses superior wisdom and provides moral guidance (Shi & Lu, 2010). In addition to the cultural attitude towards hierarchy, a further issue to take into consideration is the strong interpersonal trust that characterizes interdependent Chinese culture and that, according to some authors, might be translated into institutional trust (Yang & Tang, 2010).

While Chinese migrants tended to locate responsibility with the government, interviews with Italian migrants exhibited a belief in individual responsibility for climate change. By contrast with Chinese understandings, Italians frame government as a separate entity or as an untrustworthy and self-centred caste that does not represent citizens’ interests. This finds resonance in literature that explains the well-known Italian public’s lack of trust in government as both a lack of satisfaction with the political-administrative system and a lack of trust in politicians as individuals (Facello, 2010).

13. “At the end, every person is responsible. So I think I had my stake in the change, in a negative way but also, in the last years, [...] I know I am contributing positively. [...] Who has the power in their hand, instead of taking care about their [politicians'] own pockets; they should do what they [politicians] really are supposed to” (3.IT_HH).

Two different ideas can be shown in this quote: first, the concept of the self as the unit responsible for acting against climate change; and secondly, the sense that politicians as

a social group are corrupt, which is linguistically expressed by the metaphor “care about their own pockets”. In essence, this Italian speaker postulates a pro-active self who takes over the responsibility of the irresponsible government to tackle climate change.

The previous quotations provided evidence for different philosophical traditions and cultural patterns structuring the concept of responsibility and the self with regard to climate change. In this context, climate change is not only constructed via a restricted range of cultural reservoirs, but also informed by underlying worldviews and philosophies. Ignoring these aspects engendering the concept of responsibility would actually mean to miss entry points towards culturally contextualised approaches of climate change mitigation and adaptation.

3.5 Adaptation and mitigation measures

Having analysed the culturally embedded concepts of responsibility in Italian and Chinese migrant interviews, I turn now to their preferences for and understandings of adaptation and mitigation measures. From the interviews, it appears that knowledge about climate-related issues arises from a combination of worldviews imported from the home country and new practices encountered in the hosting country. More precisely, migrants’ past memories interact with present practices encountered in the hosting country. This integration, which obviously affects ideas about measures of mitigation and adaptation, also surfaced in interviewer-interviewee discourses meandering between references to the home and the hosting country. As such, preferred solutions for dealing with climate change can be deduced and at least two lessons can be learned.

The first lesson concerns the fact that among migrants, the hosting country, in this case Germany, tends to represents a role model for “best practice” with regard to adaptation and mitigation. Emami (2012) shows that such idealisation might be considered as a devaluation or even rejection of the country of origin. My results, however, exhibit a genuine admiration for the hosting country that becomes a source of inspiration. This is also reflected by fairly emotional statements (“I am very proud”) that appeared in the interviews.

10. “I am very proud on what Germany is doing, that they closed the nuclear power plants, they are starting producing wind and solar energy” (2.IT_HH).
11. “I feel Hamburg is doing a good job in high technology. Compared to my home, I rarely see heavily polluting industries here” (4.CH_HH).

The closing down of facilities such as nuclear power plants were, in many cases, used as narrative starting points to positively depict the German turn towards a more climate-friendly energy policy. While this idea quite often emerges in the context of the Italian interviews, Chinese migrants develop a different line of argument: environmental protection is framed in terms of mitigation. Consequently, practices such as the recycling of plastic bottles and reducing water waste are conceived as mitigation measures:

12. “One thing I feel very good is that in Germany, they recycle plastic bottles and cans. […] Before people just thrown them away, into the trash bins [...]. I think similar actions should be promoted in China [...]” (3.CH_HH).
13. “If everybody uses less amount of water, the water storage in the city will be saved. When there would be a drought, there would be more water stored, then there would be much less efforts to look for a new resource” (4.CH_HH).

Remarks such as this one demonstrate, besides the fact that they consider new-country practices retro-applicable to the home country, a way of conceptualising mitigation based on a relational approach to problem solving: human behaviour helps to keep the environment in balance with the other elements of the organic whole. Against the backdrop of a concealed Confucian mind-set, mitigation is thus interpreted as a means to achieve balance and harmony by environmental protection. This discursive strategy stands in contrast to the Italian framing of mitigation which is based on categorical and functional relationships. Despite these differences, for both Chinese and Italian migrants the city of Hamburg and Germany, as a whole, acted as paradigmatic reference points for a good mitigation-oriented climate-change policy.

The second important lesson to be learned touches upon the cultural understanding of nature, which has important repercussions on choice and social support for mitigation

and adaptation measures. As already seen, Confucian philosophy provides significant though unconscious interpretation frame for mitigation and adaptation among Chinese migrants. Technology also plays a vital role, as it is seen to be a decisive tool for re-establishing environmental harmony. It appears that within migrant Chinese worldview, technology is not interpreted as the opposite of nature or the cause of environmental problems, but rather as contributing to the solution of such problems. This explains why most of the interviews contain relational discourses infused with technological references ("drainage system" or "filter systems" (4.CH_HH) or regulating practices ("restrictions shall be given" or "production shall be reduced" 4.CH_HH). Here, the same interviewee (4.CH_HH) explicitly claims that once a certain degree of technological development is achieved, fewer resources will be exploited, finally resulting in better environmental conditions:

14. "I feel that environmental problem is also somehow a technology problem. Because sometimes, for emit something, if your technology reaches a certain level, then maybe the toxic elements inside the emissions will be reduced. […] If you don't have the technology to reach the efficiency, you will need more raw materials, and then yes, you will emit more" (4.CH_HH).

In order to thoroughly frame these quotes, one needs once more to read and interpret them through a culturally sensitive lens. Confucian environmental morality tends to present nature as an entity that should not be exploited or manipulated (Callicott & McRae, 2014; Hourdequin & Wong, 2005; Weiming, 2001). Thus, human beings have to respect nature and assist for the maintenance of harmony among the different parts constituting the world (Kohn, 2009; Kuo, 2011). An interviewee, emblematically states:

15. " I think [climate change] is a process of human and nature adapting to each other". (4.CH_HH)

Within this perspective, technological advancement is seen as part of the organic whole belonging to the human sphere; hence, technology is not conceived as counterpoint to nature. This conception is the consequence of the central relevance that harmony plays in Chinese cultural traditions. The core value of unity of man with nature encompasses

all human activities, including technology that can and should be integrated with nature to achieve harmony (Chen & Wu, 2009).

Different cultural concepts of mitigation and adaptation emerged over the course of the analysis that also affect the understanding of the respective concepts and exert an impact on the measures to be taken. The Western tradition of framing climate change contrasts with Asian way of conceptualising it. While the former is based on a rationale that separates nature and culture and requires man to subject nature to his will, the latter does not strictly separate nature from culture and emphasises human assistance of nature for the sake of harmony. In summary, culturally different backgrounds and moralities lead to different understandings of nature and technology which in turn inform different concepts of mitigation and adaptation.

3.6 Cultural differences as opportunities: theoretical and methodological implications.

Looking back at the spectrum of results, they suggest that unconscious climate change worldviews exert a vital impact on the conceptualisation of climate change and on the preference of certain mitigation and adaptation measures. This aspect became particularly visible in the analysis of causes and consequences where underlying Western (atomistic) and Eastern (holistic) worldviews emerged. It was shown that Italian migrants hold the tendency to primarily analyse objects as separated from the context and on the basis of categorical membership, while Chinese individuals acquire meaning on intertwined causes and consequences once they are contextualized and related with other objects. Another important aspect revealed in our study was the role of the self-concept and its relation to the responsibility of government and government authorities to tackle climate change. Here, two divergent concepts emerged in the course of our study: the powerful and wise government combined with a weak “self” in the Chinese interviews stood in contrast to the Italian perception of an untrustworthy government where the individual has to accept and shoulder responsibility. Finally, ideas of technology as a means to understand and fix the un/controllability of nature considerably diverge: in the Chinese interviews, technology is interpreted as an integral part of nature and thus can be used as a tool to support it, whereas Italians frame it as

a separate category that has significantly contributed to the corruption of the atmosphere.

Besides these empirical results, there are also conceptual repercussions on the scientific discourse as the nexus of climate change and migration is in many cases scientifically framed in terms of threat for the hosting country. The present results indicate that this nexus requires a thorough methodological approach to overcome cultural stereotypes and oversimplifications. The approach applied here, with its inbuilt analytical loops of control, reflexive checks, assessments of results by written sources of interpretation and with the help of native experts, helped me to avoid misleading over-interpretation and stereotypes; it enabled me to reconsider the passive roles ascribed to migrants in the scientific literature and interpret them as active members of society. The awareness that different knowledge(s) and worldviews saturate the framing of climate-change adaptation and mitigation not only suggests how the migrant population might be encouraged to support certain measures, but also holds the potential to develop culturally sensitive means to deal with climate change in the hosting country. This important social potential has been almost completely neglected in the scientific literature.

As seen in the example of the self in Eastern cultures, a Westerner might at first glance see a communication problem: how to introduce climate-friendly measures if a person believes the self too small and meaningless to initiate change. Undoubtedly, this represents a challenge but the solution is to approach the issue with empathy. Instead of asserting the individual as a nexus of power and duty, one might think about the opportunities adding a collective dimension might offer. Such empirically based observations encourage the exploration of migrants' knowledge(s), as well as reflection upon one's own culture and on its role in shaping climate-change framings. As such, the methodological and theoretical aspects outlined here along with the results represent an attempt to find ways to explore the social and cultural dimensions of climate change through science *and* in society (Hulme, 2013). More specifically, they help to reconsider and assess the role of migrants and their possible contribution to mitigating or adapting to climate change in their hosting country.

3.7 Beyond the empirics: climate change framings, place attachment(s) and migrants

Throughout the interviews with Italian and Chinese participants, the home country manifested itself in the participant´s choice of meaning anchors and in the worldviews that informed climate-change framings. These constructs are part of the cultural baggage that each migrant brings along. In a migrant´s cultural backpack, direct and indirect experiences, along with memories of the home country form the cultural lens through which the new physical and social space of the hosting country is viewed and interpreted. In the case of my research, cultural understandings of nature and technology, of government and of the self, experiences of earthquakes and pollutions are examples of knowledge repertoires from which participants drew to make sense of climate change in Germany.

Another aspect of the influence of the hosting and origin country did not explicitly emerge in the interviews: the role of place attachment(s). While the method and context of my research do not permit focusing on it, there is a growing body of conceptual and empirical work that explores the pivotal and complex role that place attachment plays in both climate change perception and engagement. Yet, to my knowledge, no scientific effort has been devoted to investigating migrant´s place attachments as a constitutive part of their climate-change framings.

As such, it is useful to review existing literature on a) place attachment among migrants and b) place attachment and climate change. Afterwards, I close the chapter by sketching the conceptual overlap between these two topics of research, along the way introducing some still unresolved questions.

Place attachment is “made of place, space, memories and representations of past, present and visions of the future” (de Guttry et al., in review). This definition draws on the concept of place, a longstanding geographical concept that “differs from related concepts such as ‘space’ or ‘environment’ in describing physical aspects of a specific location as well as the variety of meanings and emotions associated with that locations by individuals or groups” (Devine-Wright, 2009:427). These two ideas provide a key for understanding the importance of investigating place attachment among migrants and of migrants’ place attachment and climate-change framings. In particular, place

attachment as defined (de Guttry et al., in review) encompasses not only the emotional and physical components, but also the role of different temporal dimensions. In the case of migrants, the physical space where memories were formed in the past (country of origin) does not correspond to the lived and imagined space of the present and future (hosting country). Such a mismatch and the resulting intertwining of attachment to the home place and place-making in the hosting country is investigated in a number of studies in cultural and emotional geography (Kaplan & Chako, 2015; Gilmartin & Migge, 2015; Main, 2013; Richter, 2011). These two different but complementary sets of feelings and emplaced experiences coexist in migrants´ minds and hearts, creating a new cultural imprint and hybrid identity (Kaplan & Chako, 2015; Main & Sandoval, 2014).

Notwithstanding the mentioned limitations of my study for revealing the role of place attachment in climate-change framings, this body of literature finds resonances in the data I collected. In fact, throughout the research, interviewees regularly referred to both the country of origin (Italy and China) and the current host country (Germany). While their worldviews strongly reflected their cultural heritage, some of their observations and visions of the future were informed by the local context.

Nevertheless, the concept of hybrid identities and of multiple cultural influences in the sense of place among migrants is not shared by all scholars. As Lewicka (2011) exhaustively reviews, a number of studies actually challenge the idea that migrants (or "newcomers") are able to develop affective bonds to a place that it is not the one of origin. It seems that discussion of the existence, the quality, the strength, reasons and time length of migrant´s place attachment is still vibrant and unresolved.

A second question regarding place attachment has also received increasing attention: its relevance in shaping individual´s climate change perception. This question is of great interest, considering that it emphasizes and legitimates the subjective and emotional meanings of climate change and that it allows to implement locally appropriate climate change policies (Fresque-Baxter & Armitage, 2012; Adger et al., 2011). Most authors agree that place attachment at the individual and shared level can shape climate change perception and can be decisive for individual and collective engagement (Manzo & Perkins, 2006; Carrus, 2014). Accepting this assumption is correct, two further conclusions can be drawn from the current body of literature:

1) The relationship between place attachment and climate change is bidirectional. On one side, place attachment can affect climate-change perception and judgments on local adaptation and mitigation measures by favouring those measures that bear a positive impact on the local (social and ecological) welfare (Moser, 2012). On the other side, climate change might disrupt place meanings and place attachments by interrupting the physical continuity of the place and its related cultural routines (Durkalec et al., 2015; Adger et al., 2013).
2) The relationship between place attachment and climate change cannot be seen with a deterministic approach. After the initial discipline-wide support of the NIMBYism (Not In My BackYard) phenomena, research has conceptually and empirically advanced the discussion by offering a more complex understanding of the relationship between place attachment and social acceptance of climate-related innovations (Batel & Devine-Wright, 2015). In fact, being attached to a place may lead people to both place-protective behaviour and/or support for local mitigation and adaptation measures. Individual responses depend on the social, historical and institutional context and on the local appropriateness of measures to be implemented (Manzo & Devine-Wright, 2014, Döring & Ratter, 2015).

In light of these two strands of research addressing place attachment, migrants, and climate change, a number of questions emerged. The following list of open questions is a first attempt to merge these two traditions, in the hope of offering a neglected but complementary perspective on place attachment, and, more broadly, of offering insights on the cultural, emotional and emplaced components of climate-change framings.

How (if so) does a migrant´s new cultural imprint shape the individual´s cultural climate framing? In other words: Do migrants develop place attachment to the hosting country and if so, how does it affect emplaced climate-change framings? Which kind of emotional and behavioural reactions might result from climate threats to the hosting country in comparison with the country of origin? What kinds of expectations are projected onto the hosting country in terms of adaptation and mitigation strategies? How is support (or lack of) for local mitigation and adaptation strategies informed by

other aspects of place identity such as community identity, integration struggle, sense of inclusion, fears of exclusion, perceived political and ecological inequalities, and so on? (Anguelowsky, 2013; Main, 2013). Are visions of the future of place under climate-change conditions shared across cultures? And finally: how might actively engaging migrants in climate change strategies foster and shape the process of place attachment and identity?

As emerged in this concluding section, including migrants as subjects of research will enrich the current discussion revolving around climate change and place attachment. Obviously, the list of unsolved questions is long, and probably other scholars might expand it further. Nevertheless, I argue that each one of these open questions is of great relevance as it holds the potential to disclose different emotional aspects belonging to the perceptual dimension and too often overlooked.

In this chapter, I brought to light the hybridity of climate change meanings held by migrants, based on memories of the home country intermingled with experiences in the hosting country (in this case Germany and more specifically Hamburg). In the next part of my work, I take a different approach to reveal the role that culture plays in shaping individual climate change meanings. In fact, I will investigate how (if so) people living in different cultural contexts perceive climate change differently. To do so, I will analyse the results of T+TST carried out with students from Germany and Taiwan. This approach will further enrich the discussion on culture and environment, and more specifically climate change, which is the core of my work.

Chapter 4

Dimensions of climate change

In the previous chapter, I showed how the complex issue of climate-change perception can be disentangled through its different components such as causes and consequences and responsibilities, thereby revealing the role of culture. But the same issue can also be approached by considering the different dimensions in which climate change take place: time, space and socially. So, where and when is climate change perceived to occur and who is perceived to be affected by it? In this chapter I draw on Construal Level Theory (Trope et al., 2007) to reveal psychological distances of climate change and their implications. By doing so, I provide an empirical response to the second research question guiding the present work, which is: How is climate change perception informed by geographical, temporal and social distance?

4.1 Construal Level Theory and Climate Change

In this part of my work I draw on CLT to systematically and thoroughly explore the mental representations and psychological distances of climate change. CLT has been developed by Trope et al. (2007) in the context of social psychology. It has been described as "a generic, multiply applicable framework" with theoretical implications and applications in judgment, decision-making and consumer science (Fiedler, 2007: 105). While some theoretical ambiguities are still being discussed, CLT is considered one of the most compelling and integrative theoretical approaches of the recent years (Giacomantonio et al., 2010). Milfont (2010) was among the first to highlight the relevance of CLT for exploring individual perceptions of climate change and to identify its implication for the development of targeted communication strategies. Swim et al. (2011) identified in CLT an explanation for the mechanism of discounting, often mentioned as one of the reasons behind the lack of engagement of the public with the topic of climate change. Discounting suggests that underestimate the magnitude of climate change-related effects, as they are perceived to be far in time and space.

In addition to these conceptual contributions on the potential of CLT in the context of climate change, a number of recent empirical studies based on quantitative data explored climate-change perception and psychological distance (Spence et al., 2012). While CLT encompasses both psychological distances and construal levels, the latter have not been explored yet in the context of climate change (McDonald et al., 2015). With the present study I attempt to add to the existing stream of research on CLT and psychological distance by analysing both psychological distances and construals, and by employing a qualitative angle. The study is based on cross-cultural data, as it empirically applies CLT to a group of Taiwanese and German students. In so doing, this study contributes to the inquiry of the effects of culture on developing and employing different mental representations of climate change. Through a systematic analysis of psychological distances and construal levels of climate change and their implications, I aim at identifying how people construe, make sense of and elaborate on climate change. In particular, I analyse the role of geographical, temporal and social dimensions in mental representations of climate change.

I first introduce CLT and its potential contribution to the understanding of climate-change mental representations. I then continue with a focus on the characteristics of the participants of this study and on the analytical process. Following that, I present some of the results, focusing on the geographical, temporal and social dimension of psychological distances. In order to provide a comprehensive analysis, the three dimensions are analysed separately before their commonalities and interactions are discussed. I also study construals framing the perceived quality and quantity of climate-change communication and on feelings and prototypes that permeate statements on climate change. In the outlook, I summarize the main findings and reflect on the usefulness of CLT as an approach for investigating climate-change perception from a social and cultural point of view. Finally, in the concluding section, I reflect upon the relevance of both proximities and distances for climate change, provide an overview of existing literature on cultural constructs of psychological distance, and explain how the literature resonates with my work presented in this chapter.

4.2 Theoretical psychological distance: geographical, temporal and social dimensions of climate change

As discussed at the beginning of this dissertation, climate change has a convoluted character, which makes it hardly perceivable by the human senses. Nevertheless, the media and scientists constantly report that climate change is happening and that people should mitigate it and adapt to its consequences (Schmidt et al., 2013). CLT elucidates how people can make sense of something abstract and intangible, suggesting that an object (in this case, climate change) can be mentally represented as low level or as high level construals. Low level construals are mental representations of an object that are concrete, rich in detail, contextualized and provide answers to the "how" question. High level construals, on the contrary, are mental representations of an object focusing on central features; they are abstract, decontextualized and offer answers to the "why" question. In other words, the same activity can be described in abstract terms (e.g. make a call to a friend) or in concrete terms (e.g. dial Martin´s number), high and low level construals respectively.

Both the process of abstraction (from low to high level construal) and the process of specification (from high to low level construals) have their advantages and disadvantages, each with different implications. In particular, abstraction generates information about the core meaning of the represented object and its relation with other categories of representation. Employing high level construals bring to light invariant aspects of an object; the object´s core meaning does not change when looked at from different distances and contexts. By contrast, shifting to low level construals allows detection and characterisation of details of that object (Giacomantonio et al., 2010). Representing an object at low level makes it more imaginable, concrete, perhaps tangible, easier to remember and embody (Shapira et al., 2012).

Out of this taxonomy it follows that when the object of interest is not in the "here and now", it cannot be directly experienced. Thus the individual perceives it as psychologically distant. In order to describe it, the individual will employ the object´s general and decontextualized features, forming a high construal level. An object that is located in the "here and now", in contrast, will be represented at low construal levels, indicating psychological proximity.

Psychological distance is defined as “a subjective experience that something is close or far away from the self, here and now” (Trope & Liberman, 2010: 440). As postulated in CLT, construal levels are cognitively and functionally correlated with psychological distance. The greater the psychological distance, the higher level and more abstract the construal will be. On the other hand, an object perceived to be close tends to be represented through a more concrete, low level construal. According to Trope and Liberman (2010) people would tend to use high construal levels to represent objects that are psychologically distant. Vice versa, the construal level used affects the perceived distance to the object: abstract, high level construals produce an individual sense of distance from the represented object. Consequently, psychological distance and construal levels are strongly linked: one affects and is affected by the other. The reciprocal effects of distance and construal bear important implications for the mental representation of climate change. Following CLT´s core assumption, describing climate change abstractly (high construal level) would lead individuals to perceive climate change as distant. As a corollary, if climate change is perceived to be psychologically distant it will be construed at higher level (Figure 8).

Psychological distance has four analytical dimensions: geographical, temporal, social and hypothetical. For the purpose of this study and owing to the method chosen, I focus on the geographical, temporal and social dimension of climate change. The fourth dimension, hypotheticality (which refers to the possibility that an event actually happens), was not examined. In fact, asking students about climate change implicitly entails its existence and thus excludes hypotheticality. In the following section, I turn to empirical analysis of the three dimensions of psychological distance in reference to climate change.

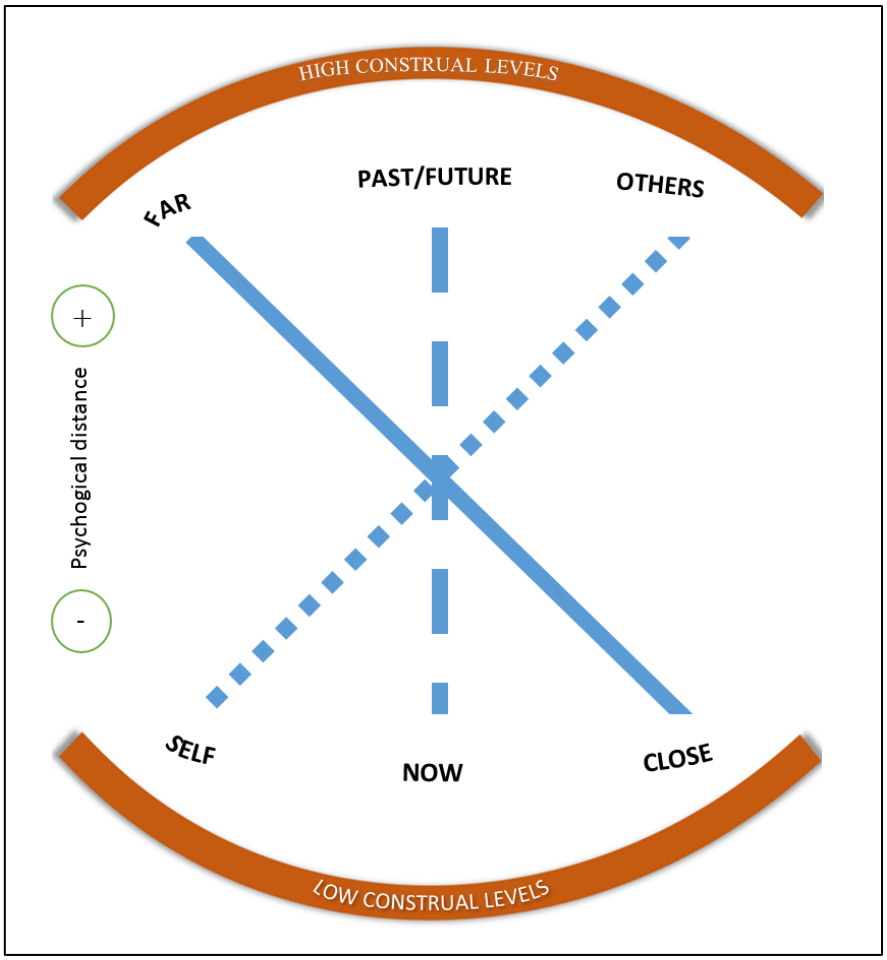

Figure 8: Construal Levels and psychological distances*. This figure schematically reproduces Construal Level Theory and the postulated correlation between psychological distances and construal levels. _____ = geographical distance _ _ _ _ _= temporal distance ……= social distance.*

4.2.1 Geographical distance

Geographical distance refers to the spatiality (spatial dimension) of a mentally represented object. In the case of climate change, this dimension indicates *where* climate change is perceived to take place: in distant or close locations. Related questions may be: Is climate change perceived to happen at a global or at a local level? Is it affecting developing countries or is it affecting the individual´s living environment?

The dichotomy between global and local in the framing of climate change, and the implications thereof, has been widely discussed in the literature. Several studies (Lorenzoni et al., 2006; Leiserowitz, 2006) found that participants relate to climate change as a geographically distant threat. One of the reasons behind these processes of

distancing has been identified in the lack of representations of climate change as a local concern. Following the same line of argument, Scannel and Gifford (2011) suggest that employing personally relevant messages would reduce such distance. In particular, the message should focus on local impacts and on local mitigation or adaptation initiatives. However, Uzzel (2000) demonstrated with his review of three case studies that the assumption that global issues are not relevant for people is invalid. In his study, participants had cognizance of global environmental problems, which were considered even more severe than the local ones. Devine-Wright (2013), in turn, recently contributed to this line of inquiry with his call for academic research that recognizes the relevance of place attachment at both local and global levels. Perceiving climate change as a global issue is conceived to be an example of geographical distance, but there might be space for a new understanding. Messages that illustrate global effects of climate change might emotionally appeal to an attachment informed by a feeling of global identity, finally leading to individual engagement.

4.2.2 Temporal distance

The second dimension of psychological distance refers to the time-scale of the object mentally represented, and it is called temporal dimension. In the case of climate change, this dimension indicates *when* climate change is perceived to take place: in the past, in the present or in the future; in other words, when will the effects of the problem be felt? Is it a past, contemporary or a future problem?

Time and perception of time play a crucial role in the mental representation of climate change. Individuals tend to focus on short-term consequences, but the temporal characteristics of climate change clash with it (Brace & Geoghenan, 2010). Climate change is the consequence of carbon emissions of the past decades, the effects of which will be visible primarily in the upcoming years and centuries. This functional time lag between causes and effects of climate change is an obstacle to the perception of climate change as a current threat (Milfont, 2010). In addition, media and scientific reports often refer to 2050 as a turning point. Such timeframe exceeds the timespan usually comprehensible to people (about 15 years), who might then conceive 2050 as too distant to matter (Pahl, 2014). In order to overcome the problem of temporal distance, research often suggests focusing on communication strategies that include the

contemporary visualization of climate-change futures and narrative approaches (Pahl, 2014).

4.2.3 Social distance

Social distance refers to the extent to which an individual perceives him- or herself as affected by an object or an event. In the case of climate change, it indicates *who* is perceived to be affected by climate change. Do individuals think that climate change has an impact for them or on their lives, their community or other socially and geographically distant people?

A number of studies point to the role of experience in climate-change perception (Spence et al., 2011; Egan & Mullin, 2012). In the case of a climate-change event, the perceived social distance is reduced to the minimum: the individual becomes able to directly experience the impact of climate change on his/her life and on the community. Nevertheless, social closeness to climate change is still an exception; surveys indicate that most people do not perceive themselves as climate-change victims (Myers et al., 2012; Ratter et al., 2012), and it has, furthermore, been demonstrated that perceiving climate change as a socially distant phenomenon hinders preparedness to act against climate change in terms of adaptation and mitigation (Spence et al., 2012).

While the three dimensions have been herein presented as separate, the social, temporal and geographical dimensions should be understood as distinct but related aspects informing an overarching distance. All three refer to the lack of direct experience. The three dimensions are interconnected and correlate with high and low construals (Giacomoantonio et al., 2010). In the next section, I illustrate the method used to collect and analyse data on construal levels, psychological distances and their correlation with climate-change mental representations among students in Germany and in Taiwan.

4.3 Analysing psychological distance

As mentioned above, CLT has been applied to the topic of climate change only recently. This is also reflected in the limited variety of methods used by scholars to empirically explore people´s psychological distance to climate change, namely: interviews (Spence et al., 2012), survey (Scannel and Gifford, 2011; Haden et al., 2012), and weather data

coupled with survey (Hamilton & Stampone, 2013). In my work, I attempt to widen this short list and I employ 10 plus 10 Statements test. Following, I will explore the advantages of this method and the analytical framework I employed.

4.3.1. Method and data collection

As previously shown, climate change is a scientific and cultural construct. Consequently, I argue that for investigating how individuals make sense of it, any pre-definition of climate change should be avoided. As illustrated in Chapter 2, a number of methodological and conceptual challenges that characterized my work found solution in the 10 plus 10 Statements Test, which allows the participants to freely express their climate-change framings, while still providing the basis for a scientific and systematic analysis. Furthermore, its rather simple design maximizes its cultural appropriateness. In particular reference with CLT, T+TST has a number of advantages; it allows: a) the investigation psychological distance, b) the study of construals and their correlation with psychological distance, and 3) the revelation of which of the three dimensions of psychological distance is most relevant to an individual interviewee.

The test was administered by two University professors to their respective students at the University of Hamburg (Germany) and National Taiwan Normal University (Taipei, Taiwan). Each student received a sheet of paper, with the following instruction: “Please write 10 statements and/ or words referring to the topic ‘climate change’. Please note that there is no ‘right’ or ‘wrong’ answer. The test is anonymous” (see Appendix A for samples in different languages). The test was delivered to 46 students at the University of Hamburg (Germany) in January 2014 and to 46 students at the National Taiwan Normal University in Taipei (Taiwan) in September 2014. Students were given 12-15 minutes to complete the task. The two student groups consisted of Geography students in their second year of Bachelor’s studies. Most likely, they had previously been confronted with the issues and phenomena surrounding climate change.

Students and young adults, more generally, have been the object of a number of recent studies in the context of climate change (Chhokar et al., 2010; Corner et al., 2015). The young adults of today are seen as the generation affected by climate change in many scientific studies. They are “the most vulnerable to the legacy of decisions made by older

generations" and "their voices are not prominent in the political, media or cultural discourse on climate change" (Corner et al., 2015: 523). Also, as highlighted by Worsley and Skrzypiec (1998), young people are important change agents as they disseminate environmental behaviours within everyday family contexts and practices. Nevertheless, the choice of engaging students in this test holds an important limitation because they represent a very specific targeted group, with younger age and higher education than the population average.

4.3.2 Data analysis

After translating the tests into English, the content was coded. Drawing on CLT, in the first step, three categories were established: geographical, temporal and social distance. In this phase, statements that included references to the spatial, temporal and social dimension of climate change were coded in the corresponding category and subsequently analysed.

Following this initial step, the analysis focused on those remaining statements where no direct reference to the three dimensions was found. Recurrent topics were identified: among them, communication of climate change: perceived quality and quantity and prototypes and emotions were selected as relevant categories of mental representations. I analysed both categories by drawing on CLT in the light of their implicit construal levels (high or low). Finally, I explored the convergences and divergences of the categories found among the two groups and their implications (Figure 9).

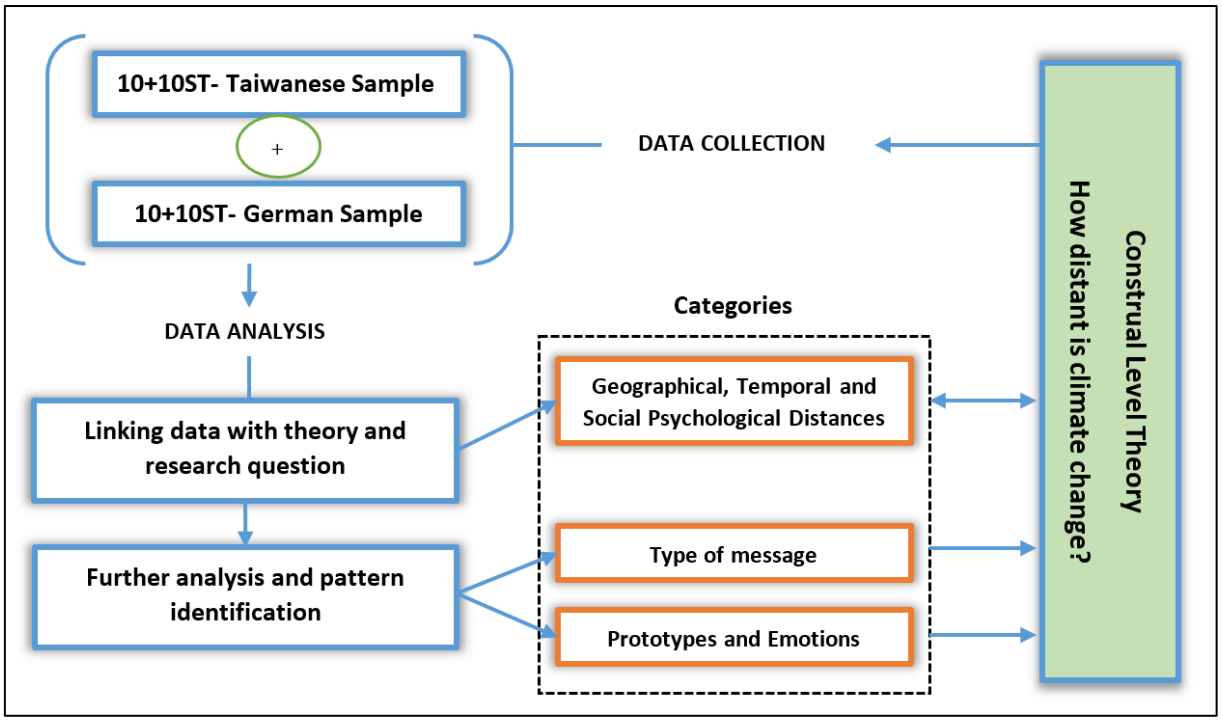

Figure 9: Analytical framework informed by Construal Level Theory*. This graph represents the different steps from theory to results´ analysis. The framework was designed to investigate psychological distance and construal levels informing students´ statements on climate change (readapted from Gläser & Laudel, 2013).*

4.4. Empirical psychological distance among students

In both the German and the Taiwanese sample, 41% of the respondents (nDE= 19; nTW=19), referred to the perceived geographical, temporal or social dimension of climate change in their statements. In both samples, the geographic element was predominant. Specifically, in the German sample, 13 statements were related to the geographical dimension, 6 to the temporal, and 5 to the social. The Taiwanese tests included 13 geographical statements, 7 temporal, and 5 social. In the following paragraphs, I explore these three dimensions, highlighting differences and commonalities among the two groups and reflecting on their implications.

Geographical distance

In the climate-change statements of the students of the German University, the geographic dilemma "where is climate change located?" is approached in multiple ways. Often, participants (n=6) implicitly disclose in their statements that climate change is

happening in places such as: “drowning Netherlands” (DE_10), “underwater Bangladesh” (DE_18) and in “disappearing paradise islands” (DE_6).

Interestingly, statements expressing a juxtaposition of the home country and other states or geographical areas are recurrent, too: “Threat for Germany: medium-high, for other states: high” (DE_32); “Main consequences not in Germany” (DE_36). Such statements reveal a significant perceived distance from climate change – a climate change that is not felt to be dangerous at “home” and whose worst effects are somewhere else, beyond the immediate German world. While the perceived geographical distance to climate change is undeniable, it is worthwhile to look to these data from another perspective. In fact, open questions such as “Will there still be Hamburg?” (DE_13) indicate an ongoing process of reflection on the issue of climate change and on its geographical dimensions, a process that is in itself a shift from a high level construal of climate change to a lower level. The individual does not simply absorb the information of climate change as but s/he reflects on its concrete meaning in his/her context and discerns its distinct parts. The above open question implies the possibility of a closer climate change, so close that it might even affect the participant´s own city.

The analysis of the tests of the Taiwanese students also shows a predominant trend toward locating climate change in distant geographic areas. In particular, only 1 of the 13 participants who mentioned the geographical dimension of climate change referred to Taiwan. The majority of geographically related statements used Tuvalu, California and North and South Poles as paradigmatic examples. The statements did not include any further details about the representative entity chosen or the severity of climate change impacts in these areas.

In contrast with the German´s group sample, the Taiwanese students did not articulate any cross-national comparisons nor any open-ended question. Due to the methodological limitations, it would be too speculative to further elaborate on this aspect.

Temporal distance

The temporal characteristics of climate change have been identified as psychological barriers to the perception of climate change (Pahl et al., 2014). The results of this study confirm the presence of a temporal distance in both the German and the Taiwanese groups. In the German group, statements such as “In the next 100 years, humans will be extinguished” (DE_35) and “Decrease of my life quality in the future” (DE_46) are common. By contrast, Taiwanese students make such statements as “there was no Typhoon in August” (TW_2; TW_10), “Ancient Egypt Civilisation moved” (TW_23). The dissimilarity between the two can be articulated: while the German group located climate change in the future, the Taiwanese focused their climate change statements in the past. A closer look shows that the statements of the students of Hamburg University were often non-specific in terms of time and, in many cases, related to the effect of climate change on the one’s own future-life; the Taiwanese students’ statements were much more specific referring to the year (2012) and, in some cases, to the month (August).

These different means of sequencing and relating to time illustrate the importance of individual mental representations and cultural understanding of climate-change temporalities. A scientific study, as well as a communication strategy or a policy proposal, that ignores these factors and focuses on the wrong temporal dimension will have little social resonance, and, as a consequence, it is probably bound to fail. It simply lacks the culturally grounded temporalities of climate change.

Social distance

Analysing the statements, I found that the social dimension was the least mentioned among the three dimensions of psychological distance: 13% (nDE=6) of the German students and 17% (nTW=8) of the Taiwanese students referred to it at least once. Yet, the results still afford the possibility of delving into the differences between the two groups and of understanding how the three dimensions of psychological distance are linked.

Here are some paradigmatic examples of how Taiwanese students approached the problem of social distance: “All people face greater challenges” (TW_43); “Challenges to human” (TW_46). In contrast to this, German students reflected on climate change in relation to themselves or their social environment: “To what extent am I affected?” (DE_10); “Threat not for us” (DE_21); “Decrease of my life quality in the future” (DE_46).

The differences among the two groups of students encountered in the analysis of geographical and temporal distance are hereby observed and confirmed. As with geographical distance, so with social distance: a process of reflection can be found in the German sample which is absent from the Taiwanese tests. Open questions (DE_10) and clear statements (DE_21; DE_46) suggest such ongoing reflection process. As observable in the citations above, German students tended to ponder the effect of climate change on their own, as individuals. The use of personal and possessive pronouns (I, us, my) is emblematic of this process. In fact, it suggests embodiment to some extent, which is a feature of low construal level. The response patterns of participants from Taiwan differed significantly from those of the Germans. Generic abstract statements about the effect of climate change on “people” and “humans”, congruent with a high construal level, took the place of statements about the effect of climate change on the self. Relatedly, the interviewees references to the social distance of climate change, once more bring to light the different Eastern and Western worldviews, and, in particular, the collectivist versus individualistic features. For the former, the collective dimension is put forward rather than the individual one, while in the latter, the “I” and the individual dimension is prioritized.

The second recurrent aspect is the reported perceived link between the social and temporal dimensions and, as seen previously, the difference in the temporalities of climate change employed by the two groups. The tendency of German students to connect the social dimension to the future (“future generation” (DE_46); “generation Y” (DE_39)) is absent in the Taiwanese sample, where all statements refer to the present. It is thus clear that exploring the social dimension of psychological distance is crucial for understanding mental representations of and potential for climate change engagement. Who is affected by climate change? Who should adapt and mitigate to it? Awareness

about these aspects is imperative to develop socially adequate and culturally embedded mitigation and adaptation strategies.

Informed by CLT, the three psychological dimensions mentioned in the tests were analysed. The analysis disclosed information on where and when climate change is perceived to take place and who is perceived to be affected by it. In the following section, I discuss the results of the second analysis I carried out, that of statements which did not explicitly mention any of the three dimensions of psychological distance. In this phase, two categories were found: "communication of climate change: perceived quality and quantity" and "emotions and prototypes". Both reveal interesting patterns in mental representations of climate change and offer insight into construal levels of climate change.

4.5 Communication of climate change: perceived quality and quantity

Among the German group, the topic of climate change seems to be rather fuzzy. In fact, almost half of the German participants expressed some level of uncertainty. While existence of climate change itself is not questioned, doubts exist about the credibility of the messages received. This uncertainty often emerges in the 46 tests, phrased, for example, as "it is not known which prediction to trust or which will be the consequences" (DE_3).

When German students gave statements (n=17) about the source of information, they mainly referred to media, and this with a critical eye. Claims such as "Media exaggerate" (DE_7) and "Doubts regarding media reports" (DE_34) are recurring entries. Considering that participants were university students, it is important to note the lack of statements referring to science: climate change appears solely as a scientific research opportunity for the future, and academic work is not explicitly listed as source of information.

Notwithstanding the leading presence of media, the message is perceived in a scattered and discordant way, as reflected in these statements: "1,000,000 experts" (DE_36); "many different predictions" (DE_ 2); "different opinions" (DE_28).

It is striking to note that while some students report an excessive amount of information and of sources of information, others state that "we are not concretely informed" (DE_5) or that they are "too little informed" (DE_14).

In the first statement the participant draws attention to the quality of information. It stands as a call for a "closer climate change" which can be supported only by concrete and personally relevant information. In the second, another participant manifests his/her disappointment about the insufficient quantity of information. The apparent discrepancy between the surplus and the lack of information lead to important considerations. The receiver seems overwhelmed and almost anaesthetized by the number of different messages coming from different sources, to the point that none of them is conceived as relevant or trustworthy. Paradoxically, the receiver therefore considers him/herself uninformed. Feeling uninformed about a topic suspends the process of making sense of it; it means remaining on a high level construal where there are no details and where the topic is neither geographically nor socially contextualized. It can be argued that the perceived characteristics of the message – scattered, discordant and abstract – constrains the receiver to stay at a non-concrete level, even widening the psychological distance between the topic and its audience. Interestingly, the Taiwanese students did not elicit any comment or reflection on the quality and the quantity of the received climate-change communication. Such results underscore the need to communicate climate change in a more relevant and concrete way for the audience, in direct contrast to the flood of technical and scientific information that the non-scientific public is too often subjected to.

4.6 Feeling and anchoring climate change: Emotions and Prototypes

Statements of the two groups differed in a third, salient respect: the clear predominance of prototypes in the Taiwanese statements in contrast with the appearance of personal feelings-related statements in the German group. Prototypes are hereby defined as objects, or images that are used to represent a category, in this case climate change. In the Taiwanese group, more than three out of every four participants (78.2%; nTW=36) gave at least one statement which represented a prototype or generic concept. Global warming, greenhouse effect and ozone layer depletion were the most often elicited. To a lesser extent than the Taiwanese students, German students also included prototypes

(26%, nDE=12). Also in the German case, the term “global warming” was recurrently linked with the emblematic species of “polar bears” (completely absent among Taiwanese students). In both samples, prototypes were cited solo, without any explicit context or further explanation – as if they were self-explanatory or synonyms of climate change. Prototypes are the result of a categorization process, which is in turn characteristic of high level construal. The individual employs a subordinate object to represent another object (in this case, climate change) leading to simplification and abstraction. Thus, global warming, polar bears, greenhouse effect and ozone layer depletion are mentally represented as belonging to the same category of climate change. While this similitude is inaccurate from a scientific point of view, participants employ these objects and concepts in order to understand and represent climate change in an abstract, though meaningful and experienced way. It is crucial to note how the choice of those objects and concepts reveal and, at the same time, induce psychological distance. In fact, the different kinds of prototypes used refer to different cognitive models are permeated by different cognitive distances (Mervis & Rosch, 1981).

As suggested by Rudiak-Gould (2013) climate change, global warming and the greenhouse effect are popular terms which enforce invisibility and consequently enhance psychological distance. The greenhouse effect is a metaphor which is “both global and microscopic” (Rudiak-Gould, 2013). The term global warming also focuses on the global dimension, by definition not observable at the local level. As shown in recent studies, the terms climate change and global warming are increasingly used by media and by the public interchangeably, but their impact on public understanding is different (Whitmarsch, 2009). Climate change is more neutral, with a scientific connotation and more abstract, while global warming evokes embodied experiences, concerns and emotions. Yet, studies on the effects of using one or the other in communication strategies yield dissonant results (Dunlap & Brulle, 2015).

From 1994 (Bostrom) to the most recent research (Philo & Happer, 2013), a large amount of literature has shown that the public conflates ozone layer depletion and climate change. According to Ungar (2000), the conflation of the two topics is an example of syncretism, consisting of assimilating new with pre-existing information. In line with these findings, the present study shows that even the younger generations of students associate climate change with the ozone layer.

As explained above, the process of conceptualisation leading to prototypes is a process of abstraction where the object's (climate change) characteristics are observed, and, according to them, it is categorized. During this process, the individual carrying on the mental representation relegates his/her individuality to the background. This condition changes once the individual starts to reflect on how the object to be represented might exert an impact on his/her own world and on his/her person. Such a reflection shortens the psychological distance between the subject and the object, ultimately leading to an expression of emotion.

This process and the consequent individual dimension was completely absent in the Taiwanese sample, but it emerged in 17.3% (nDE=8) of German participant statements. The following remark from a T+TST of a German student offers a picture of how climate change can become an emotional issue: "Feelings like fear, concern, pity for the victims, fury and irritation" (DE_4).This statement encompasses different levels of emotional reactions to aspects of climate change. Fear and concern seem to refer to climate change consequences, pity is explicitly connected to climate change victims, and finally, fury and irritation might be associated with the causes of climate change and the way they have been managed. Also as highlighted by this student, fear is the most recurrent feeling that emerges in the German group´s statements. Admittedly, the numbers of this type of statements are still small and the emotional component is still secondary to other aspects such as psychological distance or discordant communication. Nevertheless, the mere fact that students gave space to feelings is significant and symptomatic of a climate change that is neither abstract and nor distant; to the contrary, it provokes emotions. This relates to the current empirical results of this research and recent literature (Ramkissoon & Smith, 2014) in which an effective climate change communication strategy should include emotions. This is a sufficiently significant result that the role of the emotional dimension of climate-change perception and in climate change engagement requires further exploration.

4.7 Outlook

In recent years CLT contributed to understanding a number of cognitive mechanisms, and it succeeded in integrating different concepts. In this chapter, additional progress

has been made by providing empirical results on both psychological distances and construal levels. Through an in-depth analysis, it has been possible to illustrate how individuals make sense of climate change, using geographical, temporal and social dimensions. To date, these crucial aspects have not been thoroughly investigated in the climate change-related literature, which mainly focuses on quantitative approaches and on one or another psychological dimension. The present results show that climate change is "distant" – not or not only in a Euclidian manner, but in the three dimensions of psychological distance. Analytical categories (first, psychological distances, and then construal levels) supported a systematic analysis of students´ statements which revealed that both distances and construals are culturally embedded and at work in climate-change framings.

In relation to construal levels, the data highlight relevant differences among the two groups. High construal levels of climate change appeared mainly in the Taiwanese sample; this group often used abstract definitions and prototypes to express their mental representations of climate change. The statements given by German students, on the other hand, revealed an open reflection on climate change; mental processes of specification alternate with processes of abstraction to make sense of climate change.

This difference must be understood in its cultural context. Shapira et al. (2012) draw attention to how individuals belonging to different cultures might possess different predispositions towards certain construals. In particular, interdependent cultures (Asiatic and South-American) typically interpret objects in their context and in relation with other objects, which would be congruent with high construal level mental representations. On the other hand, independent or individualistic cultures (North-European and North-American) define an object in isolation from its context and prefer to focus on its characteristics, which correspond to low construal levels. My data provide empirical support for these assumptions and suggest that culture plays a crucial role in mental representations of climate change. In Section 4.8.1, I delve into a more detailed cultural interpretation of my data based on the scientific literature on the cultural constructs of psychological distance.

The analysis of the statements elicited by German and by Taiwanese students also illustrates that climate change construals are permeated by psychological distance. Geographical distance in particular was important for describing climate change, but the

temporal and social dimensions were also present. These results are in line with previous research that found that climate change is perceived as taking place somewhere else, in the future, and that it is affecting/it will affect other people. But the results also illustrate a different trend: an attempt to make climate change less distant. Indications of this trend are the open questions and comparisons of climate-change impacts in the individual´s own country with other areas as found in the German students´ statements.

In sum, the study highlighted important aspects concerning how individuals make sense of climate change, going beyond scientific definitions of it. The CLT approach and, in particular, the analysis of construals and of psychological distances at the individual level offer a great opportunity to systematically study individual understandings of climate change. Climate change was framed through both low and high construal levels which were permeated by spatial, temporal and social dimension in people´s minds. Yet, such position is dynamic and further studies are needed to understand how and why people might change their representations of climate change in different contexts and different times.

4.8 Beyond the empirics: reflections on psychological distances, proximities and culture.

In this concluding section, I discuss the origins of certain deterministic accounts of psychological distance, and then I conclude with some reflection on how existing body of literature on cultural understandings of distances resonate with my empirical results.

4.8.1 Psychological distances and proximities

As previously indicated, psychological distances and CLT have informed an increasing number of climate-change perception studies in the recent years (Spence et al., 2012; Milfont, 2010; Carmi & Kimhi, 2015). The majority of these studies have been characterized by the underlying assumption that proximity (and therefore low construal levels) should be preferred to distance (high construal levels). This assumption is attributable in part to a) the influence of literature on the role of experiences in climate-change perception and b) the perpetuation of a misinterpretation of CLT.

First, the fact that psychological distance and proximity are understood as respectively negative and positive can be traced back to the influence of research on the role of experience in perception of climate change. As Reser et al. (2014) state, “In the context of a personal encounter, uncertainties with respect to if, what, when, and where, are reduced, and the face of climate change becomes more known, the threat and issue more personal” (Reser et al., 2014: 531).

Research on the effects of direct experience in the perception of climate change has mainly focused on floods and extreme weather events (van der Linden, 2015), and it is distributed worldwide. A number of scholars have investigated climate-change experiences of individuals from Norway (Lujala et al., 2014), China (Wu et al., 2015), the United States (Myers et al., 2012; Akerlof et al., 2012) and the United Kingdom (Spence et al., 2011; van der Linden, 2015). The body of literature exhibits a rather homogeneous result: people who have directly experienced climate–related events show more concern and willingness to act to tackle climate change. In these studies, it is more or less explicitly stated that experience is equivalent to psychological proximity, which in turn is equivalent to engagement. It follows that psychological proximity is considered more meaningful and positive. As a consequence, it is important to note that while the correlation of experience with concern has been widely demonstrated, the correlation between experience and actual behaviour remains under-explored (McDonald et al., 2015).

The second reason can be easily traced to the initial aim of CLT (Trope et al., 2007: Trope & Liberman, 2010), which was to explain how people make sense of abstract objects through psychological distances and construal levels. The authors of CLT did not interpret distance as inherently negative and proximity positive. Instead, they analysed a number of variables such as the impact of values (altruism versus achievement), the issue´s relevance (central versus peripheral), feasibility versus desirability and sunk-cost bias (tendency to continue to commit resource in a failing activity) in contexts such as risk-perception, negotiation and consumer behaviour (Trope et al., 2007; Trope & Libermann, 2010). After the initial publication of CLT, Trope and Libermann (2014) dedicated a paper to the specific exploration psychological distance and high construal levels with the aim of releasing them from their negative connotation. To do so, they elucidated that the process of abstraction does not consist in impoverishment of

meaning, but it rather implies acquisition of meaning in terms of correlations with other constructs. This approach enriches the discussion and the understanding of CLT, legitimating both low construal levels and psychological proximity and high construal levels and distance. Nevertheless, once applied to the topic of climate change, this comprehensive approach to CLT was lost in favour of a rather limited understanding of the theory and of its implications, one that saw psychological distance as inherently negative and proximity as positive.

As a consequence of these two processes that characterised the entrance of CLT in the field of climate-change perception studies (namely, literature on experience and misunderstanding of CLT´s aims), a number of studies suggest the employment of communication strategies that focus on the local dimension of climate change to trigger people´s concern and concomitant behaviour (Scannel & Gifford, 2011; Taylor et al., 2014; Evans et al., 2014; Howansky, 2015). Nevertheless, this assumption has recently come under scrutiny both theoretically (Brügger et al., 2016) and empirically (Spence et al., 2012). The criticism has resulted in a call for analysis and recognition of the complexity of the proximising approach in communication strategies. In fact, depending on individual characteristics and on individual place attachments, proximising might lead to undesired outcomes, such as triggering defensive strategies, denial and feelings of guilt (Brügger et al., 2015).

In sum, the scientific literature is showing an increasing criticism of the deterministic approach to proximity as bearing positive impacts on climate-change concern and engagement in people. In line with this, there are two reflections that can be made: the first is that a focus on perceived-distant climate change appears to be relevant (and from a CLT perspective of high level construals) and its potential positive impacts are often not explicitly taken into account. Only recently have some authors done so by considering both distances and proximities as valuable analytical elements to investigate climate-change framings. More specifically, Devine-Wright (2015) argues for the importance of interplay between the national and global dimension of climate change for individual engagement. For the framework of my research, it is interesting to highlight the role of worldviews and of cultures in forming global attachment(s). Before Devine-Wright (2015), Haden et al. (2012) also suggested that distant and proximal

framings can coexist and that they respectively correlate support and engagement with mitigation and adaptation strategies. In the same year, Beltrame et al.'s (2012) idea of climate change as master frame and source of rhetoric brought the discussion even further by arguing that climate change has created a new perception of the notion 'global' as something that does not clash with the experience of the 'local' but rather connects, incorporates and merges multiple social dimensions (Beltrame et al., 2012:25). Hopefully, these theoretical and empirical advances will lead to studies that investigate how people relate and feel attachment in terms of different spatial scales (local, national, continental and global) and move beyond the too frequent assumption that close is relevant and distant means lack of concern.

The second crucial reflection is on the predominant role that the geographical dimension of psychological distance plays by comparison with the other dimensions. It is indeed possible to note an absence of studies that consider the other dimensions – namely temporal and social, in a more flexible and less deterministic way. In the last decade, a number of scholars have dedicated efforts to investigate the importance of the local dimension in people´s framing of climate change. The time has come to widen the conceptual horizon and to take into account not only the global dimension, but also the question of future and past and of Others and self as integral dimensions of people´s climate-change framings. In the next section, I show, once more, how a cultural perspective can support such openness and initiate reflections on our assumptions about the implications of high and low construals and of proximity and distance in the three dimensions.

4.8.2 Cultures of psychological distance

Undoubtedly, CLT and the concept of psychological distance (Trope et al., 2007) have greatly enriched the understanding of the process of individual representations of events. Nevertheless, it is important to note that CLT´s basic assumption is not culturally neutral. On the contrary, it is informed by a notion of self, here and now, that deeply reflects the Western worldview. A growing number of scholars have explored this issue and revealed different cultural understandings of psychological distance and underlying mechanisms, such as perspective flexibility and perspective taking (Yan, 2014; Wu et al., 2013; Wong & Wyer, 2016). In particular, the egocentric perspective at the core of CLT

is based on the assumption that the self, the present and the here are the starting point from which people make sense of events. It follows that events that involve others, are geographically far, and take place in the future or past are considered by individuals as distant and abstract, prompting high construal levels (Wong & Wyer, 2016). Yet, individuals belonging to Eastern cultures represent events from a different starting point. The Chinese holistic worldview encourages transcending the egocentric perspective. In order to interpret events, Chinese spontaneously prioritize distanced perspectives and adopt the perspective of Others from other times (Kross & Grossmann, 2011). In sum, it can be argued that Eastern cultures employ an allocentric perspective while Western cultures adopt an egocentric perspective. Acknowledging and taking into account both perspectives might help to ensure a culturally sensitive approach to CLT and to the analysis of psychological distance in cross-cultural studies.

In what follows, I draw on the recent body of literature that analyses the cultural constructs of psychological distance with a focus on the temporal and social dimension. This review allows me to further reflect on my results and to look at them from a different perspective. I also offer a first contribution to the knowledge of cultural psychological distance in the context of climate change, which is, to the best of my knowledge, currently missing.

In my work, I observed that German and Taiwanese students employed different time orientations in their climate-change framings. Namely, the German group was more present- and future-focused, while the Taiwanese group was more past-oriented. Such findings are echoed by Gao (2016), who investigates cultural cognitive processes and their influence on time orientation and sequencing. In her review, she refers to North Americans and Chinese groups, which can be compared with the German and Taiwanese in my study, because the groups represent an independent versus interdependent, and analytical versus holistic culture, respectively. As also found in my research, Chinese people prioritize the temporal domain of the past and future dimension, and employ a long-term perspective. In so doing, they perceive so-called temporally distant events (in this case, climate change) as more concrete than North Americans/German. Simply put, what is considered far for Western cultures (past and future) is considered close and relevant for Eastern, and vice versa. This difference in the cultural structuring of time

should not be taken as an isolated or negligible factor. To the contrary, the individual predisposition to focus on the present or on the future and past is correlated with a number of cultural features and socially generated preferences. In the case of Chinese culture, time orientation informs and is informed by a low sense of self-agency, cyclical notion of time, predominance of causal chains, systems thinking and belief in the unpredictability of events (Briley, 2009; Guo, 2008).

With regard to the social dimension of psychological distance, Maddux and Yuki (2006) discuss the differences of self-responsibility and the related concept of the self among Western (independent, analytical) and Eastern (interdependent, holistic) cultures. As an example of an Eastern concept of the self, the authors report that self-responsibility "seemed to refer not only to taking into account the consequences of actions on oneself but also taking into account the consequences for any number of people who could be either directly or indirectly affected by one's actions" (Maddux & Yuki, 2006: 670). Similarly, Pan et al. (2013) argue that individuals belonging to the Chinese culture tend to give priority to collective interests rather than personal interests. This approach differs from Western culture that conceptualises individual and community as separate entities and the predominance of the self-interests and personal fulfilment (Oyserman et al., 2002). It follows that the extended-self of the Chinese generates a wider, more concrete and meaningful notion of Others than that of independent, individualised Western culture. This analysis reveals the cultural boundaries of social psychological distance of climate change. Furthermore, such a culturally based perspective extricates CLT from its Westernised nature based on typical concepts of the self, the here and the now. By doing so, it avoids an unreflective and deterministic approach to CLT, while at the same triggering a broader and culturally contextualized definition of distance and interconnected construals.

In conclusion, it seems clear that the role of culture should not be overlooked and cannot be overestimated. In fact, culture is the foundation for an individual´s predisposition to employ high or low construal levels. It also defines what distances are; it establishes at what point an object or an event (climate change) can be defined as socially, temporally and geographically distant or close, it influences the way in which

distance is approached and what role it plays in framing events, processes and abstract entities such as climate change.

Chapter 5

Conclusion or crossing the borders of climate change

To the extent possible in a dissertation, my work crossed the borders of climate change in a number of ways. Firstly, it challenged the current view of the relationship between migration and climate change by focusing on migrants as active agents within the climate change context. Secondly, it developed a combined and interrelated methodological framework to investigate climate change from the perspective of individuals, which allowed participants to freely express their meanings of climate. Most importantly, this study challenged, as did others that came before, the idea that climate change is exclusively a scientific issue. To the contrary, the previous chapters showed that climate change is a cultural and social issue, that individuals actively and dynamically make sense of it, and that people do not passively absorb scientific data and act according to this climate change information, as it is too often assumed in recent work carried-out by climate services and in the area of climate change communication. In sum, this study questioned pre-imposed concepts of climate change and crossed artificial borders between science and society. It disclosed the different socio-cultural dimensions of climate change and exhibited, as a spatial, temporal and social entity.

With these aspects in mind, I reflect in this last chapter upon the borders crossed during my research process and those that are yet to be investigated and, perhaps, to be crossed. In the first part of this chapter, I briefly introduce the key findings of my study. I continue by discussing how my study addresses certain conceptual and methodological gaps, and in turn, how it produces more of them. Drawing on the lessons learned along my research process and on the identified gaps of my study, I will suggest how future research might contribute to or further the discussion of culture, society, science and climate change. Finally, I will close this chapter and this dissertation by reflecting on the policy and social implications of my work.

5.1 Key findings

The overall objective of this thesis was to explore cultural framings of climate change, and, in particular, to investigate how individuals construct climate change as a cultural

object, going beyond the usual, powerful, scientific climate-change definitions prevalent in political or institutional media. The study was guided by two groups of research questions. The first were:

a) What are the perceived causes and consequences of climate change in different cultural groups?
b) What is the role of trust in institutions in climate-change perception across cultures?
c) What adaptation and mitigation measures are pinpointed by people holding different cultural backgrounds?

Results of this study revealed that culture mediates and informs the individual framing of climate change in multiple ways. The analysis of interviews undertaken with Italian and Chinese migrants in Hamburg and the T+TST carried out with different cultural groups showed that climate-change meanings are permeated by, expressed and assessed with the help of cultural worldviews, individual experiences and moral values. This study demonstrates how the individual perception of climate change goes well beyond scientific results and media communication. In fact, individuals employ their past experiences and familiar objects as meaning anchors (point of references) to make sense of climate change, and culture is the lens through which climate change is conceptualized and interpreted. This study found two crucial cultural aspects informing climate change meanings: a) culture-specific anchors and b) cultural conceptions of the self and the world. Both findings enabled insight into perceived causes and consequences, trust in institutions and preferred adaptation and mitigation measures which lie at the heart of my first research question.

The use of culture-specific anchors became particularly evident in the analysis of perceived causes and consequences of climate change. Regarding this finding, the present study showed a general lack of scepticism coupled with agreement on the anthropogenic causes of climate change. When asked about the consequences of climate change, participants widely identified weather patterns as concrete manifestations of climate change. Nevertheless, cultural groups differed with respect to typical weather changes and physical phenomena, while at the same time highlighting the relevance of physical place(s) experienced in the home country. The analysis clearly

revealed the importance of culturally familiar prototypes as anchors of meaning and the relevance of emplacement. For example, prototypical phenomena of climate change such as earthquakes and tsunami were found in the statements of Chinese interviewees, while they simply did not appear in the interviews with Italian citizens.

The second, crucial cultural aspect that shaped climate-change meanings was the culturally specific view of the self and the world. These views impacted both trust in institutions and the preference for certain adaptation and mitigation strategies. Simply put, there are important differences in the degree of the individualization of climate change, which, in turn, influenced participants´ answers on what should be done to tackle climate change and who should be in charge.

Differences in cultural framings of climate change were revealed, in particular, through the analysis of the interviews carried out with Italian and Chinese migrants, which were then analysed both in terms of content and linguistic structuration. This analysis revealed that the Italian culture of climate change was informed by an atomistic view of the world and showed a high degree of individualization: the problem of climate change was seen from the perspective of the self, and it was approached by looking at one aspect at a time, which was separated from the context. These features were characterized as a typically Western and reductionist approach. Furthermore, Italian interviewees showed a high degree of lack of trust in government, resulting in perceived individual responsibility to act against climate change. By contrast, in the analysis of Chinese tests and interviews, a collectivistic and holistic approach emerged. The individual level was not considered, and tackling climate change was conceived as a responsibility of the community, which is, strictly speaking, represented by the government. From a linguistic point of view, this was manifest through the predominant use of pronouns such as "us" while speaking about climate change, in contrast with the use of the individualizing "I" found in Italian interviews.

Contrasting with the atomistic Italian worldview, the holistic worldview permeated Chinese meanings of climate change. In fact, climate change was approached from a holistic perspective that emphasises the relationship between different elements contributing to climate change. This worldview, in turn, permeated the perception and

conceptualization of adaptation and mitigation strategies and measures. Nature and technology were not considered as dichotomous or opposed, but as equal parts of the same system that provided possible solutions for the climate change problem. The relationship between nature and technology provides a clear example of the multiple ways in which climate change, and more precisely adaptation and mitigation measures, are understood through cultural lenses and should, therefore be approached as cultural and place-based constructs.

The second guiding research question was:

1) How is climate change perception informed by geographical, temporal and social distances?

The analysis of T+TST as carried out with German and Taiwanese students provided an answer to this question. In this phase, I empirically investigated psychological distance from climate change and its three sub-dimensions: geographical, temporal and social. The analysis was theoretically supported by CLT, in order to unpack the different perceived dimensions of climate change and to investigate its implications. Results of the analysis showed that climate change was perceived to be geographically and temporally distant in both groups. On a closer look, however, differences among cultures were found. While climate change was considered to be distant, the temporal and spatial dimension of climate change turned out to be strongly informed by culture. In fact, the Taiwanese statements referred to the past, while the German conceptualisations focused predominantly on the future. Furthermore, students' statements differed in the perceived location of climate change which was identified in California and at the poles among Taiwanese students and in Bangladesh and the Netherlands among the German group.

The individualisation of climate change found in the interviews and discussed above was also found in the social dimension. Interestingly, Italian and German cultures may be characterised as independent (or individualistic) (Di Maggio & Zappulla, 2014; Richardson et al., 2014), while Chinese and Taiwanese cultures are conceived as interdependent (or collectivistic) (Gelfand et al., 2013; Ramaswami, 2014). The linguistic

analysis of German students´ statements showed the presence of the individual dimension ("I", "me") of climate change. This finding is congruent with those from the interviews undertaken with the Italians and contrasts strongly with the analysis of Taiwanese´s statements, in which the collectivistic dimension ("humans", "people") prevails.

In sum, the present study provides in-depth insights from the perspective of individuals, going beyond scientific definitions and simplistic ideas of the socio-cultural dimensions of climate change. My results highlight the multifaceted nature of climate change and its cultural embeddedness: familiar objects, experiences, prototypical (weather) phenomena, cultural worldviews of the self and the world serve as anchors and framework for ascribing meaning to climate change. Through the interaction of these cultural aspects and social measures, climate change materializes and becomes a meaningful social and cultural entity.

In the subsequent section, I reflect on the implications of these findings and of my research as whole, from a conceptual and a methodological point of view.

5.2 Conceptual advances, limitations and outlook

The general aim of this study consisted of exploring the variety of climate-change framings coexisting in the same physical space. The conceptual framework presented both advances of current knowledge on individual climate-change framings and challenges current scholarly approaches on at least three levels.

The first level of contribution is the focus on climate change from the perspective of the individual, which goes beyond scientific constructs of climate change. This focus is often neglected in the context of climate change, which is still considered the realm of natural sciences (Palsson et al., 2013; Hulme, 2009). It is, however, of crucial relevance to understanding how the physical climate change is converted into behavioural choices and encultured. An important contribution of this thesis thus lies in adopting the perspective of individuals, challenging the recurrent epistemologies which, instead, conceptualise the individual as empty boxes to be filled with information. Therefore, this study contributed to the body of knowledge on climate-change perception, and it

does so by identifying 1) recurrent categories appearing in the process of sense making of climate change, 2) objects and events employed as anchors of meanings, and 3) perceived dynamic temporal, geographical and social dimensions, permeating and structuring the construct of climate change.

The second conceptual contribution of this study lies in its cultural emphasis, largely absent in the discussions of climate change. While a number of studies have looked at how climate change might bear an impact on cultures (Adger et al., 2013; Strauss, 2012), this study takes a different perspective by looking at how culture impacts on climate-change perception and framing. In so doing, my research clearly questions the idea of climate change as an imposing, unequivocal and solid entity and shows how climate change is a perceived, constructed and differently framed by different cultures.

Third, this study takes a different direction from other studies through its innovative approach to the relationship between climate change and migration. An increasing body of scientific literature is dedicated to investigating how and whether migration is a consequence of climate change (Müller et al., 2014; McLeman, 2013; Adger et al., 2013). This strand, and this was my main criticism, neglects the potential contribution of migration for tackling climate change in the hosting places or countries. As discussed in Chapter 3.6, my study flows against the tide of these studies by focusing on migrants as active individuals rather than powerless victims of climate change. It recognizes their climate-change perception as valid, legitimate, and enriching at the local, regional and even national level.

While this dissertation constructively advanced knowledge on cultural climate-change framings, it is also characterised by a number of limitations. In the context of the conceptual framework, the main drawback is the narrow approach to culture employed in the study. As mentioned in Chapter 2, this issue is also reflected in the method employed, based on the assumption that one culture equals one country or territory and vice versa. The aim of the study, its temporal and economic restrictions made this conceptual restriction unavoidable, and its repercussions are evident at both the conceptual and empirical level. Throughout the study, culture is artificially approached as a conceptual and static entity bounded by political borders. This aspect is particularly

problematic as culture is, by definition, dynamic. This dynamism and, in particular, the fact that culture is in continuous development, is adaptive in space and in time, and transforms and is transformed, is neglected in this study. While my research offers insights on cultural framings of climate change, these only represent a snapshot of the individual´s culture, while failing to show its fluidity and malleability. In the specific case of migrants, this limitation is particularly influential, as migrants are in continuous negotiation with their own identity and culture, stretching from the culture of the country of origin to the one of the hosting country. Further research should address this issue and fill this gap by employing longitudinal studies that have the potential to grasp how culture and cultural framings of climate change develop in time, space, places and individuals.

Along the same lines, I argue that this study was only partially successful in identifying and systematically analysing how the culture of origin and the new culture merged to create a third, so-called mixed culture of climate change perception. The influence of the home country became evident in terms of worldviews, prototypical examples and experiences, but further efforts should be dedicated to analysing this in more depth, investigating, among other aspects, the role of place attachment (as discussed in Chapter 3.7). The question of how and why certain perceptual and behavioural aspects persist in a new physical environment while others are lost remains unanswered and is of vital interest. In sum, the present study conceptually represents only a first step on a long and challenging path towards a comprehensive understanding of the cultural framings of climate change.

5.3 Methodological advances, limitations and outlook

This study introduced a method traditionally applied in different fields of research: the TST. I applied this test to the context of climate change and designed the T+TST, which was coupled with in-depth interviews of Chinese and Italian participants. This choice can be considered innovative, not only for the application of the method itself and the change of the field of research, but also for the type of results generated. Indeed, this method allowed participants to spontaneously offer their climate-change framings, without any type of social or other contextual restriction. This focus on the interviewee and on his/her perception of climate change, beyond the scientific construct, also

characterized the second phase where in-depth interviews were carried out. As a result, cultural framings of climate change could emerge in their full complexity and enabled an in-depth analysis; they were unpacked and interpreted in a structured way. In this sense, the approach here employed conceptually challenges the tradition of studies on climate change perception that are often unconsciously informed by western-centric, deterministic and reductionist views. The present study looks at the question from a different angle and it, ultimately, represents one of the many underexplored methods that can be employed to investigate climate framings in a more open and culturally sensitive way.

It is important to note that while the innovation brought in by the T+TST represents one of the main contributions of this study, it also imports some limitations. In fact, the T+TST was of particular relevance in its second series of questions, namely for the statements on "climate change". The first series of statements "Who am I?" did not directly correspond with the research question on how different cultural groups perceive climate change, but it prepared the ground for the following phase of the test and allowed the interviewee to focus on him or herself. Depending on the aim of the research and on the need to encourage the participants be self-focused, future studies might rather omit, add on or focus on this first phase. For example, further studies that aim to explore the link between self-construal and environmental/climate-change perception might develop the T+TST by adding a third series of questions or by combining the test with other methods such as narrative interviews, focus groups or mobile methods. On the other hand, studies aiming at exploring climate-change framings among the public might benefit from a format which includes only "climate change" statements. Further limitations of the method and the issue of methodological nationalism and insider-outsider positionality are discussed in depth in Chapter 2.

In retrospect, I argue that the T+TST and in-depth interviews turned out to be coherent with the conceptual and epistemological position of this study and successfully raised data relevant to the research question. But I also believe that in order to benefit from its positive aspects and to minimize its limitations, this method should be approached in a flexible and problem-oriented way, and should be adapted to the research context.

5.4 Suggestions for further studies

Throughout the research process, including the study design, its implementation and the writing-up of results, a number of unsolved questions emerged. In addition to the above-mentioned conceptual and methodological suggestions for further studies, I identified two primary potential topics which would benefit from a deeper analysis: 1) the role of place attachment in climate-change perception and 2) the link between climate-change perception and behaviour.

The first field of study has attracted increasing attention in the last decades among scholars (Manzo & Devine-Wright, 2014; Chapin III & Knapp, 2015; Scannel & Gifford, 2011; Devine-Wright et al., 2015; Süsser, 2016). Such studies hold the merit of advancing the understanding of the role that place attachment and sense of place might play in climate-change perception and engagement. Nevertheless, to the best of my knowledge, no study has yet been devoted to investigating the role that place attachment(s) plays in climate-change perceptions among migrants. As highlighted by Lewicka (2011), one of the main challenges in the field of place attachment is investigating whether and how mobility and place attachment can be reconciled. In this sense, migrants would be an interesting group to be studied due to their plural identities, wide range of experiences and multiple emotional bonds with different geographical places. In the context of climate change, in particular, such an approach might, for example, investigate whether place attachment can be created or hindered through climate change. This would introduce a different and much-needed perspective on climate change, seen as a means to create social bonding and emotional bonding to place and therefore acquiring a positive connotation. Does involvement in climate change initiatives increase migrants' place attachment to the hosting country? What might be the consequences? And vice versa: does migrants´ place attachment (or lack of it) bear an impact on climate-change perception among local residents? How? Also drawing on the example of migrants, there is a need to take a closer look at how place attachment can focus on one place, encompassing local and global levels, and multiple places. The present study showed that climate change is represented in different geographical, temporal and social dimensions. How is this related with multiple levels of place attachment? Consequently, the focus on place attachment would offer the

opportunity to delve into people´s emotions and place(s) bindings that contribute to the process of climate change sense making.

The second potential direction for further studies concerns the link between perception and behaviour. The relationship between the two is far from being straightforward, and it encompasses a number of intersecting socio-cultural, economic and psychological factors (Bubeck et al., 2012; Gifford, 2013). Yet such complexity is often overlooked while the implementation of communication strategies based on people´s climate change meanings and emotions is considered a panacea for promoting individuals´ engagement (van der Linden et al., 2014; Corner et al., 2014; Roeser, 2012). On the one hand, such suggestions do recognize the importance of understanding the role of people´s sense-making and go beyond the purely scientific definition of climate change. On the other hand, focusing on communication and policies to trigger people to act again shifts the focus away from individual agency, because this approach reproduces the information-deficit model that conceptualises individuals as actors to be convinced rather than independent and autonomous actors who can actively take decisions (Jaspal et al., 2014). As such, the question of how individuals translate perception into behaviour, and which emotional and cognitive elements play a role in this process remains unsolved.

According to O´Brien (2013), the gap between knowledge and action can be addressed by looking at how the issue of change itself is approached individually and collectively, and what forces lead to change. Drawing upon my results, it is possible to identify two main elements that might promote change. The first is perceived responsibility for tackling climate change as found in the analysis of Chinese and Italian interviews. This aspect is strictly related to the concept of trust in institutions and the sense of agency, also highlighted in recent literature (Wibeck, 2014; Goodwin & Dahlstrom, 2014). Both are considered salient factors that might trigger engagement; in fact, individuals might decide to act or not depending on their assumptions about who should do so (individuals, community or institutions), and whether the responsible individual(s) or institutions are capable of doing so. The second force that might lead individuals to change their behaviour is the issue of psychological distance. In this sense, a great effort has to be made to openly consider the positive and negative aspects of both proximity

and distance. As also discussed in Chapter 4, there is an increasing urge to go beyond the assumption that for individuals only what is temporally, socially and spatially close matters. There is a need to broaden scholars´ horizons by investigating how the perceived global and future dimension of climate change might also lead to individual engagement with climate change.

In this section, I discussed some of the multiple ways in which scholars can look at climate change from the perspective of individuals in the future. Based on the findings and limitations of the present study, it seems of particular relevance to further explore how place attachment plays a role in climate-change perceptions and how climate change perceptions could contribute to become climate engagement. In both cases, the key is to be flexible in challenging previous assumptions within climate change research (O´Brien, 2013) and to maintain the focus on individuals and on the socio-cultural context.

5.5 Policy implications

Drawing upon the present study, it is possible to identify cultural aspects underlying climate-change framings that have an impact on the acceptance and active support of climate-related intervention. This contribution is of great relevance, considering that too often culture and worldviews are cited as crucial aspects to be taken into account in policy decision without them actually being taken into consideration. The present study fills this gap and provides an in-depth analysis of cultural meanings and framings held by different migrant communities. These results should not be generalized and transferred to other geographical areas and migrant communities without a critical perspective and a profound analysis of the new context. Nevertheless, the analytical framework of this study reveals aspects of climate change framings which are deeply informed by culture, namely trust in institutions, preference of adaptation and mitigation strategies and previous experiences. These and further context-specific aspects are of particular relevance in geographical areas where different cultures coexist and where mitigation and adaptation measures and climate communication strategies are planned and have to be coordinated. These characteristics belong to an increasing number of places worldwide, where cultural awareness can greatly contribute to designing interventions that appropriately address local needs.

It would be naïve to expect an implementation of a different measure for each culture existing at local levels. Nevertheless, I argue that the design process for climate policies and ultimately design implementation would benefit from openness to a variety of solutions informed by different cultures. Being receptive to non-Western perspectives of climate change holds the potential to identify creative and innovative solutions that can be successfully implemented at different local levels.

5.6 Societal Relevance

In the present research, I address an increasingly visible aspect lying at the core of the discussion revolving around climate change: the role of society. It has indeed become obvious how, in order to effectively tackle climate change, it is pivotal to consider individuals as a fundamental part of the entire picture. Notwithstanding this recognition, society is often seen as an "undefined blob" or "black box" expected to behave in a climate-friendly manner. As a consequence, predominant solutions are of a technical and scientific nature and simply ignore the role and relevance of the social. This perspective turns out to be problematic, as society and climate change are connected in much more profound and multiple manner. The only solution to effectively deal with climate change would be a profound social change (Gillard et al., 2016).

Referring back to Sonnenfeld model (1972) with which I introduced my work, my research intended to explore perceptual climate change which is too often overlooked. Within the perceptual climate-change context, many questions are still unsolved and are of great relevance while some of them were discussed in previous sections (5.3, 5.4). In my research, I aimed at contributing to the knowledge of cultural perceptual climate change by focusing on migrants´ framings of climate change. Through this approach, I was able to bring to light the variety of meanings of climate change existing within a physical space. I deconstructed the predominant accounts of climate change as merely an objective and scientific issue made up of numbers, predictions and graphs, which are in themselves cultural practices and ascription of meaning. I also contributed to reclaiming or even recapturing climate change as a topic embedded in culture and framed through individual experiences, emotions and worldviews. In this sense, the focus is on people and society, acknowledging local knowledge and framings as crucial

aspects to be taken into account in the process of adaptation and mitigation to climate change. The social implication of this approach is an inclusive and locally based perspective. In fact, this research raises a too-often unasked question about what can be effectively considered inclusive climate change policy. “Inclusive” is often understood as involving local population in the decision-making process. But the present study elaborates on a further question: what is taken into account as “local population” and what is not? By focusing on migrants, my research challenges the common understanding of local actors, introducing migrants´ potential agency on climate change.

Last but not least, this study triggers a societal reflection on our own culturally constructed forms of framings. It opens up Pandora´s box: questions about the nature of our understanding of climate change become increasingly pressing. Why do we perceive certain phenomena as causes and consequences of climate change while we overlook others? How does our perception of the temporal, geographical and social dimension of climate change influence our general framing and our engagement with it? What are the cultural features that make certain adaptation and mitigation measures acceptable and others not? How do previous experiences as individuals and as communities inform our climate change framings and our climate behaviour? This dissertation productively deconstructs and unmasks the cultural nature of our cognitive, emotional and behavioural engagement (or lack of) with climate change, it makes the familiar and everyday life less obvious and the differences more understandable. By taking a step back, adopting a critical perspective on our own culture and exploring different cultures of climate change, it will be possible to widen our understanding of climate change, identify potential solutions and trigger more grounded analysis of or confrontation with what climate change actually is.

In conclusion, climate change is often claimed to be a great, and until now unaccomplished, scientific opportunity for fostering cooperation, exchange and knowledge co-production between natural and social sciences. Nevertheless, this work showed how climate change also represents a unique social opportunity to critically reflect upon our culture and the role it plays in our climate-change framings and behaviour. When this social opportunity is seized, a cultural transformational social

process will finally take place, meeting the complex demands with which climate change confronts every one of us.

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Related publications

Elements of this manuscript appeared or are about to appear in the following publications:

de Guttry C, Döring M, Ratter B (2016) Challenging the current climate change – migration nexus: exploring migrants´ perceptions of climate change in the hosting country. Die Erde 147(2):109-118.

de Guttry C, Döring M, Ratter B (2017) How distant is climate change? Construal Level Theory analysis of German and Taiwanese students´ statements". International Journal of Asian Social Science 7(5):434-447.

de Guttry C, Süsser D. Döring M, (in review) Untying the climate knot: An analysis of psychological distances and proximities permeating climate change meanings in North Frisia.

Appendix A_1: Ten plus Ten Statements Test Italian

Per favore, riempi gli spazi vuoti con delle frasi che riguardano te stesso. Scrivi le frasi nell´ ordine in cui ti vengono in mente e come se tu stessi rispondendo alla domanda “Chi sono?” a te stesso, non a qualcun´ altro. Il questionario rimarrá anonimo.

CHI SONO?

1. **1.**
2. **2.**
3. **3.**
4. **4.**
5. **5.**
6. **6.**
7. **7.**
8. **8.**
9. **9.**
10. **10.**

Per favore, riempi gli spazi bianchi con delle frasi riguardanti il “cambiamento climatico”. Non esiste una risposta “giusta” o “sbagliata” ed il test è anonimo.

CAMBIAMENTO CLIMATICO:

I.

II.

III.

IV.

V.

VI.

VII.

VIII.

IX.

X.

Appendix A_2: Ten plus Ten Statements Test Taiwanese

我是誰？

請寫下當你看到這個問題時，腦海里浮現的直覺答案。該答案僅僅是你對自己的看法和敘述。該答案不涉及任何外界評價，也無關對錯，沒有10個答案也無需勉強。

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

氣候變遷

請寫下當你看到“氣候變遷”這個詞的時候，腦海里浮現的直覺聯想或思考。該答案不涉及任何外界評價，也無對錯，沒有10個答案也無需勉強。

I.

II.

III.

IV.

V.

VI.

VII.

VIII.

IX.

X.

Appendix A_3: Ten plus Ten Statements Test Peruvian

Por favor, rellene este cuestionario con frases o palabras sobre usted mismo/a. Escriba como si estuviera contestando a la pregunta “quien soy?” a usted mismo, y no a otra persona. El cuestionario es anónimo.

QUIEN SOY?

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

Por favor, escriba unas frases o palabras sobre el cambio climático. No hay una respuesta correcta o incorrecta y este cuestionario es anónimo.

CAMBIO CLIMÁTICO

I.

II.

III.

IV.

V.

VI.

VII.

VIII.

IX.

X.

Datos Anagráficos

Sexo: [ ]Masculino [ ]Femenino

Edad:_____

Nacionalidad:_____

Desde cuando vive usted en Hamburg?_____

Escolaridad_____

Ocupación_____

Muchas gracias por su colaboración

Appendix B_1: Interviews Framework in English

Questionnaire

Number: Rec ID: CH_

Date:

Place:

Notes:

QUESTIONS	
1. *Have you ever heard of climate change (c.c.)?* *How you got this information?* *What do you think about the information received?*	Sources of info
2. *What is c.c. for you?*	General framing

3. *What do you think are the causes of c.c.?*	Causes
4. *Do you think you are somehow contributing to c.c.?* *How?* *In the past?*	Projection of self
5. *Which are the consequences of c.c.?* *Can you think to 1 or + risks associated to c.c.?*	Consequences
6. *Do you feel personally threatened by c.c.?* *When do you think c.c. will happen?(/the effect of c.c. will be perceptible?* *Where do you thimk c.c. will happen?* *Do you think c.c. will affect someone? Who?*	Psychological distance Temporal Geographical Social
7. *Have you ever experiences a natural disaster?* *Was it associated with c.c.?* *What happened?* *When?* *Where?*	Experience
8. *How serious is c.c. in Hamburg/ Germany? In your country?*	Severity

9. Can you think of something that could be done to face c.c.?	*Adaptation and/orMitigation*
10. Who do you think is in charge of "doing something" to face c.c.?	*Role of institutions*
11. Do you think your city is doing something to face c.c.?*	*Local perception*
12. Do you think you could eb able to do something by your own to face c.c. related risks? *(why not?)* *What?* *Would it work? Why?* *Would it be wothwhile?*	*Perceived response efficacy and Perceived response costs*
13. What kind of information would you like to receive regarding c.c. (If so?)	*Info*
14. Is there anything else you would like to tell me?	

Gender: Age:

Place of origin: Place of living:

In Germany since: In Hamburg since:

Educational Level: Occupation:

> Where do you feel “at home”?

> Are you thinking to return in your country of origin?

> Do you feel integrated here in Germany? In Hamburg? Why (not)?

Appendix B_2: Interviews Framework in Italian

Questionnaire

Number: Rec ID: IT_

Date:

Place:

Notes:

QUESTIONS	
1. *Hai mai sentito parlare di cambiamento climatico?* *Dove/da chi ne hai sentito parlare?* *Cosa ne pensi delle informazioni che hai ricevuto?*	Sources of info
2. *Cos´é il cambiamento climatico per te?*	General framing

3. *Quali sono secondo te le cause del cambiamento climatico.?*	Causes
4. *Pensi di aver/ aver avuto un ruolo nel cambiamento climatico?* *Come?*	Projection of self
5. *Quali sono secondo te i rischi/ le conseguenze del cambiamento climatico?*	Consequences
6. *Pensi di essere personalmente a rischio delle conseguenze del cambiamento climatico? Quando pensi che gli effetti del cambiamento climatico saranno visibili?* *Dove?* *Chi ne verrá colpito?*	Psychological distance Temporal Geographical Social
7. *Hai mai avuto esperienza diretta di un disastro naturale?* *Pensi che fosse associato al cambiamento climatico?* *Cosa é successo? Dove? Quando?*	Experience
8. *Quanto é grave secondo te il cambiamento climatico? Quanto quí? in Italia?*	Severity
9. *Secondo te c´é qualcosa che si potrebbe fare contro il cambiamento climatico?*	*Adaptation and/orMitigation*

10. *Chi pensi che dovrebbe fare qualcosa al riguardo?*	*Role of institutions*
11. *Secondo te la tua cittá* sta facendo qualcosa per mitigare o adattarsi al cambiamento climatico?*	*Local perception*
12. *Pensi che saresti capace di fare qualcosa nel caso di un rischio/evento correlato al cambiamento climatico? Perché no? `* *Cosa faresti?* *Funzionerebbe? Perché si/no?* *Ne varebbe la pena?*	*Perceived response efficacy and Perceived response costs*
13. *Che tipo di informazione vorresti avere riguardo al cambiamento climatico? (se?)*	*Info*
14. *C´é qualcosa che vorresti aggiungere?*	

Sesso: M F Etá:

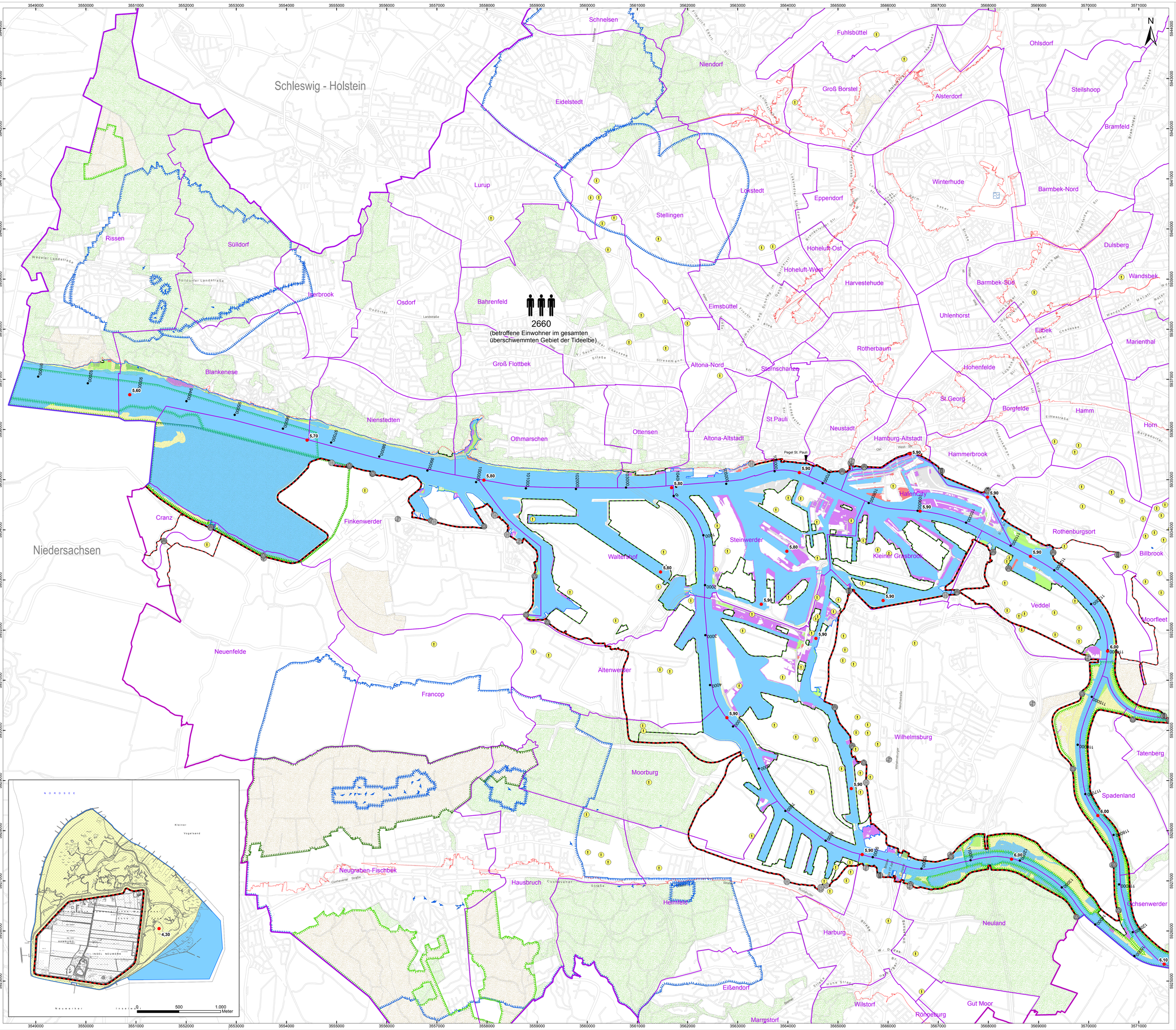
Dove vivi? Da dove vieni?

Piú alto livello di educazione completato? Lavoro:

- Dove ti senti a casa?
- Stai pensando di tornare in Italia?
- Ti senti integrato qui? Perché si/no?

C´e´ qualcuno che conosci che potrei contattare per fare quest´intervista?

Appendix C_1: Flood prone area Hamburg



Betroffene Einwohner

- < 100
- 100 -1000
- > 1000

Gefahrenquelle

- Industriebetriebe

Flächennutzung

- Wohnbauflächen; Flächen gemischter Nutzung
- Industrie- und Gewerbeflächen; Flächen mit funktionaler Prägung
- Verkehrsflächen
- Landwirtschaftlich genutzte Flächen; Wald, Forst
- Sonstige Vegetations- und Freiflächen
- Sport-, Freizeit- und Erholungsflächen
- Gewässer und Gewässerrückhalteräume

Schutzgebiete

- Naturschutzgebiet
- Landschaftsschutzgebiet
- Flora-Fauna-Habitat Gebiet
- Vogelschutzgebiet
- Wasserschutzgebiet
- Badegewässer

Bauwerke und Anlagen

- Deichsiel
- Sperrtor/Dammbalkenverschluss
- Schöpfwerk
- Schleuse
- Sperrwerk

4500 Gewässerstationierung in Flussmeter nach Wasserrahmenrichtlinie

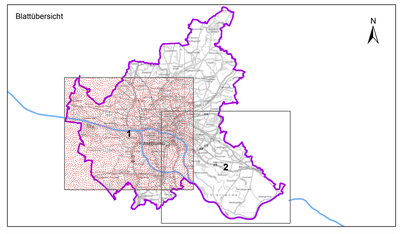
- Grenze der überschwemmten Fläche bei einem Wassersand St. Pauli 5,90 m NN
- Grenze des Risikogebietes der Tideelbe
- Landesgrenze
- Stadtteilgrenze

- Wasserstand beim häufigen Ereignis [m NN]
- Öffentliche Hochwasserschutzanlagen
- Öffentliche Hochwasserschutzanlagen hinter Sperrwerken oder tidefreien Gewässern
- Private Hochwasserschutzanlagen

0 500 1.000 1.500 2.000 2.500 Meter

Rechtsgrundlage:	§ 74 Wasserhaushaltsgesetz in Verbindung mit Art. 6 der EG-Hochwasserrisikomanagement-Richtlinie
Quellenangaben	
Private Hochwasserschutzanlagen:	Hamburg Port Authority 2013
Sonstige Bauwerke und Anlagen:	Behörde für Stadtentwicklung und Umwelt 2012
Schutzgebiete:	Behörde für Stadtentwicklung und Umwelt 2011
Industriebetriebe:	Behörde für Stadtentwicklung und Umwelt 2011 (IED-Anlagen)
Einwohnerdichten:	Statistisches Amt für Hamburg und Schleswig-Holstein 2011
Digitales Geländemodell:	Landesbetrieb Geoinformation und Vermessung, Befliegung 2010
Flächennutzung:	Landesbetrieb Geoinformation und Vermessung 2010
Landesgrenze und Stadtteile:	Landesbetrieb Geoinformation und Vermessung 2011
Kartengrundlage: Bezugssystem GK3/DHDN:	Digitale Stadtkarte1:60000, Vervielfältigung mit Erlaubnis der Freien und Hansestadt Hamburg, Landesbetrieb Geoinformation und Vermessung 2009
Hydraulische und hydrologische Berechnung:	Landesbetrieb Straßen, Brücken und Gewässer 2013

Blattübersicht



Flussgebietsgemeinschaft Elbe
Koordinierungsraum Tideelbe

FGG ELBE

Hochwasserrisikokarte
Hochwasser mit hoher Wahrscheinlichkeit
(20-jährliches Ereignis - HW 20 St. Pauli 5,90 m NN)

High H

Freie und Hansestadt Hamburg
Behörde für Stadtentwicklung und Umwelt, Amt für Umweltschutz

Gewässer: **Tideelbe**

LSBG Landesbetrieb Straßen, Brücken und Gewässer Hamburg	22.12.2013	Maßstab: 1:25000	Blatt 1 (von 2)

Appendix C_2: Flood prone area Hamburg

Schleswig - Holstein

Niedersachsen

2660
(betroffene Einwohner im gesamten überschwemmten Gebiet der Tideelbe)

Betroffene Einwohner
- < 100
- 100 -1000
- > 1000

Gefahrenquelle
- Industriebetriebe

Flächennutzung
- Wohnbauflächen; Flächen gemischter Nutzung
- Industrie- und Gewerbeflächen; Flächen mit funktionaler Prägung
- Verkehrsflächen
- Landwirtschaftlich genutzte Flächen; Wald, Forst
- Sonstige Vegetations- und Freiflächen
- Sport-, Freizeit- und Erholungsflächen
- Gewässer und Gewässerrückhalteräume

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- Wasserschutzgebiet
- Badegewässer

Bauwerke und Anlagen
- Deichsiel
- Sperrtor/Dammbalkenverschluss
- Schöpfwerk
- Schleuse
- Spenwerk

4500 Gewässerstationierung in Flussmeter nach Wasserrahmenrichtlinie

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- Öffentliche Hochwasserschutzanlagen hinter Sperrwerken oder tidefreien Gewässern
- Private Hochwasserschutzanlagen

0 500 1.000 1.500 2.000 2.500 Meter

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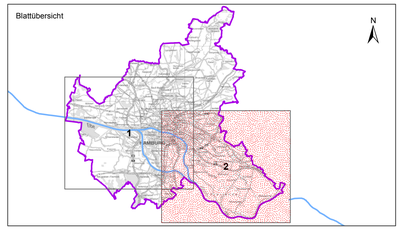
Kartengrundlage: Bezugssystem GK3/DHDN:	Digitale Stadtkarte1:60000, Vervielfältigung mit Erlaubnis der Freien und Hansestadt Hamburg, Landesbetrieb Geoinformation und Vermessung 2009
Hydraulische und hydrologische Berechnung:	Landesbetrieb Straßen, Brücken und Gewässer 2013

Blattübersicht



Flussgebietsgemeinschaft Elbe
Koordinierungsraum Tideelbe

Hochwasserrisikokarte
Hochwasser mit hoher Wahrscheinlichkeit
(20-jährliches Ereignis - HW 20 St. Pauli 5,90 m NN)

High H

Freie und Hansestadt Hamburg
Behörde für Stadtentwicklung und Umwelt, Amt für Umweltschutz

Gewässer: **Tideelbe**

LSBG Landesbetrieb Straßen, Brücken und Gewässer Hamburg	22.12.2013	Maßstab: 1:25000	Blatt 2 (von 2)