The evolution of climate change narratives: Analysis of metaphor scenarios in four genres

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Abstract:

This research demonstrates the evolution of climate change metaphors in a corpus composed of articles from four genres: British newspapers, international scientific journals, environmentalist communication in the UK, and British political speeches. This comparison establishes how metaphors originating in scientific discourse are adapted in different types of discourse about climate change. We investigate such adaptations to determine if the interpretation of metaphors differs in the four genres.

To build a conducive corpus, we use the *Nexis* database for the analysis of British newspapers, the *Web of Science* archives for the analysis of scientific articles, the *Friends of the Earth* press releases for the analysis of environmental communication, and the *BritishPoliticalSpeech* database for the analysis of political speeches. We identify metaphors such as *greenhouse effect, carbon footprint, Mother Nature, climate forcing*, discussed in existing literature (e.g., Koteyko 2010; Nerlich 2010; Nerlish & Hellsten 2014; Atanasova & Koteyko 2017; Flusberg, Matlock & Thibodeau 2017; Deignan, Semino & Paul 2019). We supplement our research by consulting the *British National Corpus* to establish a semantic link between different occurrences and how they occur in different narratives (Bamberg & Andrews 2004). Additionally, we manually analyse a sample of our corpus to observe metaphors not previously discussed in existing literature.

These steps led us to focus on 8 main narratives associated with 8 metaphorical domains FAMILY/ HOME, a RELIGION, a DAMAGED BODY, a DAMAGED CONTAINER, a TRANSFORMED HOUSE, a DANGEROUS TRACE, a CRASHING TRANSPORT, and a CONFLICT. These narratives are regrouped into four general perspectives on climate change observed in the four genres: the eulogy of nature, the deterioration of nature, the materialisation of pollution, and the doom prediction. The distribution patterns of scenarios in each genre shows that relevant metaphorical descriptions are specific to each genre and climate change events which have had an impact on communication.

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List of Abbreviations:

BNC: *British National Corpus*

CCS: Carbon Capture and Storage

CMT: Conceptual Metaphor Theory

ENV: Environmentalist extracts from *Friends of the Earth*

GDP: Gross Domestic Product

GMO: Genetically Modified Organism

GWP: Global Warming Potential

HCFC: Chlorofluorocarbon

IPCC: Intergovernmental Panel on Climate Change

MIP: Metaphor Identification Procedure

NEW: Newspaper extracts from *Nexis*

NGO: Non-Governmental Organisation

OED: *Oxford English Dictionary*

OPEC: Organisation of the Petroleum Exporting Countries

POL: Political Speeches from *BritishPoliticalSpeeches.org*

ppm: parts per million

SCI: Scientific extracts from *Nature*

WTO: World Trade Organisation

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Chapter 1: Introduction

This research investigates the development of climate change metaphors in four genres: British newspapers, international scientific journals, environmentalist communication, and British political speeches. The population's acknowledgement of environmental issues and the misunderstanding associated with climate change promoted our interest in climate change metaphors. For example, the scientific uncertainty regarding particular aspects of the topic, the associated scandals (e.g., the "Climategate" scandal, see Chapter 2, section 2.6.2.), and the disapproval of particular environmental policies (e.g., carbon tax) have impacted the population's view on the significance of the issue.

The study of metaphors is significant because their figurative meaning can help metaphor recipients to understand complex concepts, such as the ones at play in climate change communication. Metaphors are useful communicative tools to popularise a scientific topic. However, metaphors used in a scientific context employ highly precise figurative meaning whose specific characteristics may not be fully acknowledged by the people who (re-)use them (e.g., the *greenhouse effect* metaphor). These metaphors comprise significant features which are likely to be adapted in various genres.

Additionally, the discussions about climate change give rise to a wide variety of subjective descriptions and authorial stances. The main hypothesis of our research is related to the plurality of meanings that climate change metaphors acquire depending on the nature of the discourse in which they are used and the users' argumentative purposes. These argumentative purposes reveal new metaphorical meanings which can be in contradiction to the (original) scientific meaning. Our study contributes to existing research by investigating scientific and argumentative metaphorical meanings in different genres and periods. We show that scientific metaphors are also subject to argumentative adaptation in the same way political or advertising metaphors are.

1.1.Aims of the research

Our research investigates metaphorical adaptation to answer three main research questions. The four genres under study, i.e. British newspapers, international scientific journals, environmentalist communication, and British political speeches, allow us to answer these three main research questions.

RQ1: Which metaphorical narratives and scenarios are used in journalistic, scientific, environmental and political discourse about climate change?

RQ2: What is the distribution of these metaphorical narratives and scenarios across the four genres?

RQ3: To what extent, if at all, has the production/adaptation of these metaphorical narratives and scenarios been influenced by climate change-related events?

First, our research shows that similar metaphors are used in different genres because these help to identify complex characteristics of climate change. The nature of the topic leads us to assume that the associated vocabulary (including metaphors) originates in scientific communication. We question this assumption by investigating whether other genres can rely on metaphors which may or may not share particular features with scientific vocabulary. Additionally, the intention was to explore whether popular genres like newspapers rely on metaphors observed in scientific papers and/or whether scientific papers also rely on metaphors typically observed in more popular genres. We focus on newspapers as an example of popular genre which can describe climate change by referring to science or to more partisan discourses. We compare the metaphors from newspapers with metaphors observed in political speeches which present an established opinion on British environmental concerns. The environmental communication can rely on scientific findings to advertise climate mitigation. We investigate this adaptation by paying attention to the argumentative function of metaphors. This investigation is presented in Chapters 4 to 7 and highlights the alteration of meaning that can arise when a metaphor is "transferred" from one genre to another (research question 1).

We discuss the second aspect of our research in the first half of Chapter 8 which focuses on the constitutive characteristics of some metaphors and on the sporadic occurrences of other metaphors. We determine the relevance of particular metaphorical occurrences with quantitative findings and we compare the metaphors which mainly occur in specific genres with the metaphors which are more rarely used in the genres under study (research question 2).

Thirdly, the corpus we have set up for this research does not only allow the examination of metaphorical adaptation in genres but also in time. This diachronic study is presented in the second half of Chapter 8. This chronological investigation has been motivated by the assumption that pioneering scientific findings about climate change, particular environmental decisions taken by politicians, and the variety of scandals the topic is associated with (e.g., the "Climategate" scandal; see Chapters 2, section 2.6.2.) may have affected the development and use of metaphors over time. We study whether these related events have had an influence on the use of metaphors in the four genres. We present quantitative findings to determine whether an event has promoted a particular metaphorical conceptualisation of climate change (research question 3).

1.2.The significance of metaphor narratives and scenarios

Throughout our research, we rely on existing findings about metaphors in climate change discourse. We draw in particular on the work of Deignan, Semino and Paul (2019) who compare three genres: scientific journals, science textbooks, and students' interviews. They highlight significant misunderstanding of the meaning of climate change metaphors. While their study focuses on the "accurate" meaning of metaphors in scientific papers as opposed to the altered interpretation of metaphors used in textbooks and students' interviews, we show that the alteration of meaning of climate change metaphors cannot only be attributed to an inaccurate interpretation but also to a subjective perspective on the topic. We pay attention to the co-text to establish the plurality of metaphorical meanings which can be exploited not only in different genres but also within the same genre, depending on the metaphor user's communicative goal or on the period of use.

Atanasova and Koteyko (2017a) and Flusberg, Matlock and Thibodeau (2017) published significant findings about the ideological function of metaphors in climate change discourse (see Chapter 2). However, none of these studies focuses on the adaptation of climate change metaphors in different genres which can alter the function observed in the "original" metaphorical use (e.g., environmentalist versus sceptical stances). These studies distinguish metaphors which can promote actions (CLIMATE CHANGE AS A WAR, as in "When will Americans start to *combat* excessive energy use and *kill* the problems?"; Flusberg, Matlock, & Thibodeau 2017: 772; see also Atanasova & Koteyko 2017a) from metaphors which are less effective in convincing people about the urgency to tackle the issue (CLIMATE CHANGE AS A RACE; as in "When will Americans *go after* excessive energy use and *surge ahead* on problems?"; Flusberg, Matlock & Thibodeau 2017: 772) or which favour sceptical arguments (CLIMATE CHANGE AS A RELIGION as in "They (G8 leaders) are like *medieval preachers* proclaiming to baying crowds that the end of the world in nigh"; Atanasova & Koteyko 2017a: 460). By contrast, our research investigates a wider range of argumentative stances to possibly observe the different functions of climate change metaphors. Nerlich (2010) shows that climate change-related scandals have had an influence on the use of metaphors. However, her approach is mainly quantitative: her findings show higher frequencies of CLIMATE CHANGE AS A WAR and CLIMATE CHANGE AS A RELIGION metaphors when the scandals occurred. By contrast, our research also focuses on the alteration of metaphorical meaning such events can promote (e.g., THE CLIMATE WAR becomes A CRIME). Koteyko, Thelwall, and Nerlich (2009) study the different interpretations of the metaphorical compound *carbon footprint* (e.g., interpretations related to lifestyle, finance, and evaluation). Their results are relevant to our research interests and they will be supplemented with genre-specific and diachronic analyses.

This thesis expands the focus on metaphors to include narratives and scenarios. On the one hand, metaphor narratives rely on the concept of "frame", i.e. the semantic link that can exist between different metaphorical occurrences helps the metaphor users to depict an issue through a limited scope that focuses on particular aspects of the topic (Reddy 1993; Trumbo 1996; Lakoff 2004; 2010; Fillmore 2006; Olausson 2009; Greco Morasso 2012). Narratives have been defined as "metaphorical frame" (Bamberg & Andrews 2004; Bamberg & Georgakopoulou 2008; Hoffmann 2010; Hanne, Crano &

Mio 2014): the identification of narratives reveals a semantic link between metaphors in a specific discourse. When these metaphors are associated, this semantic link can highlight the presence of ideologically oriented elements. The ideological orientation of metaphorical elements thus reveal a narrative through which the topic is understood. Narratives involve particular expectations regarding some aspects of the topic and help the metaphor user to paint an effective picture of the topic which fits his/ her own interpretation (Hellsten 2002; Bamberg & Andrews 2004; Bamberg & Georgakopoulou 2008; Hoffmann 2010; Hanne, Crano & Mio 2014; Sinding 2017; Musolff 2019).

On the other hand, metaphor scenarios reveal how the metaphorical concept can be exploited to suit the metaphor user's intended meaning and to fulfil particular ideological stances (Musolff 2004a; 2004b; 2016a). A scenario can rely on negatively oriented characteristics (e.g., "the *weakening* of the euro" 2004a: 85) and, in other cases, on positively oriented characteristics (e.g., "the *strengthening* of the euro", 2004a: 85) which lead to a different perception of the topic. These attributed characteristics can fulfil opposite ideological stances (e.g., opinions about the euro). The scenarios can alter the narrative in which they are included by relying on ideologically oriented elements (e.g., strength or weakness) whose perception by metaphor recipients leads to different expectations regarding the topic (Musolff 2004a; 2004b; 2016a).

Metaphor narratives and scenarios help to answer our research questions. On the one hand, they establish a semantic link between several metaphorical occurrences, which can lead to different interpretations of the topic. These metaphorical descriptions may be specific to one genre or to a particular period. On the other hand, narratives and scenarios offer a view on the various ways in which the metaphorical meaning can be adapted. They can establish a relationship between particular adaptations and particular ideologies. These approaches on metaphors are relevant because climate change can give rise to a wide range of different ideologies which can attribute different characteristics to the metaphorical concepts and/ or question the characteristics that have been attributed in another genre.

We supplement narratives and scenarios with the perspectives adopted to discuss climate change in each genre. These perspectives constitute a necessary contribution to existing studies: perspectives emphasise the aspects of climate change which are

metaphorically described by narratives and scenarios in the four genres (e.g., pollution, environmental decisions, scientific experiments and hypotheses, and climatic predictions). Here, we focus on four main perspectives, i.e. four main aspects of climate change: the eulogy of nature, the deterioration of nature, the materialisation of pollution, and the doom prediction about climate change. Each of these four perspectives is composed of particular narratives and scenarios.

1.3.Particularities of our corpus

Our corpus is composed of four different genres, namely, British newspapers, scientific articles from *Nature*, environmental communication from *Friends of the Earth*, and British political speeches. These four genres have been of particular interest because each of them discusses climate change according to specific stances. Newspapers popularise the topic (and share opinions about it) for a wide readership. The particularities regarding the editorial stance of each newspaper, but also the regularity of publications provide a significant space for metaphorical uses. The scientific papers present highly specific knowledge on the topic, and they are aimed at readers who possess similar interest and knowledge (to some extent). These articles must respect some objectivity related to the reviewing process required for publication in a high-impact journal such as *Nature*. The environmentalist communication focuses on climate actions and emphasises the need to repair the damages caused by climate change. Additionally, they present particular knowledge regarding the topic which is, in this case, adapted to a wider readership. The study of political speeches helps us to observe a well-delineated stance on the topic depending on the political ideology. These speeches can also be action-oriented because political decisions involve the enactment of particular policies which can then be discussed and questioned.

The timespan established for the research starts in 1984 and finishes in 2017. This specific period has been of interest because 1984 represents the first year during which climate change has been discussed as a particular phenomenon in UK newspapers (rather than a series of unrelated weather events), and 2017 represents the year during which our research has started.

This 33-year timespan and the study of four genres results in a large corpus which displays a wide range of metaphorical adaptations and different argumentative stances on climate change.

1.4.Thesis structure

The next chapter discusses the relevant approaches to metaphor studies necessary to understand how the concepts of scenarios and narratives can be applied to our research. The chapter starts with the different definitions attributed to the term "metaphor" which we enrich with explanations of the associated vocabulary. We then focus on the particularities of the analysis of metaphors in a corpus, with a focus on the interpretation of metaphors. We discuss existing findings about climate change metaphors and about the characteristics of such a discourse. We end the review of existing literature with explanations about metaphor narratives and scenarios, and we justify our reliance on these approaches.

In chapter 3, we provide information about the methodological steps that we have performed to answer our three research questions. We first explain the selection process undertaken prior the composition of our corpus. We then clarify the methodology that we have used to retrieve data from a large corpus and explain our reliance on an electronic corpus to supplement the selection of data. In the second part of this chapter, we focus on the process of metaphor identification and analysis with reliance on the "Metaphor Identification Procedure" (Steen et al. 2010). The MIP establishes five steps to document the metaphorical meaning of an expression in a text (Steen et al. 2010), which we adjust to the results provided by the electronic corpus. We also explain how we rely on existing findings about climate change metaphors and on the lexicalised meaning of such metaphors in the *Oxford English Dictionary* (online version). In the third part of this chapter, we illustrate how we have established the distribution patterns and the chronological findings which help us answer our second and third research questions.

In chapter 4, we analyse the metaphor narratives and scenarios related to the eulogistic perspective on (unaffected) nature. This perspective is composed of several narratives establishing the positive features conveyed by the UNAFFECTED ENVIRONMENT AS GREEN scenario, by the narrative EARTH AS A HOME and

HUMANITY/NATURE AS A FAMILY, and the narrative CLIMATE CHANGE AS A RELIGION. We also focus on the questioning of such positive descriptions of the pre-industrial environment and on the different stances about climate change.

In chapter 5, we discuss the perspective of the deterioration of nature through two main narratives. The first one establishes NATURE AS A BODY which is DAMAGED by climate change. The second one identifies NATURE AS A DAMAGED CONTAINER whose DAMAGED ZONE leads to the LOSS of necessary/ dangerous elements which can be CAPTURED by humans.

In chapter 6, we study the scenarios and narratives associated with the materialisation of pollution. We identify the narrative which pictures THE EARTH AS A TRANSFORMED HOUSE BUILT OUT OF POLLUTION. We also focus on the scenario which describes THE EARTH AS A SHARED HOME whose quality is affected by the presence of a DANGEROUS TRACE formed out of pollution.

In chapter 7, we discuss the perspective of doom prediction, through an emphasis on the danger of climate change. This perspective gives rise to two main narratives. The first one pictures the effect of environmental decisions as A CRASHING TRANSPORT. The second one depicts CLIMATE CHANGE AS A CONFLICT through an emphasis on the uncertainty regarding NATURE'S REACTIONS.

While Chapters 4, 5, 6, and 7 provide answers to our first research question, Chapter 8 is divided into two main parts which respectively answer our second and our third research questions. In the first half of Chapter 8, we rely on the distribution patterns of the scenarios analysed in the previous chapters and we investigate the scenarios and narratives which prevail in each genre (newspaper articles, international scientific journal, publication from Non-Governmental Organisation, and British political speeches). We then investigate the chronological evolution of these scenarios and narratives to establish the influence of climate change-related events on metaphorical use.

In Chapter 9, we answer the research questions and we discuss our findings established in the previous chapters to complement existing literature on metaphors and climate change discourse with reference to the perspectives, narratives, and scenarios.

We end this thesis with a main conclusion which draws on the main findings resulting from our analysis of narratives and scenarios about climate change.

Chapter 2: Relevant approaches on metaphor analysis in discourse about climate change

2.1. Introduction

This study establishes how climate change metaphors are adapted in different genres and periods. We rely on the hypothesis that the recontextualisation of metaphors may affect the metaphor recipient's interpretation and understanding of the topic. Climate change discussions display significant patterns since they give rise to contradictory opinions and involve various fields of expertise (see below). Metaphors are intended to ease the communication of such a knowledge and opinions, and some metaphors have even become the established way of dealing with this topic.

This observation raises questions about potential misinterpretation and about the reason why the metaphor users rely on metaphors. Different genres and different periods (1984-2017) are focused on in this study: the specificities of these four genres (newspapers, scientific articles, environmentalist communication, and political speeches) need to be investigated as they are relevant to the interpretation of metaphors.

First, it is necessary to define what a metaphor is because this linguistic device has received a number of different definitions. We specify the approaches relevant to this study: the cognitive approach, the pragmatic approach, and the corpus approach. We discuss the different views on metaphorical production and understanding highlighting the importance of context to the understanding of the meaning of a metaphor and its function. We investigate the relationship between metaphors and genres with a focus on climate change discourse.

2.2. Conceptual Metaphor Theory

Conceptual Metaphor Theory (CMT) defines metaphors in terms of everyday experiences that lead the metaphor user to mentally associate an abstract concept with a more concrete one (Lakoff & Johnson 2002: 5). This view has been important in the study of metaphors because it differs from prominent views of the past which assigned metaphors to literary or poetic writings (see Goatly 1997: 1; Deignan 2005: 2-4).

Several previous studies have influenced this conceptual perspective beginning with Aristotle who argues that analogies may help to understand reality (Aristotle trans. 1966 quoted after Kittay 1987: 3-4). Vico (1977) relates metaphors to human bodily experiences that project elements together in the imagination (Vico 1977 quoted after Leezenberg 2001: 62-3). Richards (1936) recognises two elements composing the metaphor which are related to each other because of their similarities (1936: 22-3). Black (1962) addresses the questions of metaphor identification and functions with reliance on the co-text and context of use (1962: 25; 28-30). Goodman (1968) compares "literal" and metaphorical meanings, and denies the opposition between metaphor and truth by showing examples of metaphorically true sentences, e.g. "a sad picture" (Goodman 1968: 70). Rosch (1973; 1978) and Clark (1976) note the importance of perceptual and interactional patterns in the creation of lexical categories. CMT can also be affiliated to Lehrer's (1978) notion of "root" metaphors giving rise to novel productions of these metaphors, and to Reddy's (1993) "conduit" metaphor which is linked to human thoughts, feelings, and experiences allowing the meaning of words to be extended in communication: for example, instances such as "Whenever you have a good *idea,* practice *capturing it to word*" and "You have to *put* each *concept into words* very carefully" rely on the conceptualisation of WORDS AS CONTAINERS (Reddy 1993: 167).

Lakoff and Johnson (2002) describe conceptual metaphors in terms of conceptual associations of domains, i.e. categories of the different aspects of a concept (Lakoff & Turner 1989: 38-9), producing metaphors that are derived from these associations. For example, "The number of books printed each year keeps going *up*" relies on the conceptual metaphor MORE IS UP, which associates increasing amount of books with height (2002: 15-6). According to this view, the link that can be drawn between different

metaphorical expressions (i.e., produced in texts, italicised here) shows that the association between two domains of experience (Lakoff & Turner 1989: 38; 26) is entrenched in the human mind, which explains the automaticity of metaphorical use (Lakoff & Johnson 2002: 3). This "mapping" (Lakoff 1993: 203) involves the association of an abstract target domain (e.g., increasing number of books) and a more concrete source domain (discussed in capital letters, e.g., height; 1993: 205; 207) that allows metaphor users to share their experience.

One conceptual metaphor can influence the reliance on another conceptual metaphor: this is described by the notion of "entailment" (2002: 87-96), e.g. AN ARGUMENT IS A JOURNEY; A JOURNEY DEFINES A PATH; therefore, AN ARGUMENT DEFINES A PATH (2002: 91). Grady (1997) establishes connections between different metaphors and provides a hierarchy with complex metaphors (e.g., THEORIES ARE BUILDINGS) which result from several primary metaphors (e.g., PERSISTING IS REMAINING ERECT).

Some domains seem to be regularly associated: this can be explained by the constraints imposed on the mappings. Firstly, to follow a certain logic, the mapping respects the "image schemas" involved in conceptualisation: the knowledge structure of the source domain fits the description of the metaphor user's experience. This knowledge structure is perceived during sensorimotor activities like the manipulation of objects (Gibbs 1998: 113; Kövecses 2010: 43; Lakoff & Turner 1989: 99). Secondly, the mapping relies on an "Idealised Cognitive Model" which means that the two domains have to be cross-referred according to universal or cultural knowledge (Gibbs 1994: 58; Kövecses 2010: 176). Thirdly, the "Invariance Principle" binds the two domains by preserving the structures of the source and the target (Lakoff 1993: 215). It is observed that the "constraints on fixed correspondences" (1993: 215) between the source and the target, established by the "Invariance Principle", can be transgressed. For instance, the metaphor users can exaggerate the structure of the source or the target or rely on absurd mappings to fulfil sceptical arguments. For example, the metaphorical concept "carbon footprint" can be exaggerated to present a caricature of polluters described through the metaphor *Carbon Bigfoot* (Koteyko, Thelwall, & Nerlich 2009: 43).

However, linguists have pointed out that CMT misses influential factors when dealing with metaphorical use. For example, Kövecses (2005; 2010) introduces a focus on the metaphor user's cultural background in the theory. He notes that while American metaphor users conceptualise HAPPINESS AS BEING OFF THE GROUND, Chinese metaphor users conceptualise HAPPINESS AS FLOWERS IN THE HEART (2005: 70-1).

Fauconnier (2003) and Fauconnier and Turner (2008) elaborate the process of mapping in their "Conceptual Integration Theory" or "Blending Theory". According to them, the mappings take place in three main mental spaces divided between the two input spaces that establish the properties of each concept (2003: 153) and the blended space that establishes the coherent properties coming from both inputs (2003: 150; 184; 2008: 42). It provides an emergent structure that is realised following the principle of composition (new relations are made available), or completion (knowledge, cognition and culture complete the structure), or elaboration (the structure is elaborated by relying on cognitive logic; 2003: 150-1; 2008: 47). For example, in the sentence "If Clinton were the *Titanic*, the iceberg would sink" (2008: 221), the metaphor user refers to Clinton's sexual scandals and to the way he "survived" the rumours. One input space establishes the properties of the *Titanic*, the other input space establishes the properties of Clinton. The cross-space mapping involves Clinton as the counterpart of the *Titanic*, and the scandal as the counterpart of the iceberg. In the blended space, Clinton is the *Titanic*, and the scandal is the iceberg. The "Blending Theory" helps to understand the hyperbolic statement: the Clinton-*Titanic* is unsinkable (2008: 221-222).

Steen (2008; 2011a) adds another "theory-model" to the production of metaphors. In his view, the comparison of linguistic expressions and conceptual metaphors is not sufficient to explain the reason why the metaphor is produced. CMT describes the ubiquity of metaphors but does not tackle the question of the metaphor user's consciousness (2011a: 37; 50). Steen introduces the "communication model" which takes place at the level of discourse (2008: 221; 227; 2011a: 27; 49). It takes into account the metaphor user's intentions and the metaphor recipient's understanding through the notion of deliberateness (see section 2.4.5.).

This approach can be related to Black's (1993) view which defines metaphor not only in terms of production but also in terms of metaphor recipients' understanding (1993: 24). In the interaction view (Black 1993), a metaphor is considered meaningful, or "apt" (1993:22), when it is realised in discourse (1993: 21-3) which enables the metaphor recipient to choose the correct interpretation (1993:25). This correct interpretation is processed by selecting, organising, and projecting the metaphorical properties (1993:28-9; see below). Metaphors can also be "resonant" (1993:26) when they involve a large set of implications that reflect the metaphor user's intentions and that cannot be realised literally (1993:26-31).

Kittay (1987) highlights the importance of the context which establishes the metaphorical nature of the statement by relying on semantic incongruity (1987: 23-4; 59-60). The cognitive force of metaphorical use is discussed in terms of features (1987: 37-8; see section 2.4.3.) emerging from participants' default assumptions (1987: 56). These features are related to each other (1987: 63; 241-5) and give the metaphor a new meaning in the context (1987: 91; 101). Kittay explains this process in terms of "sense extension" (1987: 207) which is permitted by the consideration of the semantic fields to which the expressions belong (1987: 227; 269).

CMT has a significant role in our study because it accounts for a "conceptual" link between different metaphorical instances. To highlight the different points of view expressed through metaphors in our corpus, the domains that are mapped need to be identified because they can make the reliance on preceding discourses more explicit (e.g., similar source domains) and they can establish how the mappings differ. However, our focus is on the reliance on metaphors emerging from preceding discourses: the origin of metaphors is not found in the metaphor user's conceptual system but in scientific observations and findings. The conceptual nature of the metaphors we investigate here can be questionable since the metaphors appear in (specialist) discourses about a highly complex topic that is publicly debated. Hence, the metaphors are likely to have a particular function and are not simply "automatic".

Some linguists look for indications of this cognitive process. They highlight the need to take into account the context (see section 2.4.). Indeed, the most questionable side of early cognitive studies is its initial reliance on invented examples which raises doubts

about the automaticity and even the existence of conceptual metaphors. Some corpus studies show that such metaphors do not often occur in discourse (Deignan 2005: 14; 102; 108-9). Other studies find textual evidence of conceptual metaphors by considering the exploitation of the source domain involved in the mapping (Musolff 2016a: 36-7). Another problem appears in the cognitive approaches previously mentioned: the projection of common properties ("Blending Theory") is not discussed in detail. Fauconnier (2003) and Fauconnier and Turner (2008) leave unexplained the process allowing some properties to be projected while others are downplayed and remain in the "generic space" (Fauconnier 2003:152; Fauconnier & Turner 2008: 47). The unconscious production of metaphors can also be questioned because the figurative meaning remains more or less ambiguous for the metaphor recipient while metaphorical "paraphrases" might make it more accessible. Hence, the metaphor user partly hides the meaning: for example, when a metaphor user describes Britain as "the *heart* of Europe", he/she may conceptualise the HEART as SICK or HEALTHY, and the recipient may not decode the appropriate metaphorical meaning if the characteristics attributed to the HEART are not foregrounded in context (Musolff 2004a: 85-113). The metaphor recipient's identification process is also not discussed in these studies (except in Kittay 1987; Black 1993; and Steen 2008).

2.3. The Pragmatic Approach

The results of psycholinguistic and pragmatic experiments on metaphorical inference and decoding are relevant to our study. While the cognitive approach mainly focuses on the production of metaphors, pragmatic views take into account the reception of metaphors and the cooperative processes between metaphor users and metaphor recipients. Metaphors in public communication may present additional features that favour a certain interpretation which can be partly explained by the mechanism of meaning construction. For instance, one of the widely discussed questions is the reliance on literal meaning. Metaphor is sometimes considered as derivative from literal language, which is considered the language of truth (see Kittay 1987: 7; 77; Leezenberg 2001: 127; Knowles & Moon 2006: 7). This is based on the idea that a metaphor understood literally would be meaningless and would be interpreted as a "wrong" statement. Once a statement is

interpreted as wrong, the metaphor recipient would look for "implicit" meaning and categorise the statement as figurative enabling understanding (Gibbs 1994: 83).

This view has been adjusted by considering the role played by similes in understanding (e.g., "A is like B"; Glucksberg 2001: 46; see below). However, when trying to transform a metaphor into a literal statement, the impossibility of finding an accurate paraphrase (Cacciari 1998: 138; Leezenberg 2001: 49; Deignan 2005: 17) raises new questions about the opposition between "literal" and "metaphorical" meanings. The "illocutionary force" of metaphor lies on a certain assertiveness arising from the information that a metaphor brings to the context of use (Searle 1993: 85-6).

The meaning can be accurately decoded when the context leaves no ambiguity as to which information is transferred (Glucksberg 2001: 17). For example, in an experiment involving participants reading texts, Ortony et al. (1978) establish that metaphorical sentences were understood faster when they were preceded by a longer contextual passage than when the contextual passage was shorter.

The gap between "metaphorical" and "literal" meanings does not hold for conventional metaphors which are so systematic that they can be considered literal (Goatly 2007: 33). The mental processes at play when decoding a literal sentence might be identical to those at play when decoding a metaphor (Kittay 1987: 38-9; Gibbs 1994: 75; Goatly 1997: 14; Leezenberg 2001:2).

Pragmatic and psycholinguistic approaches also establish constraints on the production and the reception of metaphors (Gibbs 1994: 239). Two main views present two opposite processes, called the "C/C Debate" (Barnden 2016): the comparison view (Gentner & Bowdle 2008) and the class-inclusion view (Glucksberg & Keysar 1993; Glucksberg 2001; 2008). According to Gentner and Bowdle (2008), the metaphor recipient first relies on the literal meaning (2008: 112) and undergoes an analogical process in the form of a metaphorical simile to understand a metaphor (2008: 110). Concurrently, the "class-inclusion" view focuses on the set of common properties shared by the two domains that allows the target to fit the category of the source, which becomes an ad hoc "superordinate" category (Glucksberg & Keysar 1993: 401), in the context of use (Glucksberg & Keysar 1993: 411; 422; Glucksberg 2001: 37; 41-43; 2008: 73; 79). These two views can respectively explain the mental processes involved in the

understanding of novel and conventional metaphors. If the abstraction of the source is already acknowledged, the metaphor recipient might not need a comparison to decode the meaning but if the metaphor is novel, the common properties are not already established and the class-inclusion cannot take place (Gentner & Bowdle 2008: 117). In the class-inclusion view, the literal meaning is not induced which allows the metaphor user to realise a metaphorical assertion with strong illocutionary meaning (Glucksberg & Keysar 1993: 403; 416). This illocutionary function is possible with reference to the prototypical properties of the domains, these properties need to be already established in the metaphor recipient's mind to understand the meaning (Glucksberg & Keysar 1993: 416).

The "class-inclusion theory" has been elaborated in the "Relevance Theory" (Wilson & Sperber 1994; Sperber & Wilson 2008): the use of metaphors may be more "relevant" than literal language depending on the context (Sperber & Wilson 2008: 86-7). The context can display enough information for the participants so that the processes of inferring and decoding take place automatically. In these conditions, relying on literal language would seem redundant because the properties of the domains are already accessible and do not need to be explicitly mentioned (Wilson & Sperber 1994: 86; 99-100; Sperber & Wilson 2008: 88). The selection of contextual properties allows for a category-extension of meaning (Sperber & Wilson 2008: 91; 94) which makes the "implicit" information (economically conveyed by the metaphor user) understandable for the metaphor recipient (Wilson & Sperber 1994: 92; 99-100).

Carston (2010) studies the importance of "implicit" meaning (2010: 156). In her view, each transfer of properties taking place during metaphorical production is specific to the context of use. In a different context, the relevant properties would differ (2010: 158). The two domains but also the contextual information undergo a process of adjustment (2010: 158; Kittay 1987: 180) that produces an ad hoc concept deprived of irrelevant properties (i.e., the "decompositional view", 2010: 165; 170).

Tendahl & Gibbs (2008) establish that Relevance Theory and CMT can supplement each other. CMT focuses on conventional uses, experiential basis, conceptual mappings, and classes of individual metaphors while Relevance Theory gives more importance to novel metaphors, participants' expectations, context, and communication (2008: 1834-6; 1839-40). Therefore, the questions that arise from one theory can be

(partly) answered by the other and vice versa. This theoretical background is relevant to our research because it highlights different factors according to which the context of use can influence the production and understanding of metaphors.

Despite the pragmatic findings, more explanations about the projection and selection of properties are needed. Establishing the common properties of the two domains is not sufficient to understand the meaning of the metaphor. Relevance Theory focuses on the role played by the contextual information available to the metaphor user and the metaphor recipient, but the illocutionary function of the metaphor is downplayed. According to Relevance Theory, metaphor is an economic linguistic device. Hence, the variation in meaning that takes place in different contexts is not analysed in detail. This variation may have different outcomes if the contexts of use present different factors that influence metaphorical production and understanding.

2.4. Context Dependency

2.4.1. Link between the context and the production of "good" metaphor

The cognitive and pragmatic views assume that the production of metaphor is automatic. Despite the constraints cited above, the role of the context in the realisation of figurative language needs to be investigated. Cacciari (1998) studies this aspect in terms of word meaning arguing that metaphors are used to name inexpressible concepts through existing words that translate the metaphor user's perception. In other words, the claim is that "the word is not at all the support of a concept… but is only a seal put over an unstable bundle of representations" (Musil 1906 quoted after Cacciari 1998: 128). According to this view, metaphor production is a matter of subjective perception and everyday experiences favour conceptual associations.

However, a metaphor does not simply involve a mental comparison or a mental transfer from one domain to another, it is an assertion – one domain is another domain – that involves new knowledge and insight (Black 1993: 31; 35; Searle 1993: 87; 92). These new knowledge and insight can be decoded with reference to the metaphor user's

communicative goals (Fraser 1993: 329-331). The knowledge of the context and of the participants' culture (Steen 1994: 19-20; Sticht 1993: 624; Leezenberg 2001: 25; Deignan 2005: 16; 22) helps to produce a "good" metaphor (i.e., communicatively successful; Steen 1994: 171-9; Cacciari 1998: 138). Nevertheless, the "implicit" information may not always be readily available in context or culture and the remaining ambiguity sometimes plays an important role. In such conditions, the metaphorical meaning can only be understood with a close analysis of the context.

2.4.2. Role of the context in the interpretation

To highlight the role played by the context in the understanding of metaphors, Steen et al. (2010) distinguish the "basic meaning" of a metaphorical expression from its "contextual meaning" (2010:37). This distinction is relevant since the interrelation of domains (Lakoff 1993: 205; 207) occurs at the conceptual level whilst the distinction between "vehicle" and "tenor/topic" (Richard 1936) occurs at the linguistic level. The latter terms describe the metaphor as it appears in texts: the "vehicle" establishes the meaning of the word within the source domain and the "topic" establishes the meaning of this word within the target domain, from which the metaphorical meaning results (Deignan 2005:14). According to Steen et al. (2010), the context adds new information that is not accessible when the word is isolated (e.g., in dictionaries). This claim has been documented with reference to conceptual properties: a context brings to mind new properties that are too specific to be part of the prototypical properties but that are at play in relevant situations: for example, a carbon *footprint* can be described with reference to the entity who left the *footprint* (a human footprint, an animal footprint, a fictive character's footprint, Koteyko, Thelwall, & Nerlich 2009:43). When the concept is frequently (or conventionally) found in a specific context, there will be no effect on its meaning but when the concept is used in an unexpected way, its meaning will be adapted to fit the context (Kintsch 2008: 132). Consequently, some contexts favour the use of certain source domains. This process is called "topic-triggering" (Semino 2008: 27; 104-5). "Topic-triggering" can be noticed through the use of conventional metaphors: "an aspect of the topic under discussion inspires the choice of the metaphorical source domain

that is evoked via the metaphorical expressions used in the text" (Semino 2008: 27). For example, *The Guardian* referred to the conflict between South Africa and Morocco over control of Western Sahara as a "Diplomatic *desert*", where *desert* applies to both the lack of diplomatic relationships and to the literal desert of Sahara (Semino 2008: 27). This process can also be noticed through novel metaphors when the context needs some specifications that the metaphor recipient might not understand without figurative language (i.e., in the case of abstract to concrete transfer; Leezenberg 2001: 51).

To choose the adequate metaphor, the metaphor user needs to adapt it to his/her communicative goals (Kittay 1987: 14; Searle 1993; 94; Leezenberg 2001: 131; 201; Charteris-Black 2004: 13; 30; Semino 2008: 71). He/She also needs to take into account the register (Cacciari 1998: 119), and the age, knowledge, background of the metaphor recipient (Cacciari 1998: 119; Sticht 1993: 24; Williams Camus 2015: 250) and adapt the metaphorical expression to the specific circumstances of discourse (Leezenberg 2001: 152; Charteris-Black 2014: 23; 86-91).

Stern (1985; see also Leezenberg 2001) explains further influential factors: he notes that the context allows the metaphor user to use a specific metaphorical source according to contextual "presuppositions". These "presuppositions" help to focus on certain metaphorical properties and identify the inconsistent properties, thereby helping the metaphor recipient to select the relevant properties (Stern 1985: 682; Leezenberg 2001: 189-190). These properties are presented as fitting the target domain: the metaphor user appears to realise a "true" statement according to the contextual parameters while delivering a figurative message (Stern 1985: 694-5; Leezenberg 2001: 197; see also Kittay 1987: 75).

However, according to Leezenberg (2001), Stern's "presuppositions" do not satisfactorily explain how properties are filtered in the context and how the metaphor recipient's understanding is influenced by the choice of a specific source (Leezenberg 2001: 204-5). Stern (1985) divides the "presuppositions" into two sets: the first set generates the sets of properties and the second acts as a filter to exclude the irrelevant properties (1985: 698). Leezenberg (2001) notes that a semantic explanation of how this division of properties occurs is lacking. He focuses on semantic relations to interpret metaphorical meaning, e.g. anaphoric relations (2001: 233-4), instead of pragmatic

relations (2001: 206). The interpretation of metaphors is based on a change of "presuppositions" with the help of contextual information to identify what is asserted by the metaphor user (Leezenberg 2001: 220-1).

These different approaches to interpretation emphasise the necessity to establish a method that allows the analyst to justify a particular understanding (with contextual information), e.g. the consideration of the plurality of possible meanings that are more or less salient for the metaphor recipient depending on the context of use.

2.4.3. Features/Grounding

A metaphor links two domains together because the target and the source share common features in a specific situation. The situation makes some features of the source more salient while they may be unnoticed when the source concept is observed in an unspecific context: for example, a mother may not be qualified as a strict parent while the phrase *Mother Nature* in climate change discourse can emphasise the STRICT behaviour of the metaphorical MOTHER (Augé 2019a; see Chapter 4). To convey the "correct" meaning, the metaphor user highlights the features that best translate his/her communicative goals and hides the ones that do not fit with his/her message (Lakoff & Johnson 2002; Charteris-Black 2004: 133; Koller 2004: 4; Goatly 2007: 30). The connection between the features of the domains at play in the context of use is called "the ground" (Lakoff & Turner 1989: 59; Gibbs 1994: 113; Steen 1994: 130; Knowles & Moon 2006: 9; Goatly 2007: 11; Musolff 2016a: 33): for example, the "authority" of Nature over environmental resources and climate can map with the authority of a mother (Augé 2019a). The interrelation of features (see Chapter 3) delivers a new meaning (ad hoc concept) conveyed to the metaphor recipient: for example, a personified Nature behaving like a STRICT MOTHER (Augé 2019a). When describing metaphors as a matter of selection of features, the opposition between literal and figurative meanings disappears: the metaphor makes unnoticed features of the source and the target perceptible in the context (Giora 2008: 147).

In communication, the features of the source must refer to universal knowledge to be understood: if these features are too specific or rely on specialist knowledge, the

ground of the metaphor would not be understood, and the communication would fail. Features must be identified in context and their link with the source must be taken for granted, even if they originate in folk theories that are sometimes proven to be wrong (Kittay 1987: 238; Steen 1994: 41; Leezenberg 2001: 74; Musolff 2006: 27; 2016a: 8; 25).

Features also help the distinction between conventional and novel metaphors (Gibbs 1994: 123; Steen 1994: 33-41; 204; Charteris-Black 2004: 12-22; Goatly 2007: 28; Musolff 2016a: 40; 52): when the features are highly related to universal knowledge and when the mapping takes place in a situation that exhibits common features between the domains, the metaphor can be considered conventional (because these common features favour the choice of a specific source); when the situation does not exhibit many common features, the metaphor can be considered novel (either because the context of use is too specific or because the common features are not inherently salient). This distinction has been studied by Lakoff & Turner (1989): novel metaphors (such as the ones found in poetry) are rooted in conventional metaphors (1989: 26), their creative nature is explained by the reliance on features that are not usually foregrounded when the mapping of the two domains takes place (1989: 50; see also Koller 2004: 175; Knowles & Moon 2006: 5): for example, when describing European Nations as a FAMILY, metaphor users may refer to DIVORCED PARENTS, ORPHANS, or GODPARENTS (Musolff 2004a: 15-29). Alternatively, lexicalised metaphors are conventional because the mapping is so common that the target is defined according to the source (Kittay 1987: 121; Sweetser 1990: 8; Searle 1993: 98; Knowles & Moon 2006: 6; 64): for example, *greenhouse gases* is a conventional metaphor which describes the gases responsible for the warming of the atmosphere (Nerlich & Hellsten 2014).

In this study, the term "feature" is understood in relation to the context of production which is expected to display a plurality of metaphorical features depending on the meaning the metaphor user intends to convey. This definition thus differs from the one adopted in relation to the "Invariance Principle" (Lakoff 1993: 204; Eubanks 1999: 421) discussed in section 2.2. It also differs from existing approaches on metaphor that attribute features only to the source or to the target domain (only the features of the source or the target domain would be at play during the interpretation, Becker 1997: 243-4; Gineste, Indurkhya & Scart 2000: 122; Utsumi 2005: 162). Some studies refer to "shared"

or "common" features: the meaning of the metaphor is derived from both the target and the source domains (Becker 1997: 244; Gineste, Indurkhya & Scart 2000: 119). Contrastively, the features at play in the interpretation are sometimes called "emergent" features because they only occur when the source and the target domains are mapped but do not exist independently of this mapping (Becker 1997: 244; Gineste, Indurkhya & Scart 2000: 128; Utsumi 2005: 152).

In our research, the term is not limited to these definitions. Rather, the context of production, the understanding of the topic as well as the intentions of the metaphor users are of particular interest: the features at play in the interpretation of the metaphor (coming from the source only, the target only, both domains, or the association of domains) are expected to differ from one metaphorical instance to another, which constitutes the hypothesis of our research that aims at explaining the variation in meaning (more details about features in Coulson & Matlock 2001: 306-308 and Moon 2004).

We take the position that the link between features of the source and target is implicitly conveyed and the manifestation of unexpected features can change the metaphor recipient's perspective on the target. The metaphor user relies on this change of perspective to fulfil different communicative goals.

2.4.4. Functions of Metaphors

In specific situations, the metaphor user needs the metaphor recipient to perceive the target domain in a way that respects his/her experiential or subjective interpretation. The metaphor can fulfil this need by selecting features that are coherent with the message conveyed. The metaphor fulfils a paradoxical role: on the one hand, it helps shaping the target according to contextual needs, and on the other hand, it relies on ambiguous meaning. This ambiguity is sometimes intentionally left as such (Fløttum 2013: 3). Letting the metaphor recipients choose the appropriate features can make the statement more powerful because, despite the subjectivity underlying the mapping, the discovery of common features appears self-evident. A subjective statement can transform into a seemingly objective observation.

A metaphor can serve as a means of persuasion (Charteris-Black 2004: 10; 2014: 174; Goatly 2007; Cserep 2014: 5), especially in contexts where the metaphor user has to defend his/her point of view (e.g., political contexts, Lakoff 2004; Musolff 2004a; 2006; 2016a; Charteris-Black 2006; 2011; 2014; Ahrens 2009; Perrez & Reuchamps 2015; see below). For example, Thibodeau & Boroditsky (2011; 2013) conducted a survey asking participants to choose between a "reform" and an "enforcement" policies against crime. Their results show that participants who received a text with VIRUS-related metaphors (e.g., "crime is *a virus infecting* the city of Addison" 2011: 3) were prone to favour the reform policy while participants who received a text with BEAST-related metaphors (e.g., "crime is *a wild beast preying on* the city of Addison" 2011: 3) were prone to favour the enforcement policy. The linguists explain these findings by highlighting the power of metaphors on reasoning. However, these results are questionable because some details of the experiment are not mentioned (e.g., the figures associated with this experiment show that the majority of the VIRUS readers still preferred the enforcement solution, 2011:5), and the results of similar surveys performed by Steen, Reijnierse, and Burgers (2014) and Reijnierse, Burgers, Krennmayr, and Steen (2015) show that the metaphors did not play such an important role in participants' decisions.

The reliance on an "alien" concept (i.e., the source domain) helps to trigger attention: the attention is not only directed towards unnoticed features of the target domain but also towards the content of the text because of the unexpected presence of an "alien" concept (Steen et al. 2010: 11). This function explains the occurrence of metaphors in newspaper headlines (Kittay 1987: 67; 79; Goalty 1997: 301; Steen et al. 2010: 43-5) because they raise readers' interest in the main content of the articles.

Metaphors are also used to name a new concept: the source domain is selected because its prototypical features match observable features of the target in a specific situation. The target domain is described through the features it shares with the source and can even be given the name of the source when the metaphor is conventionalised, it thus fills a lexical gap (Black 1993: 25; Cohen 1993: 60; Paivio & Walsh 1993: 309; Goalty 1997: 27; 149; 2007: 12). Boyd (1993) takes the example of catachresis (lexical gap; 1993: 481) in scientific theories: in making new discoveries, scientists adapt the linguistic categories so that the language corresponds to real world experiences. To name the discovered element, they rely on an analogical process that describes their experience

of the discovery in terms of an existing element (e.g., the *greenhouse* effect, Nerlich & Hellsten 2014). Boyd calls this process the "accommodation" of language (1993: 483) which can also serve an explanatory function – the metaphors are theory-constitutive (1993: 495). By relying on the acknowledged features of a source domain, metaphors can explain an unfamiliar or recently discovered concept (Kittay 1987: 4; Boyd 1993: 28; Steen 1994: 112; 192; Gibbs 1998: 112; Musolff 2016a: 91; Damele 2016: 80-1). For example, Deignan (2005) notes the use of the conceptual metaphor CONNECTED COMPUTERS ARE NODES IN A WEB to understand computer processing through expressions such as "(worldwide) web" and "(inter)net" (2005: 16).

The description/ identification of the target domain according to features can lead to the production of a metonymy: in such cases, the mapping only involves one domain and the target is distinguished by one of its prototypical features (Kittay 1987: 296-7; Lakoff & Turner 1989: 185; Glucksberg 2001: 7; Goatly 2007: 15; Kövecses 2010: 184-188). For example, *green* can refer to the typical colour of the environment, giving rise to the metonymy GREEN FOR THE ENVIRONMENT (Romaine 1996), in occurrences such as "*green* policies".

In our study, we show that an explanatory metaphor can be recontextualised with a persuasive function.

2.4.5. Deliberate Metaphors

Steen's communication model (2008) is relevant to the analysis of metaphorical meaning when a text is produced in public discourse or directed towards specific metaphor recipients, especially when it deals with a disputed issue such as climate change. Questioning the cognitive approach which sees metaphor as automatic, Steen (2011b; 2014; 2016; see also Reijnierse, Burgers, Krennmayr & Steen 2018a and 2018b) discusses the metaphor user's consciousness. He distinguishes three types of metaphors:

- Direct metaphors involve a source and target domains which are explicitly mapped with words such as "compare" or "like" (2014: 185), as in "They (G8 leaders) are *like* medieval preachers" (Atanasova & Koteyko 2017a: 460)

- Indirect metaphors occur in contexts where the contextual meaning is privileged over the basic meaning (2014: 186-7), as in "This should not be a *fight* between the rich and the poor world, or between east and west*"* (Atanasova & Koteyko 2017a: 459)

- Implicit metaphors occur when the metaphorical concept is referred in an ellipsis, as in "For three reasons such *a move* would be welcomed. First *it* [move, M] would bring Britain into line with the best European practice […]" (Steen 2011a: 51)

In Steen's view, "direct metaphors" are deliberate because they involve a term which highlights the figurative meaning of the statement (2014:185), "indirect metaphors" are deliberate when they aim at changing the metaphor recipient's perspective on a topic (2016: 125), and "implicit metaphors" are often deliberate because they rely on cultural, conventional knowledge that sometimes allows metaphorical revitalisation, i.e. the creative use of conventional metaphors (Semino 2008:20; Steen 2011a: 51; 56-7). Williams Camus (2015: 255-7) discusses a relevant example of "revitalisation" in the media: she notes that while scientific texts use personifications to describe genes (e.g., "the gene is the *guardian* of the genome" 2015:257), journalists have depicted genes as *James Bond's evil adversary* (2015: 255-7). In the cases of indirect and implicit metaphors, the use is defined as deliberate when the metaphor user establishes that a metaphor is more apt than any other linguistic device to change the metaphor recipient's perspective (Steen 2011b: 55; 2014; 2016: 116).

Gibbs (2011) contradicts this view: he states that the metaphor recipient may not be influenced by a deliberate metaphor because he/she may not recognise the metaphor as such and may not perceive new insights into the topic discussed (2011: 31). Additionally, the metaphor user may not be aware of his/her own metaphorical production (2011: 28). Evolutionary force (bodily, cultural, cognitive, linguistic factors), long-term conceptual knowledge, and experiential history are cited as potential factors that can influence metaphorical use and understanding (2011: 46). However, none of these factors nor the surrounding language (e.g., a "direct metaphor" may be interpreted as a simile) indicates deliberateness (2011: 48).

The questions raised by these studies indicate the crucial role of features selection in the interpretation of a metaphor. However, the features selection may vary depending on a larger range of factors: the metaphor user may use metaphors to fit his/her

commitment (e.g., time and length limitation for publications), and he/she may lack scientific knowledge to fully understand a scientific metaphorical concept. Hence, the metaphor user may deliberately use a metaphor for different reasons, unrestricted to the aim to persuade the metaphor recipient.

2.5. Varying metaphorical understandings: corpus analysis, narratives and scenarios

2.5.1. Variation in meaning depending on individual production and reception

The meaning of a metaphor depends on various individual factors. A well-documented variation is related to the metaphor user's culture: in a corpus study involving texts written in different countries (where English is the national or secondary language), Mueller (2016) finds that when relying on the TIME IS MONEY metaphor (Lakoff & Johnson 2002: 7-9), metaphor users focus on different features depending on their cultural background. For example, metaphor users from India and East Africa favour the use of "WASTE + time" expressions while the productions of "SPEND" and "SAVE + time" expressions show a lower frequency. On the other hand, texts produced in Singapore show an opposite tendency (2016: 90-100). In another survey involving students from different countries, Musolff (2016a:116-29; 2016b) focuses on metaphor recipient's culture and shows that the metaphorical expression *body politic*, which is pervasive in English, can give rise to various interpretations. Most of Chinese students' responses focus on geographical features (geographical shape related to anatomy or geographical places metonymically related to political institutions, 2016a: 119; 2016b: 207) whereas most European, US, and Israeli students' responses focus on a functional whole (2016a: 123-4; 2016b:212). These variations can also occur because of the metaphor recipient's age and because of his/her different experiences: Winner & Gardner's (1993) survey shows that older children can perceive some similarities that younger children ignore because they lack experience associated with the source domain (1993: 432-3).

In the case of climate change metaphors, such variations can also be explained by differences in knowledge (Sticht 1993: 624; Leezenberg 2001: 25; Charteris-Black 2004:

37). When scientists produce a metaphor, they rely on features that are relevant to them but not to the readership who gets an approximate understanding because they focus on other features. For example, while using the metaphorical expression *greenhouse effect*, scientists may rely on the "man-made" feature that is common to the concepts of "greenhouse" and (anthropogenic) climate change. However, instances of *man-made greenhouse effect* have been observed in our corpus. The manifestation of a significant feature (*man-made*) already included in the meaning of *greenhouse* (i.e., a greenhouse is usually manufactured by humans) shows that the metaphor users, in this context, give importance to this specific feature.

These findings question the existence of an "accurate" understanding of scientific metaphors (Deignan, Semino & Paul 2019: 394). The studies mentioned above all show that the metaphor users and recipients select the metaphorical features that are the most relevant to them. They may do it wittingly when their opinion differs from the metaphor user's or unwittingly when their culture, linguistic traditions, or beliefs favour a different interpretation. Analysing metaphors in discourse implies a risk of over-interpretation (Svensson & Stenvol 2013; Charteris-Black 2014: 148; 170; Musolff 2016a: 3) because linguists may give importance to metaphorical features that are relevant to their analysis but that may not be significant in the original production or for other metaphor recipients.

2.5.2. Corpus analysis and context-dependent meaning

To combat issues of interpretative subjectivity, linguists analyse corpora which allow them to test preceding views that define specific metaphors as conceptual or that identify a particular pattern of metaphorical understanding (e.g., Deignan 2005; Semino 2008). They sometimes seek to challenge existing intuition-based generalisations (e.g., Lakoff & Johnson 2002) by invoking attested occurrences.

For example, Holmgreen's analysis (2008) challenges Lakoff and Johnson's view on metaphors which does not investigate the role of the context in metaphorical production and interpretation. She analyses the use of metaphors in Danish newspapers about biotechnology: she identifies two types of metaphors – the *Frankensteinian* and the *Faustian* metaphors – that are applied in articles to criticise biotechnology, more precisely

Genetically Modified Organisms (GMOs). Nerlich's study (2010) shows that a metaphorical mapping (as established by Lakoff 1993) can fulfil specific functions in context. She focuses on a particular problem, the scandal of "Climategate" (see section 2.6.2.), and studies how the CLIMATE CHANGE AS A RELIGION metaphor contributes to scepticism.

Corpus analysis can be used to track the use of the same metaphor across discourses. Nerlich (2003) studies how the metaphorical expression *silent spring* in environmental discourse is related to its original coinage from Carson's book *Silent Spring* (Carson 1962/2000 quoted after Nerlich 2003: 115). She finds that both broadsheets and science journals use the metaphor as a popular reference for its illocutionary force and emotive power, and as a scientific reference (quoting the title of Carson's book) when dealing with the impact of pesticides and GMOs on the environment and on human health (2003:125). This approach establishes a useful methodology for our study because it shows that genres and co-texts have an influence on the interpretation of metaphors. Nerlich (2003) also shows that the meaning that is originally conveyed (as part of Carson's scientific theory) may not be conveyed in following discourses relying on the same metaphor.

2.5.3. Frame, Narrative, and Perspective

The notion of "frame" can be defined at several levels: according to Fillmore's definition, frames are coherent scene-like structures of conceptual elements and relations (Fillmore 2006: 377-79). In the case of corpus analysis, this definition is adjusted with mentions of textual/verbal evidence that structures the discourse according to a specific point of view. This approach has been elaborated by Greco Morasso (2012) who identifies "contextual frames" in her study of media argumentation. A "contextual frame" is defined as a selection and presentation of facts which rely on the reader's contextual knowledge to construct the news as part of the journalist's or the newspaper's "strategic manoeuvring" (2012: 198-200). Foust & Murphy (2009) emphasise the persuasive and ideological functions of framing (2009: 153) that emerge from the structured relations between concepts (e.g., the depiction of climate change through expressions related to economy;

see Shaw & Nerlich 2015: 35). Entman (1993) elaborates these structured relations between concepts and establishes a schema which highlights how frames define a problem, identify the causes, make moral judgements, and suggest remedies.

Some corpus linguists consider metaphor as a framing device. For example, Flusberg, Matlock & Thibodeau (2017) note that the WAR metaphorical frame in climate change discourse helps to communicate the risks and the emergency effectively whereas a discourse which is metaphorically framed in terms of a RACE is not as effective.

Metaphor narratives rely on the concept of "frame". The features of the metaphors can be ideologically oriented to present a particular picture of the topic. The association of these metaphors can reveal a semantic link which produce a narrative. For example, the conceptual metaphor BIODIVERSITY IS HERITAGE can give rise to two narratives in scientific communication in the media: NATURE IS A STORE OF RESOURCES and NATURE IS A COMPLEX WEB OF RELATIONS, which present different views on the characteristics attributed to biodiversity (Hellsten 2002: 52).

The narratives involve particular expectations regarding some aspects of the topic. Narratives help the metaphor user to paint an effective picture of the topic which fits his/ her own interpretation (Bamberg & Andrews 2004; Bamberg & Georgakopoulou 2008; Hoffmann 2010; Hanne, Crano & Mio 2014; Sinding 2017; Musolff 2019): for example, Nature can be perceived as a STORE or as a COMPLEX WEB (Hellsten 2002).

However, existing literature about narratives focuses on the research of semantic elements in a corpus which can be compared to the elements found in narratives, as a genre: narratives are identified within discourse units. They present elements that offer a view on events which are organised into a plot (Hanne 2014:13). These events follow a specific time-line involving different steps that construct the plot: the abstract (summarizes the events), the orientation (defines the setting), the evaluation and complicating action (the actual events of the story), the resolution and the coda (mark the end of the story, Labov 2006: 37; Jucker 2010: 71). In other words, narratives present a "storied world" in which characters have goals distinguished from other characters' goals enabling social evaluation such as "heroes versus villains" (Bamberg 2004: 357).

Narratives are rhetorical devices that guide the interpretation of discourse: the reader can self-identify or be affiliated to a social group represented by one aspect of the narrative following a shared culture or beliefs (Bamberg 2004: 367; Jones 2004: 171; Hoffman 2010: 7). Schubert (2010) establishes four functions of political narratives, namely, personalising (focus on the speaker), integrating (values of a nation or of a political party), exemplifying (individual action/utterance to support the speaker's intentions) and polarising (unwelcome actions of opponents/enemies; Schubert 2010: 147-151). These functions have been illustrated in Musolff's (2019) analysis of the use of "fact-based truth presumption" ("FBTP"; Musolff 2019: 3) in political discourse. These FBTP are accommodated to link the narrative to human experiences. They emphasise the recipients' reliability on the discourse and on the discourse producer (Musolff 2019: 3; 10; 15-6). To identify narratives (and their functions) within a discourse, linguists often rely on textual elements such as specific pronouns, verbs, tense, etc. (Hoffmann 2010: 5; Schubert 2010: 145; see also Bamberg & Georgakopoulou 2008: 385). These linguists aim at comparing different discourses with narratives, i.e., they look for elements that can also be found in narratives.

In our analysis, narratives are understood as a selection of conceptual metaphors (Hellsten 2002: 52). The studies aforementioned cannot be adapted to identify narratives in our corpus. Our focus is on how the source domains of the metaphors can be used by the metaphor users to "frame" the discussion about climate change (Hanne 2014: 1). We supplement the notion of narratives with an account on the metaphorical perspectives associated with these narratives. While narratives exploit the metaphorical source domains to reveal varying storylines, perspectives highlight the aspects of the target domain which different narratives metaphorically describe in the corpus. The identification of metaphorical perspectives is a necessary step when analysis metaphors depicting a complex topic like climate change. Indeed, this topic can be perceived through many different aspects like weather events, pollution, industrialisation, environmental policies, or scientific experiments and predictions. Hence, these perspective determine the concepts described by different narratives.

The notion of "narrative" is here understood as the ideal "root metaphor" (Hammack 2014: 53) or "extended metaphor" (Bougher 2014: 255). This "root/extended" metaphor leads to multiple uses of metaphors (as forms of "compressed narratives",

Bougher 2014: 255) and can reveal the occurrence of metaphor scenarios (Sinding 2014: 81). The analysis of these scenarios can, in turn, indicate the presence of "master" and "counter" narratives in the genres, depending on the metaphor users' perspective on climate change (Andrews 2004: 1-2; 5; Bamberg 2004: 352-3; 359-60; Musolff 2019: 9).

2.5.4. Metaphor scenarios

Variation in metaphorical meaning may be established by observing relevant collocations (e.g., *man-made greenhouse effect*) but also exploitation of the source domain (e.g., a CLEAN or DANGEROUS HOUSE). This variation helps to establish the metaphorical viewpoints adopted to describe climate change. Some corpus studies take into account this variation in meaning and explain this phenomenon in terms of flexibility of the source domain, common features shared between domains, and metaphor user's experiences (Hellsten 2002: 3; 49; Charteris-Black 2004: 85; Musolff 2004a: 121; 141; 2004b: 70; 2013: 140; Cameron & Deignan 2006: 683; Semino 2011: 9-10; 14; Semino, Deignan & Littlemore 2013: 42; 45).

Another factor may be responsible for the variation in meaning throughout the texts: the readership's appreciation of the metaphor. Indeed, metaphors can be used as attention-triggers (Koteyko, Thelwall & Nerlich 2009: 27) and their exploitation may correspond to the readership's expectations and beliefs (e.g., GREENHOUSE gases can be described as a BLANKET, Cameron 2003).

The variation in metaphorical meaning can also be related to historical background: the metaphor user can allude to preceding uses of the metaphor but adapt it to the context or to his/her own interpretation to the point that the original meaning becomes unnoticed or unacknowledged. The study of these reinterpretations involves a discourse historical approach which takes into account linguistic, social and historical factors shaping language use (see Musolff's example of the historical evolution of the NATION (STATE) AS A BODY metaphor, 2016a: 58-61; see below).

This approach to metaphor study can be related to Zinken's (2007) notion of "discourse metaphor": the conventionalisation of a novel metaphor is promoted by the

repeated use of a source domain that conveys a particular figurative meaning. Extended meanings are motivated by encyclopaedic knowledge conveyed by the source and the conventional interpretation of the source domain (2007: 6-7).

Hellsten (2002) studies scientific communication in the media and notices that the conceptual metaphor BIODIVERSITY IS HERITAGE has different meanings. These interpretations are established by different metaphorical narratives: NATURE IS A STORE OF RESOURCES and NATURE IS A COMPLEX WEB OF RELATIONS (2002:52). In her study, a narrative is defined as a selection of conceptual metaphors that highlights a more specific perspective on the topic (2002:52).

Musolff (2004a; 2004b; 2006; 2013; 2016a; 2016b) elaborates this point by introducing the concept of scenarios: scenarios involve assumptions about the source concept which become part of a metaphorical script (participant, storyline, outcome…). This script displays an evaluation on the aspects of the source concept (successful, unsuccessful, permissible, illegitimate…). These positively or negatively evaluated aspects are mapped onto the respective target concepts for argumentative purposes (Musolff 2006: 28; 2016a: 30-1). For example, in a corpus of metaphors used in the press coverage of European politics, "EUROMETA" (2016a:14), two conceptual domains have been identified, FAMILY (MEMBERS) and LOVE/MARRIAGE RELATIONSHIP. These two domains can be divided into three mini-narratives: PARENT-CHILD relationships (including SOLIDARITY and HIERARCHY-AUTHORITY), MARRIED LIFE of the EU *couple* (including MARRIAGE PROBLEMS from ADULTERY, SEPARATION, DIVORCE, to MARRIAGE OF CONVENIENCE and RENEWED NUPTIALS), LOVE/MARRIAGE relationships (and problems) between Britain and the European Union and its institutions. These three mini-narratives provide grounds for evaluative scenarios: 1) the EU *family* has an egalitarian structure (e.g., members states are depicted as *children with equal rights and mutual obligations*), 2) the EU *family* has a *hierarchical* structure (e.g., the Franco-German *couple* dominating the rest of the European Union with Britain as potential *lover*), 3) the EU as a homogeneous entity with which Britain is engaged in a bilateral but asymmetric love/marriage relationship or in its breakdown (personifications of the EU Commission, some countries and their politicians as the EU entity; 2016a: 31-3).

In our study, the variation in meaning is observed in different genres. We investigate the influence of genres on metaphorical interpretation to understand how a similar mapping can convey different meanings and how a derived metaphorical meaning can be identified in a specific genre. The particular metaphorical meaning observed in the occurrence of a particular metaphorical expression in text is referred to as a "scenario-version" because such an occurrence represents a specific way by which the source domain of the scenario can be exploited in context. For example, while discussing the scenario WARMING AS A BLANKET in Chapter 6, we can identify various scenario-versions which either describe a BLANKET WHICH PROVIDES ADJUSTED TEMPERATURES or a GRILLING BLANKET which threatens humanity.

Our research is thus performed through three main levels of analysis: the perspectives highlight the characteristics of climate change which are metaphorically described; these perspectives are composed of several narratives which respectively rely on different source domains to describe these characteristics of the topic; each narrative is formed out of different scenarios which reveal varying exploitation of a metaphorical source domain and these different exploitations are referred to as different versions of the scenario.

2.6. Metaphors and genres

2.6.1. Genre analyses

As demonstrated in Steen's (1994; Steen et al. 2010) and Sardinha's (2015) studies, the use of metaphors varies across genres. Sardinha (2015) explains this finding in terms of multiple interactions among metaphors and the different linguistic features associated with a genre (2015:18). These particular linguistic configurations highlight a distinction between metaphor-dense registers (e.g., academic prose and news) and metaphor-sparse registers (e.g., fiction and conversation; 2015: 35). Our study relies on the hypothesis that genres can influence the variation in the metaphorical meaning even though a similar mapping is at play. This assumption is based on existing research like Williams Camus' (2015) analysis of cancer metaphors in a corpus of English and Spanish newspaper

articles (*The Guardian* and *El Pais*, Williams Camus 2015: 246). It presents a comparison between scientific communication (through which scientists justify their activity and their funding) and journalists' communication with a focus on popularisation (they refer to scientific findings to legitimise their claims, 2015: 249-50). Overall, the identified metaphors show that journalists seek to avoid dealing with scientific details (e.g., the actions of proteins are attributed to genes via the use of personifications) and sometimes look for linguistic creativity (genes as *James Bond's evil adversary*, 2015: 255-7). The personification of molecules in newspapers echoes the scientists' metaphorical description which sees the movement of molecules as a migration (2015: 259). The linguist also notices a misunderstanding about the interaction between cells and body in newspapers. Journalists use the personification *cell death,* but this expression can give rise to confusion and conveys sensitive implications (2015: 262).

The use of metaphors in the media has often been investigated (see for example Trumbo 1996, Hellsten 2000, Thalhammer 2015, and Atanasova & Koteyko 2017a). The media act as a "filter" of information (Nerlich & Koteyko 2010: 38; Charteris-Black 2011: 32), it groups and summarizes a plurality of discourses about a particular topic and adapts these discourses to fulfil specific requirements. For example, Doyle (2007) explains the lack of journalistic attention to climate change by the "event-based tactic" of newspapers (2007: 133). As a result of this tactic, climate change issues seem unattractive insofar as they involve a long-term evolution (2007: 144). This particularity makes climate change communication an interesting topic of research because it involves reformulation and adaptation of discourses, or recontextualisation (Williams Camus 2015: 246). We can expect that these processes also apply to metaphors.

The reader's lack of knowledge about a topic and the journalistic subjectivity can appear as an issue because the reader learns about the topic only ever according to a certain perspective. In the case of climate change discussions in the media, this issue is sometimes depicted as the cause of scepticism (Nerlich 2010; see below) because newspapers have been established as the main source of information for "lay" people (Foust & Murphy 2009: 152; Schafer & Schlichting 2014: 143; Shaw & Nerlich 2015).

2.6.2. Climate Change Discourse

The topic of climate change involves different levels of discourse that are often interrelated. Scientific communication about this topic present documented observations so that actions can be taken to tackle the problem (Väliverronen & Hellsten 2002; Nerlich, Koteyko & Brown 2010: 105). Politicians refer to this communication to advertise their own perspectives (Lakoff 2010; Nerlich 2010; Shaw & Nerlich 2015), and journalists popularise the issue by reporting events related to climate change (Olausson 2009; Schafer & Schlichting 2014; Atanasova & Koteyko 2017a; Koteyko & Atanasova 2017). Non-Governmental Organisations, like *Friends of the Earth*, play an intermediate role between scientists and the media: their purpose is to share their scientific knowledge in a way that is supposed to attract media attention (Doyle 2007). However, the reliance on scientific findings can be questioned because it has been noted that politicians and journalists give more and more importance to their own opinions on the topic, discarding scientific warnings (Trumbo 1996: 272-3; 276; Nerlich, Koteyko & Brown 2010: 98).

The release of the IPCC (Intergovernmental Panel on Climate Change)[1] first assessment report in 1990, which identified humans as responsible for climate change, triggered attention to the problem and increased the need for explanation that relates this phenomenon to ongoing events (Koteyko, Thelwall & Nerlich 2009: 28-31; 39; Schafer & Schlichting 2014: 148-9).

The scandal of "Climategate" in 2009 (Nerlich 2010; Shaw & Nerlich 2015: 38) involved scientists' emails being hacked and made public. The consequences of this leak raised questions about scientific findings and objectivity: scientists were accused of being corrupted and of adapting their results so that they would fit editors' expectations (Nerlich 2010). This event spread scepticism and, consequently, the need for scientific transparency. Linguistically, this has been accompanied by an increase in the use of CLIMATE CHANGE AS A RELIGION metaphor which depicts science as "untrue" (Nerlich 2010). The use of this metaphor to promote sceptical arguments was already noticed in the British press as early as 2006 (Atanasova & Koteyko 2017a: 453; 457-61).

[1] IPCC Reports are available at: https://www.ipcc.ch/

Comparatively, the British press which was not critical of climate research (i.e., *The Guardian Online* Opinion Pages) presented a higher frequency of CLIMATE CHANGE AS A WAR metaphor to highlight the climate emergency. Later on, the comments presented in *The Guardian* shifted towards an economical point of view, downplaying alarmist implications (Atanasova & Koteyko 2017a: 457-59; 464-5). Our study takes into account events (e.g., IPCC reports and "Climategate") as potential factors of variation in metaphorical use. Our aim is to build on existing research on the role of context in variation in metaphorical meaning by providing a qualitative analysis of the variation in metaphorical meanings (see Chapters 4 to 7).

For example, Shaw & Nerlich (2015) notice an evolution of metaphorical framing that took place between the 1992 United Nations Conference on Environmental Development and the 2012 United Nations Conference on Sustainable Development: the CARBON WARS frame (1990-8) progressively shifted to a CARBON COMPROMISE frame (in 1998-2008; 2015: 35). The linguists note that the WAR-related metaphors were contrasted with the depiction of a *painless* transition with economic arguments (2015: 38). These results need more details about the relation between the two frames: the study lacks indications about how this transfer occurred linguistically (e.g., less alarmist WAR-related metaphors). Koteyko & Atanasova (2017a) partly answer this question: they highlight the fact that WAR metaphors can fulfil different functions in climate change discourses. They can be used to trigger people's attention on the issue, to ask for political commitment, to promote possible solutions, and to advance sceptical arguments (2017a: 299). However, these different interpretations are not discussed in detail as they were all identified in preceding studies that focus on different aspects of climate change.

Similar questions arise from Nerlich & Koteyko's (2010) study: they focus on the economical perspective on climate change in the British press, identifying two metaphorical frames – CARBON GOLDRUSH (e.g., "Bioprospectors' (…) *quest* for green *gold*"; 2010: 43) and CARBON COWBOY (e.g., "the fast growing but increasingly criticized carbon offset industry is at risk of being discredited by *"cowboy"* operators"; 2010: 48) – that involve ethical considerations about carbon offsetting (2010: 39-41; 45). This study reveals that a singular process (i.e., offsetting) can be perceived through different –but semantically related– source domains while fulfilling different arguments regarding ethics. This finding is valuable to our research because it demonstrates how

metaphor users can rely on different aspects of the source domain to justify their arguments.

Analyses of climate change metaphors often oppose different genres and/or views but their similarity (i.e., similar mapping with different viewpoints) is not discussed (e.g., Väliverronen & Hellsten 2002; Olausson 2009).

Foust & Murphy (2009) provide interesting comments on the scientific and journalistic use of RELIGION metaphors in climate change communication: they demonstrate the sceptical interpretation underlying religious expressions and investigate the metaphorical variants that were reversely used to focus on humans' ability to take action (e.g., scientists as prophets who can interpret signs; 2009: 153-56). Deignan, Semino & Paul (2019) question the plurality of interpretations for a single climate change metaphor. They analyse the influence of metaphorical uses in scientific articles and educational texts on children's own interpretations and adaptations. However, the linguists' comparison of interviews data with "accurate" metaphorical meaning (2019: 394) shows that they do not take into account the selection of metaphorical features. Children may only select the features that are relevant to them. In the case of ideological accounts, this selection needs to be investigated because it conveys a specific perspective on the topic that aims at persuading the metaphor recipients to adopt the same point of view.

In our research, we answer the gaps that arise from these existing findings about climate change metaphors: the factors influencing the variation in metaphorical meanings, the subjective interpretation and functions of climate change metaphors in different genres, the relevance of particular narratives and scenarios in each genre, and the influence of a particular climatic event on metaphorical production. In the following chapter, we establish a methodology to fulfil this task. The first part of the methodology addresses the identification and interpretation of metaphor narratives and scenarios, and the second part of the methodology addresses the distribution patterns of narratives and scenarios in our corpus.

Chapter 3: Analysis of data selected from corpora

3.1. Introduction

The analysis of metaphors in a large corpus requires a specific methodology that takes into account the controversy and nature of the topic. The interpretation of the selected data has to be objectively demonstrated, relying on tools that highlight the elements of the texts which semantically convey a particular perspective on climate change.

In this chapter, we detail the problems that have to be taken into account in order to address the research questions set in Chapter 2 and how we have dealt with them. The identification and interpretation of metaphors, the comparison of four genres, the reliance on an electronic corpus, the interpretation of narratives and scenarios, and the distribution patterns in the four genres are discussed. These are important aspects that have an impact on the significance of the findings.

3.2. Aims of the study and research questions

This study investigates the role of metaphors in the explanation of a complex issue: climate change. A number of metaphors have been identified by linguists as being constitutive of this discourse because their familiar features help public understanding. For example, Romaine (1996) shows the prevalence of the *greenhouse effect* metaphor by relating it to the conceptual metaphor, EARTH AS A CONTAINER (1996: 181). The popularisation of such metaphors involves a process of adaptation across different discourses which offer different perspectives on the topic. This adaptation leads to a variation in meaning either because of misunderstanding or because of ideological purposes. Some studies have shown that scientific discourse has been altered by politicians to fulfil a particular ideological purpose. An example of this may be seen in the Plitz's report discussed by Scollon (2008: 138-9). Piltz was part of the Climate Change

Science Program Office of the US government. He worked on a series of reports to communicate the government's climate policies to the public. However, the White House staffers have progressively transformed Piltz's stance on climate change and have added markers of uncertainty within the scientific discourse which the original reports did not display (Scollon 2008: 138-9). This finding raises questions about the role of metaphors in the adaptation of discourse: the interpretation may differ depending on the information the metaphor user wants to convey. In this study, a metaphor, underlying a similar mapping, is not considered to have a single "accurate" meaning (Deignan, Semino & Paul 2019): the analysis of the metaphorical expression used in different genres focuses on the distribution of features that is specific to the context of production.

To demonstrate the role of metaphorical features in the variation in meaning, the context of production has to be analysed (see discussion of *man-made greenhouse effect* in Chapter 2, section 2.5.1.). In discussions about climate change, scientists may use metaphors that display more precise features than in newspapers whose metaphors may display more familiar features. If the features that are mapped during the interpretation are imported from the target domain, then scientists are supposedly able to describe it in more details than journalists because of their specific knowledge of the target. Comparatively, journalists may use more familiar features to facilitate the metaphor recipients' understanding and to attract their attention. Environmentalists may modify the scientific discourse to adapt it to a non-scientific readership. Politicians may adopt a more ideological stance and favour features which correspond to their political background.

The distribution of features can be associated with a specific genre and with specific conventions. The hiding and highlighting of different features demonstrate how the metaphor users understand the metaphor which can lead to a subjective description of climate change. The selection of features can be established by considering the context and the identification of related metaphors (i.e., same source or same target domain) that specify the varying meaning of the metaphor (e.g., the *greenhouse effect* is sometimes described as a *blanket*). By analysing four genres, composed of material produced within a large timespan (1984-2017), we provide an extensive view on the various possibilities of interpretation and on the variation in metaphorical meaning depending on how the issue is framed. This leads to the first main research question:

RQ1: Which metaphorical narratives and scenarios are used in journalistic, scientific, environmental and political discourse about climate change?

By answering RQ(1), we question the prevalence of the scientific metaphorical meaning (Trumbo 1996; Lakoff 2010: 78-9) in different genres. We take into account the metaphor user's understanding and point of view: we analyse the relevant metaphorical features which can explain the misunderstanding or difference of interpretation. The question is treated with reference to the contextual information that affects the production and interpretation of metaphors. We also pay attention to the metaphors appearing in quotes to track the source of the metaphors (Trumbo 1996: 272-3; Nerlich, Koteyko & Brown 2010: 98). We investigate the specific features belonging to "popular" climate change metaphors. The aim is to establish the reason why metaphor users select some metaphors and discard others: the analysis focuses on the function of the metaphor, the identification of features that may produce misunderstanding, the flexibility of the metaphorical meaning, its adaptation to a particular point of view/ to a particular frame, and its relation to events. The latter point leads to the second and third main research questions:

RQ2: What is the distribution of these metaphorical narratives and scenarios across the four genres?

RQ3: To what extent, if at all, has the production/adaptation of these metaphorical narratives and scenarios been influenced by climate change-related events?

These questions address the influence of scientific findings on the use of metaphors. Among these findings, the identification of the anthropogenic cause of the phenomenon has raised scepticism and has been among the most contested issues of the topic (Nerlich 2010: 8; Deignan, Semino & Paul 2019: 379). The rise of scepticism may have had consequences on the methods used to communicate about climate change. A diachronic approach can help us to identify salient metaphors, salient scenarios, and salient narratives that are used to describe these events. The co-text surrounding metaphors is also analysed to observe any change of meaning.

It is also considered that the media – people's primary source of information (Atanasova & Koteyko 2017a: 455) – may, in turn, have adapted scientific communication to present subjective descriptions of climate change. Following sceptical

arguments, scientists may have relied on metaphors that were more understandable to the public (familiar/concrete source domain, conventional metaphors, arising from a "domestication" process; see Brown, Budd, Bell & Rendell 2011: 664-5). We thus rely on the distribution patterns of scenarios and narratives in the four genres to observe whether these genres give prevalence to similar scenarios and narratives when describing climate change or whether the salient scenarios and salient narratives differ in each genre.

The questioning of scientific objectivity and findings may have triggered a phenomenon of metaphorical "responses" to scepticism from scientists and non-sceptical metaphor users. As highlighted in Hellsten's (2000) discussion on the narratives adopted in *The Times* and *Nature* articles about cloning (see Chapter 2, section 2.5.4.), the different opinions on climate change may have resulted in new metaphors to reduce the impact of scepticism or to highlight the irrelevant features of "popular" climate change metaphors (see different interpretations of the metaphor *greenhouse effect* that can be described as a "layer" in Deignan, Semino & Paul 2019: 382; see Chapter 6).

A methodology has been established to select the articles and speeches that compose our corpus. The selection criteria are outlined in the following section.

3.3. Data collection

The comparison of four genres was used in this study to explore different versions of climate change scenarios. The conventions associated with each genre may cause the selection of particular metaphorical features. These genres have been of particular interest because they involve metaphor users who have different concerns, different knowledge, different relations to the readership and different commitments. For instance, journalists are reported to favour an "event-based tactic" of selection of information by commenting on extreme weather events (Doyle 2007: 133) and by paying more attention to local phenomena associated with climate change (i.e., the "domestication" process, Olausson 2009: 422; Brown, Budd, Bell & Rendell 2011: 664-5). They also use familiar expressions to discuss complex issues and to attract readers' attention (Knowles & Moon 2006: 104; Atanasova & Koteyko 2017a: 453), which promotes the use of metaphors (Väliverronen & Hellsten 2002: 230). Journalists aim at reflecting the readers' concern

for an issue which means that the attention shifts when the issue is not relevant to the readership anymore (Trumbo 1996: 274). The point of view on the topic can be related to the editorial choice of the newspaper and can be related to the use of particular metaphors (Atanasova & Koteyko 2017a).

Politicians also use conventional expressions to discuss climate change and produce metaphors to draw a link between political and individual interests (Ly 2013: 152). However, they are sometimes reported to downplay the emergency of the issue by, for example, calling a legislation "the Clear Skies Act" while its outcome would actually increase pollution (Lakoff 2004: 22). Decision-makers use rhetoric to "sound right" (Charteris-Black 2011: 15), to legitimise their policy and to persuade the public that they are taking the right decisions (Williams 2015: 271). Political discourse about climate change is said to originate in scientific communication (Väliverronen & Hellsten 2002: 230).

Scientists aim at widening their readership with the production of analogies to justify their research and promote their findings (Hellsten 2002: 23; Väliverronen & Hellsten 2002: 231). They use metaphors as a "tool of intermediation" to involve decision-makers and incite them to take action (Hellsten 2002: 44; 49).

The communication of NGOs validates and supports scientific research, and sometimes makes use of apocalyptic metaphors (e.g., CLIMATE CHANGE AS A TIMEBOMB; Doyle 2007) to popularise the topic (Doyle 2007: 129-136).

Hence, all kinds of discourse seem to be interrelated and each of them seems to focus on different aspects of climate change. However, the dependence of political, environmentalist, and journalistic discourses on scientific observations and findings is still to be determined, with a focus on metaphors.

The selection of material to compose our corpus started with a review of the UK national newspapers which are expected to include relevant journalistic coverage. *Nexis* (no date)[2] was used as the main database to allow access to a wide range of newspapers

2 *Nexis* (no date) is a database allowing the access to articles from newspapers released in different countries and different languages, with advanced research tools enabling to select articles with particular keywords and times of release (the earliest available articles were published in 1945).

(such as *The Guardian, The Telegraph, The Independent, The Times, Daily Mail, The Express, Mirror*). The research was restricted to UK national newspapers and to specific search terms: "climate change" or "global warming" or "anthropogenic" (in headlines). The latter term was included because of its association with scepticism and controversial findings established in scientific reports. *Nexis* archives go back as far as 40 years ago (*Nexis* no date) so the results were browsed to find the chronologically first article that explicitly dealt with the topic. When articles discuss extreme weather events that were not directly associated with climate change (i.e., before the phenomenon was identified as such), texts were not included in the corpus. Therefore, a timespan was established starting in 1984 and ending in 2017. This timespan was adopted for the whole corpus, except for NGOs' publications (see below).

To select scientific publications, articles were downloaded from *Web of Science Core Collection* (no date). This database allows access to texts published in a variety of scientific international journals (e.g., *Global Journal of Environmental Science and Management-GJESM, Review of Environmental Economics and Policy, Agricultural History, Chemical Engineering Journal, Science of the Total Environment*) and displays articles that were published as early as 1945, which helps the chronological search for references. The selection was restricted to the journal *Nature:* during this selection, we observed that the scientific articles displayed very complex discussions of climate change to the extent that the relationship between climate change and the content of these articles was too ambiguous to be understood by a non-scientist (e.g., "Extinction and exhumation of the HP/LT rocks in the Hellenic forearc ridge" Marsello, Kidd, & Graver 2010, *American Journal of Science*). In order to corroborate a link between the selected metaphors and climate change, we selected articles whose titles and abstracts include the phrases "climate change" or "global warming" so that the main topic of these articles could be identified more easily. This further selection revealed that the journal *Nature* releases a greater number of articles whose titles and abstracts are explicitly related to climate change, compared to other international scientific journals. Additionally, these articles could be accessed with an institutional account, which facilitates the analysis of a large number of articles. The geographical origin of these publications (e.g., articles authored by British, American, Australian scientists) was not considered because the journal is international in scope.

Political speeches were retrieved from the database *BritishPoliticalSpeech* which is the result of an academic research project[3]. The speech archive goes back to 1895 and the research can be filtered with search terms, speakers' identities, political parties, and search dates. Similar search terms and timespan were used to limit the results. Speakers' identities and political parties were not specified because our aim was to gather speeches that display different opinions on the topic. However, once the metaphor was identified within a particular speech, the period and political party associated with each speech were researched. This research allows us to analyse the potential influence of the party ideology on the description of climate change, and the interpretation of and the reference to related events/ discourses. Contextual information such as the place in which the speech took place, the debate it was included in, the year of production, the politician's identity and party are available in the introduction of each speech. This database was favoured to retrieve political speeches because it exclusively displays public speeches produced by party leaders. Hence, the spoken characteristics of the texts may not impact our results because a written production of these speeches preceded the spoken production. Other databases may offer a wider variety of speeches[4] but our focus on written texts made the selection from *BritishPoliticalSpeech* more relevant, because speeches from the UK Parliament (as proposed by *Hansard*) may involve characteristics which are specific to the oral production and interaction observed in such texts. Additionally, we focused on speeches from the Conservative, Labour, and Liberal Democrat parties in order to compare the political stances with the journalistic stances (e.g., Conservative newspapers, Liberal newspapers). We also paid attention to the politicians' involvement in decision-making (following elections) because their metaphorical descriptions of climate change would be more likely to be adapted in articles from different genres which inform readers about such political decisions. Our corpus does not include speeches from the Green Party because the party's stance cannot be compared to the journalistic stance (e.g., there is no national "green" newspaper) and this party has rarely, if at all, been involved in political decision. Hence, the Green Party's stance would be comparable to the environmentalists'

3 (Finlayson & Atkins no date)

4 like *Hansard* (no date)

stance on climate change: their perspective on the environment is not sceptical and they cannot enact particular decisions.

To analyse data from NGOs publications, we had to decide which NGO would be included in our study. Our analysis of the texts mentioned above shows many references to *Friends of the Earth*[5]: this is an international federation that was created 48 years ago and that focuses on people's health and environmental protection (in a dedicated "about us" section of the official website). Archives of press releases could be found on the official website and could be browsed by subjects (i.e., "climate change") or years, which means that the research could not be restricted by specific terms and the relation between the content of the articles and climate change was determined during the analysis. The website does not allow access to texts published before 2001: this particularity has to be taken into account while analysing the chronological evolution of narratives in our corpus (see section 3.7.). Further research for NGOs archives (such as *Greenpeace* 1971, *WWF* 1961, *Earth Liberation Front* (no source), *Green Alliance* 1979) exposed important limitations: important updates of articles, restricted access to archives, and absence of an official website were the main factors that led to their exclusion. However, *Friends of the Earth* provide a good reflection of the environmentalists' attitude towards climate change and solutions to mitigate the phenomenon. This NGO offers an international view on climate change which focuses on the global environmental effects. Table 1 (below) summarises the particularities of our corpus:

5 *Friends of the Earth* was created in 1969

Table 1: Details of the corpus (larger version)

Genres	**Newspapers**	**Scientific papers**	**Publications from NGO**	**Political speeches**
Source	*Nexis*	*Nature*	*Friends of the Earth*	*BritishPolitical Speech*
Number of articles (1984-2017)	19,535	444	867	98
Words/article (average)	704.014	1,539.96	621.323	4,588.4
Words (total)	13,752,921	683,742	538,687	449,663
Scenarios (occurrences)	3,294	522	316	76

Our focus on a plurality of newspapers and of political speeches as opposed to a single scientific journal and a single NGO is justified by the specific aim of our research. While scientific and environmentalist arguments about climate change rarely, if at all, dispute the reality of phenomenon, newspapers and politicians can rely on a variety of arguments which can either support scientific and environmentalist stances or question existing assumptions about the topic, i.e. metaphors in political speeches and newspapers are more likely to fulfil sceptical arguments compared to scientific and environmentalist metaphors.

3.4. Analysis of a large corpus

The collection resulted in a large number of articles allowing the analysis of a wide variety of metaphors. Even though a manual selection of metaphors would present more accurate

findings, the impossibility of reading each text had an impact on the scope of our results and generates new methodological requirements.

Deignan & Porter (2004) acknowledge the value of the analysis of a large corpus and emphasise the need to determine in advance specific lexemes for the study. They randomly select manageable text samples from an electronic corpus to study the use of the metaphor ANGER AS HEAT/ PRESSURE (2004:1232-34). The frequent collocates of metaphorical expressions are identified and support the precision of the research by limiting the number of data (2004: 1234-36). The collocates are also analysed in the study of online comments about climate change by Koteyko, Jaspal & Nerlich (2013). To determine the metaphors to be analysed, Grundmann & Krishnamurphy (2010) focus on a specific discourse (i.e., discourse about climate change) and use the "word frequency list" function of an electronic corpus to identify terms (e.g., "carbon", "climate", "warming", "ozone", etc.) whose collocates are likely to reveal metaphorical meaning (e.g., "*runaway* greenhouse effect"; 2010: 129; 140-141). Collocates can also be used to identify the various interpretations associated with a specific metaphor, whose source and target domains have to be determined prior to the research (Demmen et al. 2015: 206; 211-2). To determine specific search terms, Sardinha (2012) suggests reading a sample of the corpus (about 30% of the total number of texts) to manually select metaphors and to look for similar instances in the whole corpus (2012: 29-31; see also Charteris-Black 2004: 178). Koller (2004) uses existing literature on metaphors about business and reads a manageable section of her corpus to identify the metaphors which are then searched in an electronic corpus. She finds associated lexical fields and synonyms that may be used metaphorically in the texts (2004: 47-9/ see also the use of lexical fields to identify metaphor in Stefanowitsch 2006). This methodology can be adapted to compare several corpora: Cameron & Deignan (2003) manually search for "tuning devices" in a manageable sample of texts and compare their relevance in a larger corpus.

These methodologies often result in quantitative findings, favouring a *corpus-driven* approach that provides a description of the totality of the data with reference to frequencies and recurrent patterns (Tognini Bonelli 2001: 84). This approach is not consistent with our research questions. In our study, a large amount of data is analysed to identify a variety of scenarios. Our research relies on a *corpus-based* approach that focuses on the qualitative analysis of the association between an expression and its

context, downplaying systematic patterns (Tognini Bonelli 2001: 65; 81-87). In this study, the existing methodologies used to analyse a large corpus are, therefore, adapted to demonstrate that the context, the genre, the period of production, and the authorial stance may have an influence on the metaphorical meaning.

This is achieved by relying on existing literature on climate change discourse which presents a number of metaphors that are sometimes described as having an explanatory function. As discussed in Chapter 2 (section 2.6.2.), the inquiry of these studies differs from our focus on metaphorical features and variation in meaning. However, this literature helps to determine some terms that are likely to be used in our corpus and could be relevant to the initial search. For example, Romaine (1996) analyses the *greenhouse effect* metaphor; Cameron (2003: 169) mentions the *blanket* metaphor; Nerlich, Koteyko & Brown (2010: 104) notes the use of AGEING metaphor; expressions such as *acid rain*, *ozone hole* and *library of life* are discussed in Väliverronen & Hellsten (2002: 229; 235); Deignan, Semino & Paul (2019: 394-6) study the *release* and *trap* metaphors; *carbon* compounds (e.g., *carbon footprint*) are investigated by Koteyko (2010); and Van Der Hel, Hellsten & Steen (2018) analyse the *tipping points* metaphor. These instances are presented as explanatory in the literature and their use across genres is often mentioned, which shows their popularity in climate change communication. In the progress of our initial search, occurrences of these expressions have been explored in our corpus. A further selection has been processed by considering the functions and interpretations of these expressions in each genre (see following sections).

Our approach is similar to Koller's (2004) and Deignan & Porter's (2004): a part of the search terms is determined in advance and their occurrences are explored in our corpus. To provide new findings, metaphors are also identified manually by reading manageable samples of our corpus (as demonstrated in Cameron & Deignan 2003; Charteris-Black 2004; and Sardinha 2012). The analysis of four genres over a 33-year timespan determines the size of the samples composed of 10-20 articles/ speeches per year. The number of articles analysed manually depends on the frequency of relevant findings: some articles analysed manually did not display any metaphorical expression related to climate change. At the initial stage, the manual analysis does not aim at identifying metaphors used in all genres but at selecting new instances of metaphors not discussed in existing literature. For example, the metaphorical expressions *fingerprint*,

climate forcing, *climate justice*, *ecological debt*, and the conceptual metaphors HUMANITY/NATURE AS A FAMILY and NATURE AS A DAMAGED BODY were identified in our corpus (see section 3.5.), but have not been previously analysed as shown in Table 2 below:

Table 2: Metaphors identified in climate change literature and metaphors identified during our corpus analysis

Metaphorical expressions/ mappings identified in literature	**Metaphorical expressions/ mappings identified during our manual analysis**
Greenhouse effect; *Blanket;* *Ozone hole;* *Release;* *Trap;* *Carbon footprint;* *Carbon capture* EVOLUTION AS AGEING GREEN FOR THE ENVIRONMENT CLIMATE CHANGE AS A RELIGION CLIMATE CHANGE AS A WAR	*Climate forcing – climatic response/feedback;* *Climate justice;* *Ecological debt;* *Runaway;* HUMANITY/NATURE AS A FAMILY NATURE AS A DAMAGED BODY CLIMATE CHANGE AS A CRASHING TRANSPORT

This table provides a preliminary overview of the metaphors that can be observed in climate change communication. In the following stages of our research (discussed in the following sections), these expressions become search terms and their occurrence(s) are investigated in the totality of our corpus. The occurrences of the same metaphorical expression are individually interpreted through the particularities of the co-text (e.g., *man-made* greenhouse effect).

The co-text helps to determine whether the term is metaphorically used and establishes the way the metaphorical meaning varies depending on the foregrounded features. We rely on the co-text to identify a scenario and distinguish relevant metaphorical occurrences (i.e., interpreted as part of the scenario) from metaphorical

occurrences which cannot be interpreted as scenarios and which cannot be considered for our research. For example, we have observed occurrences of "Mother Earth Day". While *mother earth* is a relevant metaphorical expression (see Chapter 4), these occurrences do not establish the particular characteristics attributed to the MOTHER and have therefore not been discussed in our research. The identification of scenarios highlight a semantic relation between different source domains (this relation is established with an electronic corpus, see following sections). The semantic link between source domains reveals the presence of a narrative and constitutes a first set of findings which were subjected to further analyses, as illustrated in the following sections of this chapter. The influence of the metaphor user's subjectivity, genre, and period of production can then be examined.

3.5. Use of the *British National Corpus* to identify metaphors: adjustments to the Metaphor Identification Procedure [6]

The reliance on an electronic corpus can provide information to address several problems that appear throughout the examination of data. On the one hand, the comparison of uses of a potentially metaphorical expression in our corpus and in the BNC helps to distinguish metaphorical from "literal" uses (see below). On the other hand, the functionalities proposed by *SketchEngine* (e.g., *WordSketch* which establishes the most frequent collocates of a search term across contexts, Kilgarriff 2003), from which the BNC is accessed, constitute a methodological improvement to retrieve relevant data (see below).

The manual analysis of text samples from our corpus to identify metaphorical occurrences requires a specific methodology to distinguish metaphorical uses from literal uses. The question of metaphorical identification has been addressed by Steen et al. (2010): the Metaphor Identification Procedure (MIP) proposes a four-step analysis which includes text reading, selection of lexical units, interpretation of these units in context and the search for a more basic meaning in other contexts, and finally, the interpretation of this basic meaning in the context under study (2010: 4-6). Steen et al.'s (2010) focus on the role of the context to determine whether the lexical unit is used metaphorically or

[6] (Steen et al. 2010)

literally makes this methodology relevant to the research questions addressed here. In recent reviews of the MIP (Rejnierse, Burgers, Krennmayr & Steen 2018a; 2018b), the procedure focuses on the communication level: the linguists use the dictionary to establish the different ways in which words can be interpreted (Reijnierse, Burgers, Krennmayr & Steen 2018a: 134; 2018b: 13). The lexicalisation of the metaphorical meaning (i.e., the contextual meaning of the metaphor is defined in the dictionary) is explored to identify the referential meaning in the utterance (Reijnierse, Burgers, Krennmayr & Steen 2018a: 134; 2018b: 10). For instance, when the metaphorical meaning is not lexicalised, it leads to a new perspective on the target domain which indicates that the source domain plays a role in the referential meaning of the utterance (steps 4 and 5 of the Deliberate Metaphor Identification Procedure, Reijnierse, Burgers, Krennmayr & Steen 2018a: 134; 137; 2018b: 13-14). These additional steps help to interpret the communicative goals when the metaphor is used (Reijnierse, Burgers, Krennmayr & Steen 2018b: 34). We applied these methodological steps to interpret metaphorical expressions in our corpus. However, the linguists do not specify how the different contextual meanings attributed to a single search term can be contrasted (if the term is used metaphorically) and related to each other (Reijnierse, Burgers, Krennmayr & Steen 2018a: 143): for example, metaphor users can describe a literal *greenhouse*, whereas other users can describe a beneficial, natural *greenhouse effect* or a dangerous *greenhouse effect*.

To minimise subjective interpretation, the BNC was used. This electronic corpus gives access to a variety of contexts including a specific search term. However, this yielded a large number of data which could not be analysed in its integrity. The potential for errors (no electronic tool can accurately distinguish a metaphorical from a literal meaning) also prevents a complete reliance on frequencies of occurrences.

To overcome these difficulties, the online version of the *Oxford English Dictionary* (no date) was consulted to provide an overview of the literal meaning(s) of the word and its possible metaphorical meaning(s) (the metaphorical meaning can often be identified in the dictionary with the annotation “fig.”). Then, we searched the specified term in the electronic corpus using the functionality *WordSketch* which organises data according to the frequent collocates of the term. The research can be specified by selecting a particular collocate which gives access to the related contextual information. Since our research focused on the use of metaphors adapted in different genres, some of the results

displayed by the BNC were likely to be part of a context that is similar to our corpus (i.e., texts about climate change). This exploration of the BNC is aimed at analysing the "basic" meaning of the metaphors (Steen et al. 2010), the collocations that are likely to occur in contexts related to climate change are not investigated. Instead, we compared the ("literal") definitions provided by the OED to the *WordSketch* results so that the reference to the BNC data (which possibly show a more basic, concrete meaning of the search term) can determine the metaphorical interpretation in our corpus. We compared the contextual samples presented in the BNC to the use of the expression in our corpus and the availability of a plurality of occurrences in the electronic corpus helps to specify which features are at play. The differences between the contextual meanings (in our corpus) and the "basic" meanings (in the OED and the BNC; Steen et al. 2010: 37) made it possible to identify the relevant interpretation.

To illustrate this methodology, the example of the term of "greenhouse" may be used. This term was searched in the OED (accessed 22/06/2018). Three definitions are presented: 1. "A structure with walls and roof made chiefly of glass or translucent plastic in which plants requiring regulated climatic conditions are grown"; 2. "*Ceramics*. An area in which 'green' or unfired ware is left to dry before being placed in the kiln"; 3. "*Aeronautics slang*. The glass cockpit cover of an aeroplane". However, these definitions do not always provide enough details about the "basic" meaning of the word. The term was searched in the BNC using *WordSketch:* collocates such as "effect", "warming", "emission" are assumed to relate to climate change discourse. Other collocates such as "heated" (6 tokens), "cool" (5), "new" (5), "cordon" (5), "heater" (5), "build" (7), "conservatory" (12), "frame" (11), "shed" (5), and "garden" (10) were also investigated. The limitation of our analysis to the most frequent collocates may have prevented the examination of any specialised meaning but, as noted in Chapter 2, the metaphorical interpretation relies on prototypical features and common knowledge (Kittay 1987: 238; Glucksberg & Keysar 1993: 416; Steen 1994: 41).

This methodology supports the manual analysis of the results of the BNC because each collocate is associated with a manageable quantity of data. When the link between a collocate and the contextual meaning of the word is not certain, the data associated with the collocate can be analysed and the interpretation can be determined (e.g., the collocate "heater" may be associated with climate change discourse or with a more basic meaning).

The context provided for each collocate aforementioned effectively refers to a more concrete meaning of the word that can be compared to definition (1) of the OED. For example, the data associated with the collocate "heater" display contextual elements that indicate a more "basic" interpretation of "greenhouse" as in: "If you do use an electronic convector *heater*, make sure you get one suited to humid atmospheres – possibly a *greenhouse heater*" (token number: FBN-105911814). In this example, "electronic convector heater" is compared to "greenhouse heater" on the basis of the "atmosphere" in which each heater is to be used. "Greenhouse" refers to a humid space that seems to be closed (because a certain temperature is to be kept by the specific heater). Compared to the definitions displayed in the OED, this interpretation leads to definition (1). Contrarily, definition (3) suggests a scientific description belonging to the domain of aeronautics: the contextual information in the example from the BNC differs from this scientific interpretation. While the dictionary specifies the possible meanings of a word, the availability of a plurality of examples in the BNC helps to distinguish the features associated with a concept so that the hidden and highlighted features in our corpus could be identified.

This methodology still partly relies on intuition: for instance, the word "force" was cited as one of the collocates of "greenhouse" in the BNC and was initially assumed to be associated with a more "basic" meaning of the search term. Yet, the related data show frequent references to climate change (with words such as "climate", "global", "CO2", and "plausibility"). Despite such inconsistencies, this methodology produces an overview of the possible interpretations of a particular search term and helps to detect the interplay between the "basic" and contextual meanings as they occur in our corpus.

To improve the scope of our findings, the use of the BNC and *SketchEngine* functionalities were used to identify the relevant data that were previously unnoticed despite our established methodology.

Following Koller's (2004) procedure, the metaphorical expressions that were identified during the manual analysis of samples from our corpus and the ones described in existing literature were searched in the BNC using the *Thesaurus* tool (from *SketchEngine*, Kilgarriff 2003). This tool displays a list of words whose co-texts can be compared to the most frequent co-texts of the search term (i.e., they can be defined as

hyponyms, hypernyms or synonyms of the search term). For example, the words listed for the search term "greenhouse" are, among others, "aquarium", "outhouse", "garage", and "container". These words were searched in our corpus to identify metaphors that can be related to the metaphorical expression observed prior the use of *Thesaurus*. This process helps to find other instances belonging - to some extent - to a similar source domain. The BNC results may display words that refer to the target domain of the metaphor (e.g., one of the words listed for "greenhouse" is "pollutants") thus, the available examples need to be reviewed to determine the interpretation.

These additional observations resulted in a wider range of metaphorical occurrences selected for the analysis (e.g., *fingerprint, climate forcing, ecological debt,* EARTH AS A HOME/HOUSE, HUMANITY/NATURE AS A FAMILY, NATURE AS A DAMAGED BODY) from those retrieved from the literature (*escape, release, carbon capture/sequestration, trap, greenhouse effect, blanket, carbon footprint*, GREEN FOR THE ENVIRONMENT, CLIMATE CHANGE AS A RELIGION, CLIMATE CHANGE AS A WAR). This selection is illustrated in Table 3 below. This selection is specified by the function of metaphors and by the semantic association that can be observed in our corpus.

Table 3: Identification of metaphors in climate change literature, in the BNC, and during the corpus analysis

Metaphorical expressions/ mappings identified in literature	**Metaphorical expressions/ mappings identified during our manual analysis**	**Metaphorical expressions identified in the BNC**
Greenhouse effect; *Blanket;* *Ozone hole;* *Release;* *Trap;* *Carbon footprint;* *Carbon capture* EVOLUTION AS AGEING GREEN FOR THE ENVIRONMENT CLIMATE CHANGE AS A RELIGION CLIMATE CHANGE AS A WAR	*Climate forcing – climatic response/feedback;* *Climate justice;* *Ecological debt;* *Runaway;* HUMANITY/NATURE AS A FAMILY NATURE AS A DAMAGED BODY CLIMATE CHANGE AS A CRASHING TRANSPORT	*Fingerprint;* *Furnace;* *Oven;* *Boil;* *Roof;* *Nurture;* *Fugitive;* *Boat-train-plane*

In the next section, the variation in metaphorical meaning is discussed to explain how we determine the viewpoint adopted by the metaphor users. The selection process, related to the meaning and function of relevant metaphors, can be improved with the functionalities proposed by the electronic corpus.

3.6. The relevance of the selected metaphors

The metaphors under study display particularities that distinguish them from ubiquitous metaphors. In this section, we describe a methodology to define the functions of metaphors. Additionally, the connection between explanatory metaphors and metaphorical variation in meaning is explained with reliance on the BNC and the

significance of the connection is illustrated and related to specific perspectives on climate change.

3.6.1. Variety of metaphorical meanings: variety of metaphorical functions

As argued throughout, a metaphor can convey different meanings when it is adapted across texts and genres. A metaphor may fulfil an explanatory function in some contexts but not in others. Additionally, the variety of possible interpretations may have an influence on the hiding and highlighting of metaphorical features. Hence, providing a strict definition of all elements that compose the metaphorical meaning across all uses is impossible. However, some procedures can be organised to demonstrate in which respect a metaphor provides an explanation and is then adapted to fulfil different functions.

We paid attention to the context of use: some metaphor users may adapt an explanatory metaphor while acknowledging the fact that they are not familiar with the derivative features of the notion. This gradation of knowledge can be identified in texts through, for example, the use of quotes or indirect speech. Such uses can also be interpreted as a kind of disagreement: the metaphor user explicitly refers to a different text to highlight that he/she was not at the origin of the notion and of the text associated with it. For instance, newspaper articles present several occurrences of "so-called greenhouse effect" while other articles refer to this notion without explicitly mentioning previous discourses. Depending on the co-text, this phrase can either mean that the journalist recognises the metaphorical meaning (e.g., other instances related to this notion are sometimes referred as "greenhouse-like effect" which displays a marker of analogy), or that he/she questions the validity of such a notion. The phrase "so-called", preceding a metaphorical expression originating in a different discourse, can either indicate that the metaphor user highlights that the metaphor is not his/hers (it acts as a reference to possibly legitimise what is written in the article) or that the meaning associated with this metaphor differs from his/her interpretation. In the latter case, the phrase presupposes that the metaphor is popular and acts as a way to identify the target domain (the metaphor user may need to use it to be understood) but the metaphor user emphasises that the ideological meaning of the metaphor is part of the discourse in which the expression originated and is not part of his/her own discourse (these aspects are discussed in the analysis of data).

The function of a metaphor can sometimes be perceived when the details of the analogy are described by the user: when the metaphor is explanatory, these details show that the metaphor qualifies a complex notion and that it eases the understanding of specific features (as opposed to the use of the "literal" term). These analogical details were observed in the articles written in the 1980s, when the phenomenon of climate change was introduced to a wider community:

(1) There is, for instance, the notorious **'greenhouse effect'** - the carbon dioxide layer created by the burning of fossil fuels, which allows the sun's rays free passage on their way down but blocks the radiated heat on its way back to create an inexorable rise in the temperature of the earth's crust. *The Times*, December 30 1987 "Spectrum: It's going to turn out very nasty", W.-J. Burroughs and William Greaves.

In extract (1) from our corpus, the adjective "notorious" shows that the metaphorical expression *greenhouse effect* has already been acknowledged by the population but the details provided after the metaphor ("the carbon dioxide…the earth's crust") show that the journalists justify its association with the phenomenon of climate change. The metaphorical expression *greenhouse effect* is used as an umbrella term to explain the causes and effects of climate change and the reason why the problem needs to be solved. The details of the metaphorical interpretation mentioned in the text show that, despite this explanatory function, the analogy might not be "accurately" understood by the metaphor recipients because they do not have a direct experience of this effect. Hence, the journalists re-scale the features of the source by describing it as global ("earth's crust") while a "literal" greenhouse is less geographically expanded, with limits that are well-delineated. The extract also displays several occurrences of the JOURNEY metaphor: "free passage on their way down"; "blocks"; "way back", which are metaphorical collocations, and which highlight the adaptation and re-scaling of the meaning of the metaphorical expression *greenhouse effect* (see below).

This extract demonstrates that metaphor users can associate explanatory metaphors with persuasive and ideological contexts (for example, journalists may emphasise the danger of climate change and explain that individual experiences do not disprove the existence of a global phenomenon). The link between the explanatory function and other possible interpretations helps to identify the metaphorical meaning. We can also determine the function with the possible bias associated with context-related

use and/or with the exploitation of the source domain of the metaphor (e.g., NATURAL GREENHOUSE and DANGEROUS GREENHOUSE).

An explanation makes a notion more intelligible; it might be ideologically oriented but in regards to metaphors a parallel is drawn between persuasive and explanatory functions. An explanatory metaphor in climate change discourse is defined as a linguistic means to clarify a notion by relying on more familiar and concrete domains (MacGlone 2007; Kendall-Taylor, Erard & Haydon 2013; Volmert 2014; Thibodeau, Crow & Flusberg 2017) and the user of such metaphors takes for granted the existence of this notion (at the analogical level). The user's opinion about the existence of the notion is translated in the co-text surrounding the metaphor. This definition limits the scope of our research to metaphorical units whose adaptation across texts and genres produces a variation in meaning. This variation may be related to a specific perspective on the notions described by these metaphorical units. For example, the function of the metonymical use of *green* were investigated. A research of frequent collocates in the electronic corpus highlights its persuasive use: the "green" feature of elements that normally display this colour (when the term is used "literally", e.g. "green field") is often positively described through adjectives such as "pleasant" and "tranquil". We can also identify this positive bias in our corpus through depictions of *green* resources as *clean* resources to save the planet (this has also been acknowledged by Romaine 1996: 176, and Pérez-Sobrino 2013). The metonymical use of *green* serves an ideological function.

To qualify the source domain as more familiar or concrete than the target domain, the electronic corpus helps to identify the discourses in which the metaphorical expression frequently occurs. We expect that words related to the target domain are mainly used in scientific discourse while words related to the source domain are used in a plurality of contexts, which demonstrate their familiar pattern. To illustrate this distinction, the case of the word "blanket" may be used as an example. The term was searched in the BNC, using *WordSketch* and *Thesaurus*. These tools display a list of collocates and semantically related words which belong to everyday vocabulary (i.e., none of them necessitated the use of a dictionary): "electric", "woollen", "wet", "grey"; "towel", "cloth", "cloak".

The word "dioxide" (often used in climate change discourse) was also searched using the same functionalities, resulting in a list of highly specific words that mainly

belong to scientific discourse: "carbon", "sulphur", "nitrogen"; "oxide", "methane", "hydrogen". This distinction can justify our interpretation and demonstrate the analogical process performed by the metaphor user to describe the notion.

Additionally, the comparison of genres can reveal the presence of metaphors: a target domain discussed in scientific discourse may be described in a different way in discourses produced by metaphor users who do not share the same knowledge about climate change, and who may rely on more familiar words (e.g. *blanket* can refer to *greenhouse* gases). Our focus on the collocates of metaphors also reveals different ways to deal with a target domain and the differences that appear may be explained in terms of different metaphor scenarios.

3.6.2. The identification of narratives, scenarios, and perspectives with the BNC

Metaphors can be related to other (metaphorical) expressions that seem to modify the interpretation of the topic. The "objectivity" of the explanatory function can be assessed by the context of use. In such cases, the linguistic elements of the context (including related metaphors) convey a specific perspective on the metaphorical meaning. The reliance on other discourses in a text can be adjusted by "unconventional" elaborations of a "popular" climate change metaphor (i.e., "revitalisation"; Semino 2008:20; Steen 2011a: 51; 56-7). We also paid attention to the characteristics of the articles/ speeches belonging to a specific genre. The biography of each metaphor user was carefully checked to guarantee that the press scenarios (NEW) were produced by journalists, the scientific scenarios (SCI) were produced by scientists, the environmentalist scenarios (ENV) were produced by environmentalists, and the political scenarios (POL) were produced by politicians.

Another methodological step was required when metaphorical expressions appear in quotes. To include these expressions as part of a specific genre, we first investigated the identity and function of the metaphor user. In cases where the user is part of the discourse community related to the genre the article belongs to (e.g., environmentalist articles quoting an environmentalist), the scenario was included in our research. In cases where the expression is attributed to someone from a different discourse community (e.g., journalists quoting a politician), we looked for contextual information to observe the

metaphor user's stance on the meaning of the expression (e.g., questioning, confirming the metaphorical interpretation in the quoted speech). In cases where such a stance occurs in the text, the scenario was included but in cases where the metaphorical use was not noticed and discussed by the author of the article, the metaphor was not selected.

The analysis of variation in metaphorical meaning demonstrates how semantically related metaphors can, on the one hand, highlight the features that are relevant for the interpretation, and on the other hand, establish the point of view adopted to discuss climate change. Our corpus analysis has helped us to identify various scenarios which are illustrated in Table 4, below:

Table 4: Overview of the scenarios identified in our corpus

	Scenarios (overview)
Chapter 4	UNAFFECTED ENVIRONMENT AS GREEN; EARTH AS A HOME; HUMANITY AS A FAMILY; NATURE AS A FAMILY; NATURE AS A MOTHER; NATURE AS A HIGHER AUTHORITY/GODDESS; PRE-INDUSTRIAL WORLD AS EDEN; CLIMATE CHANGE AS HELL; POLLUTION AS A SIN
Chapter 5	DAMAGED RESOURCES AS DAMAGED LUNGS; DAMAGED RESOURCES AS DAMAGED BLOOD; SOLUTIONS AS MEDICAL SUPPORT; CLIMATIC DAMAGES AS A LOSS OF CONTENT; SOLUTIONS AS A CAPTURE/SEQUESTRATION
Chapter 6	(POLLUTED) EARTH AS A GREENHOUSE; POLLUTION AS A TRAP; POLLUTION AS A HEATED CONTAINER; WARMING AS A BLANKET; POLLUTION AS A FOOTPRINT
Chapter 7	CLIMATE CHANGE AS A SINKING BOAT; CLIMATE CHANGE AS A CRASHING TRAIN; CLIMATE CHANGE AS A FAULTY PLANE; CLIMATE CHANGE AS A FORCED INTERACTION; CLIMATE CHANGE DECISIONS AS A WAR; CLIMATE CHANGE AS A CRIME; SOLUTIONS AS JUSTICE

In our analysis, narratives are understood as a selection of metaphors (Hellsten 2002: 52). The methodology explained in existing studies (Bamberg 2004: 257; Labov 2006: 37; Jucker 2010: 71; Hanne 2014: 13) cannot be adapted to identify narratives in our corpus because these studies do not always focus on metaphors to identify narratives within discourse units. Our focus is on how the source domains of the scenarios previously identified (Table 4) can be used by the metaphor users to metaphorically "frame" the discussion about climate change (Hanne 2014: 1).

The semantic link between source domains is determined with the data provided by the BNC. We distinguished semantically related metaphors from semantically unrelated metaphors by applying the methodology defined in the section 3.4. (namely, the analysis of collocates and the search for hyponyms, hypernyms, synonyms). We identified and selected metaphorical expressions which revealed comparable mappings (similar source and/or target domains) and comparable perspectives on the topic. The definitions provided by the OED can also help to highlight a semantic link because the source domain may be defined with reference to a word that is also used metaphorically in our corpus (e.g., the definition (1) of "greenhouse" is compared with the definition of "glasshouse"). The influence of these expressions on the interpretation is illustrated with the co-text, which determines how the issue is framed in the articles, and with the functionalities provided by *SketchEngine*, such as *SketchDiff* and the *Concordance filter* (Kilgarriff 2003). *SketchDiff* allows the comparison of two search terms with a list of the frequent collocates associated with each of them. The *Concordance filter* provides data that display the two search terms within the same context (separated in the text by 0 to 15 tokens). The results show additional information about the metaphorical meaning.

To illustrate this methodology, the metaphorical expressions *footprint* and *fingerprint*, identified in our corpus, were compared in the BNC (accessed 23/06/2018). *Footprint* and *fingerprint* were identified as metaphorical terms prior to the research of the electronic corpus: the most frequent collocates of "footprint", displayed by *WordSketch*, are "clear", "large", "same", "produce", "leave", "find", "yield", "see", "observe", "evident". The most frequent collocates of "fingerprint" are "DNA", "man", "system", "leave", "find", "take". The common frequent collocates ("leave" and "find", as presented by *SketchDiff*) were investigated to establish contextual differences. The contexts presented for "leave" and "fingerprint" reveal a link with crime descriptions in

which “detectives”, “blood”, “thief”, “murder” are mentioned (in 10 collocations out of 11). The contexts presented for “leave” and “footprint” are more diverse with 7 crime descriptions, 3 descriptions in which a character has to escape a situation (without explicit reference to a crime) and 3 descriptions linked to the natural environment (with words such as “clay” and “snow”). Similarly, the totality of the contexts presented for “find” and “fingerprint” (7) is related to crime scenes while the contexts for “find” and “footprint” (8) are much more diverse with 3 descriptions of scientific discoveries, 1 description of characters working on a script, 2 descriptions of characters searching for someone (the disappearance is not explicitly described as a crime), and 2 crime descriptions. We investigated the data presenting concordances of “footprint” and “fingerprint”: 2 out of the 3 descriptions displayed are related to crime scenes with words such as “weapons”, “scene-of-crime”, and “victim” (the other description refers to story writing). Hence, we can distinguish the use of *fingerprint* in our corpus from the use of the more popular metaphorical expression *footprint* (Koteyko 2010). *Fingerprint* includes the target domain within a crime narrative: CLIMATE CHANGE AS A CRIME (see Chapters 6 and 7).

The comparison of four genres involves a focus on narratives that are common to most of the genres under study. The identified metaphors and the co-text have been closely examined to define narratives. These narratives are composed of metaphors whose interpretation allows us to characterise them as scenarios within the same narratives: their various versions in our corpus highlight a plot and the scenarios that are part of this plot involve new shifts and views on the topic. Some metaphorical expressions have not been discussed in our research because of a lack of contextual information or because their occurrences in our corpus do not involve a major twist within the narrative. For example, we have noticed several occurrences of the *greenhouse effect* metaphor in our corpus which describe the human origin of pollution (e.g., “human emissions of *greenhouse* gases”), as opposed to the human origin of the effect (e.g., “man-made *greenhouse effect*”). Occurrences such as “human emissions of *greenhouse* gases” do not provide additional details regarding the narrative associated with the use of the metaphorical expression *greenhouse effect* (which depicts pollution as forming a CONTAINER).

Additionally, the identification of narratives has restrained the selection of metaphors. In our research, we did not aim at providing an exhaustive picture of climate

change metaphors. We focused on narratives and scenarios because these devices help to identify patterns of metaphorical use in different genres and periods. The metaphors which may be used in different texts but which do not fit the main narratives observed in the four genres, and whose interpretation does not highlight any plot and therefore cannot be identified as scenarios (e.g., *tipping points*, *acid rain*) were not selected. Table 5, below, summarises the narratives we identified in our corpus:

Table 5: Overview of the narratives identified in our corpus

	Narratives
Chapter 4	EARTH AS A HOME and HUMANITY/NATURE AS A FAMILY; CLIMATE CHANGE AS A RELIGION
Chapter 5	NATURE AS DAMAGED BODY; NATURE AS A DAMAGED CONTAINER
Chapter 6	EARTH AS A TRANSFORMED HOUSE; POLLUTION AS A DANGEROUS TRACE
Chapter 7	CLIMATE CHANGE AS A CRASHING TRANSPORT; CLIMATE CHANGE AS A CONFLICT

We supplement the study of narratives and scenarios with the identification of perspectives on climate change: the perspectives reveal the target domain(s) described by the metaphors (e.g., pollution, environmental decisions, scientific experiments, climatic predictions). The perspectives were identified by establishing the different target domains related to the topic of climate change and by associating the narratives and scenarios which describe similar target domains. These perspectives emphasise the link between various narratives and scenarios to highlight their semantic contribution to the communication of climate change. The perspectives focus on the characteristics of the topic and on the metaphorical descriptions of these characteristics. These metaphorical descriptions are understood according to a particular perspective when they present these characteristics from a similar point of view: for example, the depiction of climate change

as a deterioration of nature is contrasted with a eulogistic depiction of the pre-industrial era.

Each of the following chapters illustrates a specific perspective: the eulogistic perspective on Nature, the deterioration of Nature, the emphasis on excessive pollution, and doom climatic predictions.

We analyse scenarios whose interpretation can be related to one of the four perspectives and associated narratives. For example, in our discussion of TRANSPORT scenarios (Chapter 7), we do not investigate the wider range of TRANSPORT-related metaphors in our corpus. Instead, we concentrate on a specific use of TRANSPORT-related metaphors which we can relate to doom predictions, i.e. scenarios about a TRANSPORT THAT IS CRASHING or a DANGEROUS JOURNEY/ DESTINATION (as opposed to an UNPROBLEMATIC JOURNEY with a PLEASANT TRANSPORT/DESTINATION). This delimitation can help us to answer our first research question about the use of scenarios and narratives in different genres.

In the remainder of this thesis, we analyse the use of the different narratives and associated scenarios identified in the four genres. Chapters 4, 5, 6, and 7 illustrate the ways the interpretation of narratives and scenarios varies in each genre and help us answer our first main research question. In Chapter 8, we rely on the distribution patterns of these narratives and scenarios to compare their use in each genre and to document their chronological evolution (answers to RQ2 and RQ3). The final section of this chapter establishes our methodology to observe these distribution patterns.

3.7. Distribution and chronological patterns: methodology

3.7.1. The relevance of distribution patterns via frequency of use

In the progress of this research, the number of data that were investigated helped us to identify a wide variety of scenarios. In Chapters 4, 5, 6, and 7, we discuss the interpretation of each scenario according to four main perspectives: the eulogy of nature,

the deterioration of nature, the materialisation of pollution, and the doom climatic predictions.

For this part of our research (Chapter 8), we composed a sub-corpus (see below) of 18, 656 newspaper (NEW) articles (average number of words per article: 714.051); 331 scientific (SCI) articles (average number of words per article: 1,712.178); 867 publications from *Friends of the Earth* (ENV/ average number of words per article: 621.323); and 44 political (POL) speeches (average number of word per speech: 208,245). This disparity can be perceived as a significant limitation of our research. However, this limitation did not prevent the identification of the various scenarios in the genres: we established the specific ways in which journalists, scientists, environmentalists, and politicians metaphorically discuss climate change.

This reduction resulted in the identification of 2,671 NEW scenarios, 342 SCI scenarios, 316 ENV scenarios, and 24 POL scenarios. The disparity of the number of scenarios within each genre can be explained by the different numbers of articles in each genre. The particularity of the genres (e.g., daily publications of press articles as opposed to more sporadic releases in the other genres) prevents any effective comparison across genres. Hence, we focus on the distribution patterns of scenarios to establish their relevance in each genre.

Our comparison relies on the frequency of use of scenarios and narratives and distinguishes their interpretation within each genre. We establish the salience of a scenario within a genre in terms of its frequency of use within that genre (i.e., its distribution in a genre as opposed to the distribution of other scenarios within this genre). The salience of a scenario in one genre is then compared with the salience of scenarios in the other genres. This comparison highlights a particular metaphorical focus which is specific to each genre. Our chronological analysis also highlights an interrelation between the yearly uses of a narrative in each of the four genres: the high frequency of use of a scenario during a specific period may be observed in different genres, which leads us to infer that this frequency is linked to a particular climatic event. Additionally, the evolution of a narrative establishes its lasting or delimited use. This evolution can then be related to climatic events which are metaphorically described in our corpus.

3.7.2. Reduction of our corpus

In chapters 4, 5, 6, and 7, we provide a detailed discussion about the variety of climate change narratives and scenarios in all genres. In Chapter 8, we focus on the distribution of these scenarios in each genre. We performed several reduction steps to determine this distribution which we describe in this section.

Firstly, we concentrate on a smaller version of our corpus. We need to focus on the use of scenarios within a more limited period to establish the chronological evolution of narratives in each genre. This period was determined between 2001 and 2017. This delimitation is justified by the particularities of the *Friends of the Earth* publications: their archives only give us access to a limited set of environmentalist publications whose earliest accessible publications date back to 2001. The establishment of a similar period of publications for each genre (2001-2017) provides ground still only for a limited cross-genre comparison. The study of narratives in articles published between 1984 and 2001 would have obscured our results because of the unavailability of environmentalist publication. However, the articles published during this earlier period are relevant to our analysis presented in Chapters 4, 5, 6, and 7 because these chapters discuss a wider variety of metaphors used when the specificities of climate change were not fully acknowledged by the population (e.g., before the findings of the first IPCC report which established the anthropogenic cause).

The smaller version of our corpus helps us to observe chronological tendencies of metaphorical uses in each genre. These tendencies highlight a relationship between the use of a scenario and a specific period or event related to climate change. The lower amount of SCI and ENV articles, and POL speeches (compared to the higher number of NEW articles) can yet indicate chronological similarities in the use of scenarios in these four genres.

Another particularity of our research has to be taken into account while discussing the distribution patterns of narratives and scenarios in the four genres. This particularity is related to the number of scenarios within each narrative or within a particular perspective. The different narratives rely on very different numbers of scenarios. For example, the materialisation of pollution as a FOOTPRINT only relies on the

metaphorical expression *footprint*, whose interpretation establishes different storylines (see Chapter 6). Contrastively, the (FUTURE) CLIMATE CHANGE AS A CRASHING TRANSPORT narrative relies on a variety of scenarios such as the BOAT, TRAIN, and PLANE scenarios (see Chapter 7). These different numbers of scenarios reflect the relevance of the respective narrative in climate change discourse. Therefore, the variety of scenarios within one narrative constitutes a relevant finding.

The variety of metaphorical items that compose each scenario as part of its interpretation in our corpus constitutes another particularity of our research. This particularity also has to be taken into account for the study of the distribution patterns. A metaphorical expression conveying a particular figurative meaning can occur several times within a single article. These repeated occurrences compose a similar scenario because they convey the same viewpoint on climate change across the article. In scientific communication, in particular, metaphorical expressions are often repeated in each article (see Appendix 2). The meaning of these metaphorical expressions was determined following scientific experiments and findings. Scientists use these repeated metaphorical expressions to identify the common features existing between a concept and the source domain of the metaphor. For example, the meaning of the CLIMATE CHANGE AS A FORCED INTERACTION scenario in *Nature* is determined by the element which produces this FORCING (e.g., the atmosphere, pollution, humans, and climate). The metaphorical interpretation is related to the findings discussed in each scientific article with some precisions regarding the different experiments/findings (e.g., NEGATIVE/ POSITIVE FORCING). These repeated metaphorical units in the article inform us about the relevant interpretation of the scenario (i.e., a scenario is not limited to a single expression): the FORCING scenario can be specified with the description of the RESPONSE TO THE FORCING. However, an article can be composed of a variety of scenarios pertaining to different narratives, in which case each scenario is isolated to be included in different narratives.

The frequencies discussed in Chapter 8 are all genre-specific: they represent the distribution of a scenario among all the scenarios used within a single genre. This type of frequency helps us to identify the salient scenarios in each genre.

The procedures depicted in this chapter yielded significant results that can be analysed to answer our three research questions. The comparison with the BNC contributes to the deduction of metaphorical interpretation, the identification of the features at play in a specific context, and the exploration of narratives and scenarios conveying a certain perspective on climate change. In the following chapters, these particular perspectives on climate change are discussed with attention paid to the narratives and scenarios which are related to them.

Chapter 4: Eulogistic perspective of (unaffected) nature

4.1. Introduction

One of the perspectives identified in our corpus presents a pleasant image of the environment. Narratives highlight this positive bias by emphasising the necessity of natural elements for human life. Some scenarios present a dramatic outlook according to which humans have to survive following the disappearance of natural resources. This distinction between the presence and absence of nature fulfils several argumentative functions: it accentuates the repercussion of climate change which modifies the environment – to the extent that its 'pleasant' quality is altered –, it pictures nature as a vital resource that humans have lost or are in the process of losing, and it defines a concrete motivation for actions by anticipating the possibility of recovering this resource.

The narratives we discuss in this chapter illustrate different pleasant aspects of nature. They focus on an equivocal initial state of nature, that is, a past or imaginary phase when climate change had no repercussion on the environment or when it did not occur at all. We begin the analysis of this perspective with the exploration of the qualities attributed by the UNAFFECTED ENVIRONMENT AS GREEN scenario. We discuss the narrative that qualifies THE EARTH AS A HOME for humanity. The idea of a HOME leads to the depiction of nature and humanity forming a FAMILY, living together and relying on each other (i.e., nature needs human protection and humans need natural resources). Humans' helplessness regarding the control of climate gives rise to the identification of nature as a higher authority. Metaphor users present this view through the narrative CLIMATE CHANGE AS A RELIGION: they describe an initial state of nature as the GARDEN OF EDEN which gradually becomes HELL. In other words, these scenarios highlight various aspects of the Earth as a pleasant place for humans to live in and the characterisation of climate change as a phenomenon which alters this pleasantness.

4.2. The "green and pleasant land" scenario

The observations from our corpus have established a relation between the colour adjective *green* and the environment. We focus on the characterisation of England, and, by extension, the United Kingdom, as a *green* space. This view fulfils different functions related to the positive bias communicated through the use of this adjective. We discuss the argumentation related to the positive features that compose the idea of GREENNESS.

The results of the BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "green", with the function *WordSketch*, reveal associations of the adjective and positively oriented descriptions of the nouns it qualifies. For instance, we observe associations such as "*green* and tranquil (nature)" or, when the meaning of the adjective is extended, economic recovery is perceived as "*green* shoots". Even in cases where the adjective qualifies a noun whose referent displays the colour green (e.g., grass), the discourse producers mention this colour to depict a positive picture of this referent (e.g., "bright, fresh, *green* grass").

These interpretations are relevant in our corpus. The metaphor users rely on the adjective *green* to present an idealised picture of (unaffected) nature which is suitable for human life. This process can be observed with the references in our corpus to William Blake's poem, *Jerusalem*[7], which conveys a picturesque description of England as a "green and pleasant land". This poem is considered to be a re-interpretation of the Bible adapted to the poet's social background (Kiralis 1956: 129; Volpone 2016: 11-2). This re-writing fulfils a social function (Frye 1951: 36): the "dark and satanic mills" in the poem refer to the rise of the Industrial Revolution which Blake opposed to "the green and pleasant land" on which Jesus is believed to have walked upon ("and did those feet in ancient time"; Rubin 2016). This re-interpretation focuses on redemption and forgiveness leading to peace (Kiralis 1956: 128-30; 132; Volpone 2016: 12-15). The poem became increasingly popular in England following its musical adaptation in 1916 by Sir Hubert Perry. It was used for the "Fight for Right" movement during the First World War to uplift the English people during that period. In 1917, it was used to support the National

[7] William Blake's poem is available at: http://www.bbc.co.uk/poetryseason/poems/jerusalem.shtml

Service for Women, and in 1918, it was sung during the suffrage demonstration and became the hymn of the Women Voters (Dibble 2016). Because of its historical impact, the poem has been called to become England's new national anthem since 1927 (Dibble 2016) which means that British readers are familiar with the lyrics. The stance of the poem (i.e., the reference to the Industrial Revolution) and its popularity are therefore suited for the depiction of a eulogistic view on nature in climate change discourse. An example of this is quoted below:

(1) POL - Since the Prime Minister claims such zeal for the protection of the environment, is she going to introduce new regulations to stop the development sprawl into the **green belt** in the south-east and elsewhere in Britain? (Applause) Is she going to stop Ridley's raiders spraying concrete over **this green and pleasant land**? 04/10/1988 Leader's speech, Neil Kinnock (Labour) Location: Blackpool

The passage from Neil Kinnock's speech comprises metaphorical and metonymical occurrences. The eulogy of nature is most perceptible in the reference to Blake's poem which produces a negative picture of human impact on nature. The phrase "Ridley's raiders" conveys a strong criticism addressed to the concomitant government. In 1988, Nicholas Ridley was the Secretary of State for the Environment for the Conservative Party. Despite this position, his decisions were perceived as non-environmentally-friendly because he campaigned in favour of a free-market economy which promotes a system that can be seen in opposition to the protection of the environment (Cosgrave 1993). Additionally, his involvement in the National Trust can explain his association with "raiders" in this passage if we consider the synchronous rise of the inflation and the cuts on public spending (Wheeler 2011). The distinction between human management of the land ("spraying concrete") and wild nature (i.e., nature that is not restrained by humans) highlights a contextual interpretation of the poem by Kinnock: the absence of human intervention is desirable because it would enable nature to have "green and pleasant" qualities. This resonates with the poem's stanza which presents the image of England as a Holy land yet to be "built" among "dark satanic mills". Hence, the distinction in the poem also appears in the political speech with a different stance. The resulting tribute to nature strengthens the criticism on urban policies.

This criticism is made more explicit with the reference to the *green belt* which refers to urban policies aiming at controlling urban extension to prevent the merging of urban areas, to preserve historic towns, and to promote development specific to each area (Ministry of Housing, Communities & Local Government 2012). In extract (1), the phrase focuses on urban areas in need to be controlled while preventing nature from exhibiting its pleasant resources ("new regulations to stop the development sprawl").

The two occurrences of *green* in the extract highlight an important pattern regarding its figurative interpretation: in *green belt*, the adjective is used as a metonymy identifying THE COLOUR OF THE ENVIRONMENT FOR THE ENVIRONMENT while the collocate *belt* is understood metaphorically and is unrelated to the metaphorical interpretation of GREENNESS, *green belt* describes the environment as a delimitation of urban areas. In the reference to Blake's poem, however, the metaphorical interpretation of GREENNESS is relevant because the adjective is not only used to describe the colour of the environment. It also ascribes positive features to this colour which qualify the environment ("pleasant").

Hence, the idea of GREENNESS applied to nature is part of the eulogy: following cultural and universal knowledge about the environment (i.e., green is the colour shared by various natural elements), the colour becomes one of the valuable aesthetic resources of nature and has an important argumentative role because it is the colour displayed by Blake's "divine creation" of nature. The association between GREENNESS and "pleasant" nature is not exclusively attached to Blake's poem. The adjective *green* in our corpus also provides a picture of *green* nature as desirable, as below:

> (2) NEW - Airlines ready for a **dogfight** over EU's plan for **cleaner, greener skies**: Lufthansa leads the way in lobby of MEPs as they vote on a controversial scheme. *The Guardian* July 4, 2006 Tuesday BYLINE: Hans Kundnani and David Gow

In extract (2), GREENNESS is conceived as an ensemble of human actions to protect the environment. The adjective (here, in its comparative form) qualifies a natural element ("skies") characterised by its need for environmental protection. This characterisation indicates that the absence of human impact on the sky is perceived as an ideal condition ("*greener* skies"), according to EU's plan. The meaning of the adjective differs from Blake's poem because here, *green* is not used as the exemplary colour of "pleasant"

environment but as a colour representing the need to control human alteration. This meaning is emphasised through the adjective *clean* which involves a removal of unpleasant features, displaying a picture of pollution as DIRT. The comparative forms of the adjectives highlight an optimistic view on climate change which is conceived of as an entity that can be removed.

This view is debated by the journalists who describe the opposition of airlines to EU's plan. This opposition questions the "pleasant" characteristics of "*greener* skies" because these characteristics do not benefit airlines which are *dogfighting* over the plan. Hence, this extract shows that the pleasant characteristics of GREENNESS can be questioned depending on authorial stance. This questioning also occurs in descriptions of *greenwashing*, as below:

> (3) ENV - It is now very hard to find any large companies that would not claim to be striving to reduce their environmental impact. Those that are sincere about sustainability have nothing to fear from our proposals, and everything to gain. They will surely welcome action being taken against those competitors who are not concerned about their social and environmental impacts. But our experience shows many corporations are really engaged in "**greenwash**" (ie PR exercises designed to boost their **green image**, without any change to their core activities). *Friends of the Earth*. Don't let big business rule the world: Friends of the Earth International launches global campaign for Earth Summit 01 June, 2002

Extract (3) questions the meaning of *green*. The noun *greenwash* refers to the manipulative use of elements which the colour stands for by some corporations to pretend that their productions respect the environment (Pérez-Sobrino 2013). They rely on the appealing quality of the idea of GREENNESS to attract customers while the environmental impact of their production does not fit such a characterisation. Pérez-Sobrino (2013:68-9) shows that *greenwash* is related to *whitewash* which designates an element used to conceal a fault so that the product looks estimable (according to the OED, definitions 3.a.b.c.). In this extract, environmentalists characterise the colour *green* as an estimable feature, which is attributed to the environment. The component "-wash" resonates with preceding interpretations of the conceptualisation GREEN AS CLEAN (extract 2). The protection of the environment is conceived as an appealing quality (i.e., *green* and clean/pleasant) which does not correspond to the qualities of the corporations. This criticism is reinforced by the second occurrence, "*green* image", which emphasises

that the colour only prevails as a communicative tool ("image") but not as a characteristic of environmental actions performed by corporations.

The environmentalists present an unfavourable picture of corporations: they first distinguish the corporations which favour sustainability from "competitors" who are "not concerned" with the environment. They focus on environmentally-friendly corporations and define these corporations' stance as a "*green* image". Hence, *Friends of the Earth* use the adjective *green* to criticise all corporations discarding specific environmental stances.

The argumentative use of *green* is a significant feature of political speeches about climate change considering the appellation "*Green* Party" which defines political affiliation to a party involved in the protection of the environment and "*green* policies" which delimits a group of environmental decisions among other decisions taken by a Party (see Augé 2019b). In the following sub-chapters, we see that the eulogy of nature can be depicted through further narratives identified in our corpus.

4.3. The HOME-FAMILY narrative: Earth as a HOME and Humans - Nature FAMILY as its INHABITANTS

4.3.1. THE EARTH AS A HOME scenario

The idea of "green and pleasant land" extends the depiction of nature as beneficial to the whole world. While Blake's poem focuses on England (and its adaptation in climate change discourse focuses on the UK) as an ideal vision of the New Jerusalem, metaphor users also define nature as a common good which provides resources necessary for human survival. They characterise the Earth according to its unique capacity to host life. The Earth is metaphorically perceived as a SHARED HOME which emphasises common responsibilities for keeping the HOME fitted for human life, and every human is identified as its INHABITANT. Picturing the Earth as a human habitat helps the metaphor users to adopt a global view regarding climate change which threatens to damage this SHARED HOME whose potential destruction would make its INHABITANTS

HOMELESS. The HOME-FAMILY narrative involves a domestication process (Olausson 2009: 422; Brown, Budd, Bell & Rendell 2011: 664-5) because this conceptualisation helps to understand a global event as an event that can happen in everyone's respective home (e.g., a dirty house that needs to be cleaned representing a polluted planet; this interpretation has been acknowledged in Kövecses' discussion of COMPLEX SYSTEMS ARE BUILDINGS, 2010: 136-40). The conceptualisation also creates a closer link between humans and the planet. The HOME-FAMILY narrative is part of the eulogy of nature because it qualifies a place that is pleasant and suited for humans' daily life (e.g., as opposed to a workplace which can present more negative features). The features of the HOME concept fit the eulogy. While the HOUSE concept involves connotations about "mastery and control", the HOME concept produces "strong positive emotional response" (Charteris-Black 2004:99).

The results provided by the BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "home" reinforce this perception through positively-oriented collocates such as "family", "holiday", "ownership", "help", and contextual uses that emphasise humans' need to live in a home, like in "the protection of *home* and family" (token number: JY7 - 4881576).

The global feature of the source domain HOME has also been identified in political debates about Europe (Musolff 2004a) with a distinction between the concepts of HOME and HOUSE in the interpretation of the scenarios. These scenarios help politicians to refer to Europe as a HOUSE AS A PLACE WHERE PEOPLE LIVE TOGETHER as opposed to the EU HOUSE AS A PLACE FROM WHICH PEOPLE ARE EXCLUDED (2004a: 126). Overall, picturing Europe as a HOUSE aims at "promoting a collaborative way of living together" (2004a:127).

While the depiction of EUROPE AS A HOUSE involves political decisions (i.e., the creation of a new HOUSE), the EARTH AS A HOME scenario in our corpus depicts the alteration of the environment which forms the HOME of humanity. The features highlighted by the scenario define a HOME as a place which contains the resources necessary for humans' everyday life, as in:

> (4) NEW - The devastating rains have already started to fall and we have very little time left to build a proper **roof** to protect **our national home** from the devastating damage of global warming and the hurricanes and flooding it brings. *mirror.co.uk* December 8, 2015 Tuesday Tackle the floods before it's too late BYLINE: Alison Phillips
>
> (5) ENV - "We are bitterly angry that the OPEC countries, Japan and the United States have combined in this way to help wreck **the world's environment and endanger the security of our common home**. (…)" Kate Hampton, Climate Campaigner for Friends of the Earth International. *Friends of the Earth.* Earth Summit dumps on climate 02 September, 2002

In both extracts, the concept of HOME is depicted in relation to human life ("our") which draws a link between environmental damages and the danger faced by humans.

In (4), the journalist focuses on the UK AS A HOME: the attention is on the impacts of weather events, which are specific to delimited geographical areas. These impacts highlight the need for protection which is represented by the ROOF OF THE NATIONAL HOME. The concept ROOF has been selected by the journalist from a range of possible protective features (e.g., FLOOR, WALLS) because the damaging elements (i.e., "devastating damage of global warming") are cited as an exemplary consequence of climate change which "falls" on the ROOFLESS HOME. "Hurricanes" and "flooding" are mentioned as climatic manifestations damaging the HOME. The environment is not itself perceived as a HOME but as an external element damaging the country ("national *home*"). The journalist identifies the British population as the INHABITANTS OF THE HOME who are missing protection because they are living in a ROOFLESS HOME. The ROOF is used as a concrete element of the HOME to represent urgent actions needed for the security of INHABITANTS.

In (5), *Friends of the Earth* link environmental threats to the SECURITY OF THE HOME. The focus is on the necessity for every human to live within a HOME to survive. However, the positive features conveyed by the EARTH AS A HOME scenario are questioned by the differentiation of the INHABITANTS OF THE HOME. The characterisation of the HOME as COMMUNAL helps the speaker, Kate Hampton, to emphasise the negative effects of the "Action Plan" deal which does not involve any target for the use of renewable energy. This decision is related to the potential danger it involves, affecting the whole world. The description of the planet as a SHARED HOME

is a way for the environmentalist to metaphorically reduce the distance between different populations: she pictures them as being part of a SHARED HOME which gives rise to images of BAD INHABITANTS OF THE SHARED HOME (i.e., Organisation of the Petroleum Exporting Countries) whose decisions have negative consequences for ALL INHABITANTS OF THE HOME. In other words, the metaphorical shrinkage of the planet into a HOME emphasises the effects of particular decisions taken by particular countries.

In both cases, the UK/EARTH AS A HOME scenario highlights a link between humans and the place they live in with a relation of possession and characteristics that coincide with characteristics of human life within the HOME. This link can be questioned in different versions of the narrative, as in:

> (6) POL - The core of Tory philosophy and the case for protecting the environment are the same. No generation has a freehold on this earth. All we have is **a life tenancy with a full repairing lease**. And this Government intends to meet the terms of that **lease in full**. 14/10/1988 Leader's speech, Brighton, Margaret Thatcher (Conservative)

The TENANCY source domain specifies THE EARTH AS A HOME scenario which becomes a HOME THAT NEEDS TO BE KEPT CLEAN AND IN GOOD REPAIR. The characterisation of the INHABITANTS having to share a space is extended to include FUTURE INHABITANTS. Human lifetime is perceived as the duration of the TENANCY CONTRACT which includes "full repairing lease": the HOME is presented as a commodity that the current generation will hand over to the next one. The former UK Prime Minister, Margaret Thatcher, highlights the DUTIES comprised within the concept of a SHARED TENANCY involving REPARATION and CLEANING so that FUTURE INHABITANTS can enjoy the resources provided by the environment. This conceptualisation is emphasised in the last sentence describing the goal of the government to "meet the terms of that lease in full": on the one hand, this shows the extent of the actions the government wants to perform (i.e., leaving the place intact) and, on the other hand, it acknowledges that humans can damage the place ("full repairing lease") and consequently have to REPAIR elements that compose the HOME.

This extract conveys a negative picture of pollution which is implicitly perceived as DIRT or BROKEN OBJECTS. The argument derived from this conceptualisation

presents climate actions as a DUTY: the audience is called to CLEAN THE HOME not because they aim at living in a pleasant place but because they are under the terms of a CONTRACT which, if not met, will have negative consequences (e.g., paying fees).

Another implicit argument is about the familial responsibility: the FUTURE INHABITANTS can be identified as the audience's children ("No generation has a freehold on this earth"). Therefore, the politician presents the need to REPAIR the HOME as a mark of respect for family members who are expected to live within the same HOME: the care for the planet is associated with the care for FAMILY.

4.3.2. The human FAMILY and Nature's FAMILY scenario

The HOME-FAMILY narrative depicts a relationship of interdependence in terms of natural elements and humanity forming a FAMILY. The FAMILY source domain relies on the image of the Earth as a SHARED HOME: according to the results of the BNC, the concept of "home" is frequently associated with the concept of "family". In our corpus, this association is conveyed through a scenario picturing humanity as a FAMILY, as in:

> (7) NEW - In the Kyoto **family** of nations, Europe and the developing countries may be seen as **dependants, pensioners and minors**; the US **as the breadwinner and protector - who is being urged to leave his car in his garage, and to walk to work or to get on his bike**. *The Times* April 20, 2001, Friday Unravelling complex concerns over climate change, Lucas Mellinger

This extract focuses on the idea of interdependence between humans as the INHABITANTS OF THE SHARED HOME. The view on the environment forming a HOME is downplayed to focus on the characteristics of human life within the same shared space. The idea of interdependence and SHARED HOME are emphasised with the identification of countries as FAMILY MEMBERS.

In (7), the INTERNATIONAL FAMILY is characterised by the involvement of each country in climate actions during political meetings (i.e., The Kyoto Protocol). The HUMANITY AS A FAMILY scenario identifies Europe and developing countries as CHILDREN and the US as a PARENT. This hierarchy establishes a dependence of the

CHILDREN upon the decisions taken by the US. The FAMILY is characterised according to an economic viewpoint. The US as a PARENT is depicted according to its commitments to FEED and PROTECT its CHILDREN who are able to live thanks to the PARENT'S REVENUE ("work").

This hierarchy has an effective argumentative purpose since the journalist uses it to highlight the paradoxical behaviour of the CHILDREN who are asking the PARENT to make more efforts for preserving the environment ("to leave *his* car in *his* garage, and to walk to work or to get on *his* bike") and to earn money to FEED/PROTECT them ("breadwinner and protector"). The journalist perceives the Kyoto Protocol as an injustice towards the US while Europe and developing countries are pictured as UNGRATEFUL CHILDREN relying entirely on their PARENT and asking him for even more actions.

The FAMILY source domain can also apply to natural resources. The attribution of human characteristics to natural elements emphasises the picture of NATURE AS A FAMILY, especially in articles which focus on the interconnection between natural resources. This is exemplified by the extract below:

> (8) SCI - Epstein is a pioneer in this field, one of a handful of medical graduates who, in the early 1990s, focused on the emerging links between climate change and human health. (…) In an excellent exposition, he discusses environmental microbiologist Rita Colwell's discovery in the 1990s of how algal blooms in warm waters **nurture** cholera bacteria, which then enter the marine food chain and, eventually, human consumers. *Nature* volume472, pages292–293 (21 April 2011) Climate change: A dose of reality Tony McMichael

In (8), the characterisation of NATURE AS A NURTURING PARENT is used by the scientist to picture the effect of climate change on water which allows the production of the cholera bacteria (according to existing scientific findings). This leads to the conceptualisation of algal blooms as the PARENTS of the bacteria, following the patterns imposed by climate change and warm water. The positive features of the NATURE AS A FAMILY scenario are contrasted by the detrimental characteristics of the entity that is NURTURED. The scientist uses the scenario to illustrate the spoilage produced by the interaction of climate change and natural resources, according to Rita Colwell's findings. The NATURE AS A FAMILY scenario pictures the long-term process enabling the existence of the bacteria. The argument relies on the image of the association

between the effects of climate change, warm water, and algal blooms without which the bacteria would not exist, in the same way that a CHILD would not live without PARENTS.

The narrative can involve humans and nature who are pictured as part of the same FAMILY, as in:

> (9) NEW - As a group, some concerned mothers - myself among them- are coming together with their children this week because we want to leave our planet in much the same way as it was when we were born: rich, varied and able to support and **feed us all**. *The Guardian* May 20, 2008 Tuesday The war to end all wars: The climate change threat needs drastic action. BYLINE: Rosie Boycott

The future of the planet in (9) is described through the scenario HUMANITY AND NATURE AS A FAMILY: the journalist refers to a distant future which the current generation will not experience. Here, the "mothers" and "children" are not metaphorical occurrences. The journalist's emphasis on the familial bonds linked to the threat of climate change shows that the argument promoted by the depiction of nature as a FAMILY MEMBER has become prevalent regarding people's concerns about the impact of the phenomenon on their own family. This comparison between humans' future (with references to humans' children) and the planet's future ("leave our planet") establishes an indirect metaphorical link between humans and the planet conceptualised through the idea of FAMILY.

The FAMILY does not only include humans but also the planet, defined as another FAMILY MEMBER ("*feed* us all"). This latter view has been discussed by Nerlich, Koteyko and Brown (2010:104) who identify AGEING metaphors in a variety of climate change discourses: the impossibility of predicting the age of death of a person is compared to the impossibility of predicting the evolution of climate change (2010:104). Extract (9) presents a FAMILY picture which implicitly links children's future to the planet's future. This view involves mothers worrying about the future of their children because of the environmental threat ("the war to end all wars"; see Chapter 7). The journalist focuses on mothers who aim at convincing the population to care for the planet in the same way they care for their children.

In the end of the extract, the journalist attributes human characteristics to the Earth: the Earth is *feeding* humans, this description identifies it as a NURTURING PARENT (see Lakoff 2004). This provides an additional argument about humans' inability to feed themselves, qualifying them as the CHILDREN of the Earth. The FAMILY scenario is part of the eulogy of nature because it establishes an emotional view that links humans, natural resources, and the environment.

4.3.3. MOTHER EARTH/ NATURE scenario

We can trace the origins of the phrase *Mother Nature/ Earth* back to ancient beliefs. For example, the EARTH/NATURE AS A MOTHER scenario can be related to the story of Gaia, Goddess of the Earth (Grant & Hazel 2002; Latour 2017: 61; *Encyclopaedia Britannica* and *Columbia Encyclopaedia* entries for "Gaea"). According to Hesiod, she was worshipped as a mother goddess, the giver of dreams and the nourisher of plants and young children (*Encyclopaedia Britannica* and *Columbia Encyclopaedia* entries for "Gaea"). Her children the Sky (Uranus) and the Sea (Pontus; among others) characterise her as a mother (*Encyclopaedia Britannica* entry for "Hesiod"; *Columbia Encyclopaedia* entry for "Gaea"). Her status and functions as a Goddess have been recounted by the Greeks to explain natural events (Comstock no date). Meiggs (1972: 291-305) finds historical evidence that Greek invasions established the Greek supremacy over the colonies by imposing beliefs and rituals. Other stories about mother goddesses of the Earth can be observed in Amerindian cultures, which may also be relevant to interpret the metaphorical phrase in our corpus. These communities attribute a dominant role to the mothers following specific narratives which account for the sacred power attributed to the mothers as the "guardians of nature" (Jenkins 2015: 451). Aboriginal beliefs originate in a variety of stories that are specific to each community. Among these narratives, we can note, for example, the story of Sky Woman in the Haudenosaunee community which describes a female sacred entity who, after getting pregnant, falls on earth and gives birth to a daughter with whom she creates lands and all creatures on the planet (Sellers 2014: 197; see also Augé 2019a).

The PARENT source domain has been discussed by Lakoff (2004) who identifies the conceptual metaphor NATION AS A FAMILY in US political ideologies. The metaphor involves two opposing frames: the STRICT FATHER and the NURTURING PARENT (2004: 10; 39-40). The PARENTING roles are viewed through the scopes of PROTECTION or REPRIMAND of the CHILDREN. Musolff (2004a: 9-29; 2016a: 26-37) extends the concept of FAMILY to discuss a different target domain, European politics as LOVE-MARRIAGE-FAMILY (2004a: 13) in political debates about Europe. Such debates present a variety of FAMILY-related mini-narratives (2004a: 17) such as PARENTS-CHILD relationships, MARRIED LIFE of the EU couple, and LOVE/MARRIAGE relationships between Britain and the EU (2016a: 31-2).

The conceptualisation of NATION AS A FAMILY relies on particular expectations conveyed by the source domain which involves "solidarity and mutual responsibility" (Musolff 2004a: 29). Following this interpretation, the use of FAMILY-related source domains in the climate change descriptions included in our corpus seems to fulfil similar argumentative trends. Particularly, picturing nature as a MOTHER involves descriptions of human behaviour towards the environment, as in:

> (10) ENV - Prakash Sharma, Director of Pro Public (Friends of the Earth Nepal) said: "Mount Everest is a powerful symbol of the natural world, not just in Nepal. If this mountain is threatened by climate change, then we know the situation is deadly serious. If we fail to act, we are failing future generations and denying them the chance to **enjoy the beauty of mother earth**. I urge the committee to place Sagarmatha National Park on the danger list." *Friends of the Earth*. Everest must be put on a danger list 11 July 2005

The EARTH AS A MOTHER scenario presents a positive picture of nature which focuses on human dependence on its resources. The parallel with climate change highlights the risk to lose the resources which facilitate human life. These resources are grouped by their common environmental characteristics which enables the metaphor users to define them as a single living entity: MOTHER EARTH/NATURE.

In (10), the description of MOTHER EARTH focuses on prevention, picturing climate change-related events as affecting MOTHER EARTH'S BEAUTY. *Friends of the Earth* adopt an argumentative strategy which emphasises the pleasant image of unaffected nature (i.e., Mount Everest) which may disappear because of climate change. This image is persuasive because of the scenario: the current generation has been able to

benefit from the MOTHER'S BEAUTY; however, the next generation may be denied such benefits (i.e., Mount Everest may disappear). The evolution of climate change is pictured as a BEAUTIFUL MOTHER who turns into a MOTHER who has lost her beautiful attributes. The MOTHER'S BEAUTY is an enjoyable resource which may not be accessible to humanity in the future. The scenario aims at convincing decision-makers to protect nature, and Mount Everest, in particular.

In different cases, the positive attributes of the MOTHER are presented as potentially affected by her CHILDREN's MISBEHAVIOUR forcing the MOTHER to react and REPRIMAND their foolish actions. This interpretation contrasts with the expectations of the identification of THE EARTH AS A MOTHER.

The link between the phrase *Mother Earth/Nature* and mother goddesses of the Earth is grounded in the shared nourishing and nurturing attributes, as discussed above. However, we can find additional representations of the MOTHER'S parenting behaviour in the remnants of the goddesses' stories. In Greek mythology, the descriptions of Gaia develop into stories of vengeance over her son, Uranus. In the course of this myth, he became Gaia's husband, and after their union, he grew jealous of their own children whom he consequently imprisoned. Gaia's response was to plan a revenge with one of her sons, Kronos who castrated Uranus following his mischief (Grant & Hazel 2002; *Encyclopaedia Britannica*, entry for "Greek Mythology"; *Columbia Encyclopaedia*, entry for "Gaea"). Similarly, the Sky Woman's story adopts a more violent turn following colonisation which threatened women's position in society (Lavell-Harvard & Anderson 2014: 3-5). This violent turn in Sky Woman's story allowed women of these communities to resist the social construction imposed by colonisers (Sellers 2014: 198; see also Augé 2019a). This version of the story varies among the different communities affected by colonisation and a wide (but non exhaustive) variety of stories about Sky Woman can be observed in existing literature (Lavell-Harvard & Anderson 2014; Sellers 2014).

This possible characterisation of the MOTHER is not acknowledged in Lakoff's analysis of the NURTURING PARENT frame (2004). However, in our corpus, metaphor users highlight the revenging attributes of the MOTHER, which can be compared with related plots of the goddesses' stories. In such cases, climate change is identified as the MOTHER'S PUNISHMENT, as in:

> (11) NEW - If Florida gleaned anything from Hurricane Andrew, the intensely powerful storm that tore a deadly trail of destruction across Miami-Dade County almost exactly 25 years to the day that Hurricane Harvey barrelled into the Texas coastline, it was that living in areas **exposed to the wrath of Mother Nature** can come at a substantial cost. *The Guardian* August 29, 2017 Tuesday How Harvey - and climate change - could change American real estate BYLINE: Richard Luscombe

In (11), the conceptualisation of the STRICT FATHER established by Lakoff (2004) is adjusted to identify a STRICT MOTHER. This gender transition might have been influenced by argumentative choices which depict NATURE AS A MOTHER whose authority is not respected, forcing her to adopt the role of the STRICT MOTHER. We can also trace the transition back to the intrinsic link that exists between the phrase *Mother Nature* and the beliefs about mother goddesses of the Earth: the STRICT MOTHER is characterised by her ANGER.

In (11), the journalist focuses on this ANGER but does not explicitly mention the cause. This ANGER is conceptualised as a link, established by the journalist, between Hurricane Andrew and Hurricane Harvey. Both events are described as resulting from MOTHER NATURE'S WRATH. However, the journalist leaves the STRICT MOTHER'S ANGER unexplained. Additionally, her WRATH only affects some areas ("areas exposed to the *wrath*") which indicates that the manifestation of her ANGER is not directed at specific places (use of the passive form "exposed"). These aspects characterise the unpredictability of such manifestations and emphasise the threatening characteristics of the MOTHER. In the title of the article, the journalist highlights the upcoming REPRIMAND from MOTHER NATURE by linking her ANGER and climate change as the causes of hurricanes.

MOTHER NATURE'S AUTHORITY can be perceived as a greater threat, in descriptions of the MOTHER as a GODDESS, as in:

> (12) SCI - This argument leads him (Prof. Brian Fagan) to conclude that: "the present problem of global warming is neither proof of late capitalism's intent to commit **industrial-strength sins against Mother Earth** nor a hallucination imposed on the world by anti-business activists. It is simply a reflection of the scale of our vulnerability, the scale on which we must now think and act." *Nature* volume429, pages25–26 (06 May 2004) Warming to a historical theme Jeremy A. Sabloff (my addition in parenthesis)

In (12), Brian Fagan describes MOTHER EARTH as a GODDESS against whom SINS may be committed, which draws a link with the mother goddesses of the Earth. He pictures industrial pollution as SINS perpetuated against the MOTHER. However, he denies this religious understanding of climate change by emphasising the responsibility of the population. The main argument highlighted by the scenario NATURE AS A MOTHER GODDESS is that humans overlook their own "vulnerability" at their own risk.

We can also interpret the EARTH/NATURE AS A MOTHER GODDESS scenario with reference to James Lovelock's Gaia theory, which links Greek mythology and the metaphorical expression *Mother Earth/Nature*. The references in our corpus provide additional features to Nature as a LIVING ENTITY who instigates fear and submission of humanity. Lovelock's work re-interprets the myth of Gaia and adapts it to the observations of nature. According to his theory, elaborated since the early 1970s (Donahue 2010: 55-6), nature is represented as a system of interactions between species, organisms, and the environment. These interactions create a single living entity characterised by its indivisibility: Gaia (Kirchner 2002: 392; Donahue 2010: 52; Ogle 2010: 275-7; 283). This theory provides a particular view on human life on earth: human control of nature is opposed to Gaia's (or the Earth system) self-regulation which leads Lovelock to call for the preservation of "emotional bonds to Gaia" (Ogle 2010: 280) and to pay attention to the benefits of natural resources (Donahue 2010: 54; 56-7; Ogle 2010: 277; 289). His work has had a significant impact on science because it raised new questions and hypotheses about the influence of humans on the climate (Donahue 2010: 53-4; Ogle 2010: 276-8). In our corpus, we observe references to the goddess Gaia to discuss environmental protection, as in:

> (13) NEW - Let us not dwell on such miseries though, for we would only end up doing what so many greens would prefer us to do and kill ourselves - **thus sparing Mother Gaia the hideous indignity of our defiling presence in her sacred bio-temple**. *telegraph.co.uk* June 16, 2009 Tuesday Now even Moonbat has surrendered on global warming why can't Barry Obama? BYLINE: James Delingpole

In (13), the journalist establishes the ideology of "many greens" and criticises their stance with reference to Gaia as a living entity characterised by its powers over humanity and who needs to be feared (consistent with mythological accounts and James Lovelock's

theory). According to "the greens' view", pollution and consequent damages to the environment are pictured as MISBEHAVIOUR against Gaia. The Earth is not HUMANS' HOME but GAIA'S HOME in which humans are INTRUDERS. Consequently, climatic effects are accentuated with the mythological connection: the HOME becomes a SACRED TEMPLE which comprises SACRED ENTITIES.

The journalist relies on this scenario to convey a sarcastic view on the environmentalist stance. He mocks "the greens' view" on nature by exaggerating their respect for the environment. This exaggeration is established with the personification "Mother Gaia" depicted as GODDESS. Additional criticism is fulfilled through the picture of environmental damages which are caused by the sole existence of humans ("our defiling presence"). This interpretation allows the journalist to mock environmentalists by noting that the solution is to "kill ourselves". He distinguishes "the greens" from the rest of humanity (which potentially includes the readership, "ourselves") describing the deceit of the environmentalist stance which identifies activists as the only humans who deserve to live in the TEMPLE.

Overall, the references to Gaia rely on values and beliefs that Nature is a living entity that has been ATTACKED which can lead to positive pictures of the environment but also to criticism about the powers attributed to nature by environmentalists.

4.4. The CLIMATE CHANGE AS A RELIGION narrative: Opposition between UNAFFECTED EARTH AS THE GARDEN OF EDEN and AFFECTED EARTH AS HELL

The reliance on the Gaia theory in climate change discourse gives rise to a broader approach using the characteristics of religion to describe human submission to Nature. This conceptualisation enables metaphor users to emphasise the eulogy with references to *the Garden of Eden*, which is cited as an exemplary place that has not been altered by the presence of humans. The religious coinage of the phrase establishes this immaculate characteristic as pleasant because it corresponds to a divine creation opposing the idea of fulfilment and prolific agriculture to a ground whose yields depends on hard labour

(where Adam and Eve were sent after being banished from Eden; Genesis 2:4-3:24, New International Version). The references to *Eden* in climate change discourse picture the past pre-industrial era. Therefore, metaphor users define the immaculate quality of the land by the absence of gas rather than the absence of humans, as in:

> (14) NEW - If there was **a golden age** for humans on the Earth - **a Garden of Eden that flowed with milk and honey** - it was the high point of the I Holocene, the era that followed the end of the last ice age. *The Independent* June 5, 2006 Monday Welcome to our future; Why deserts will inherit the Earth Few places on Earth are less hospitable, less suited to human life than the Sahara desert. BYLINE: Fred Pearce

> (15) POL - In the past, science has solved many of the problems which at the time seemed quite insuperable. It can do so again. We are far too sensible to think that in 1988 we can **turn the clock back to a pre-industrial world where Adam delved and Eve span. The Garden of Eden had a population of two.** Our world has a population of five billion going on six. 14/10/1988 Leader's speech, Brighton, Margaret Thatcher (Conservative)

In examples (14) and (15), the past pre-industrial period is perceived through the range of environmental resources that were not yet affected by climate change. The metaphor users emphasise the prolific quality of nature which enabled humans to have access to vital resources.

In (14), the journalist describes these resources in terms of human pleasure ("milk and honey") adding to the picturesque description of an environment that is not only vital but also pleasant, favouring humans' happiness. The phrase "milk and honey" is a quotation from the Bible which describes the Promised Land and characterises it as a blessed land. The "milk and honey" symbolise luxury items, both healthful and pleasurable. Both products emerge from uncultivated areas which means that, in this blessed area, even the lands unsuitable for agriculture are profitable to humans. The phrase represents an idealised agricultural landscape (Levine 2000). The "golden age" is not directly linked to the prosperity of the environment but to the suitability of the environment for human life. The phrase emerges from Hesiod who establishes Four Ages: the Golden, the Silver, the Bronze, and the Iron Ages. While the three latter Ages are associated with death, violence, and moral decline, the Golden Age represents prosperity characterised by "jollity and feasting" (*Encyclopaedia Britannica*, entry for "Greek Mythology"). Here, these biblical references are used to define an idealised past era, the I Holocene, which accentuates the dissimilarities with the present-day era in which

humans evolve. Charteris Black (2019:315) notes that references to the "golden age" in British discourses from the 1960s onwards mark a rejection of social and cultural changes and convey nostalgic feelings about past characteristics of society (2019:315). This interpretation can be applied to climate change discourse in which the reference depicts a past period characterised by the availability of natural resources and beneficial temperatures.

In (15), Margaret Thatcher presents a nostalgic view on the pre-industrial era ("turn the clock back") which is presented in a way that almost looks like a utopia because of the mapping involving the "pre-industrial world" and "Adam and Eve". This mapping produces an alternative picture which is unrelated to the real world nor to religion. It depicts an era characterised by its pre-industrial aspects (i.e., absence of gas) and by its "original" human inhabitants, the first woman and the first man, according to religious beliefs (Genesis 2:4-3:24 New International Version). The former UK Prime Minister describes the evolution of humankind in terms of population increase. Margaret Thatcher quotes an English priest and social reformer, John Ball. He used the verse "When Adam delved and Eve span/ Who was then the gentleman?" during the Peasant's Revolt in 1381 of which he was one of the instigators (*Columbia Encyclopaedia*, entry for "John Ball"). This revolt resulted from the plague of 1348-9 which promoted Parliamentary decisions to hold down peasants' wages and raise taxes (*Columbia Encyclopaedia*, entry for "Wat Tyler"). This reference to Adam and Eve pictures their life after their banishment from Eden, when they had to perform labour to enjoy the resources of the ground. This passage from the Bible has been acknowledged for its application during more contemporary social struggles to assimilate Adam and Eve's labour to people's working conditions (Wyatt 1988). Here, the politician resorts to this passage to illustrate agricultural (manual) techniques exempt from pollution which occurred prior the development of industries. The related ideology justifies the alteration of Nature as it is linked to the evolution of humankind. Industries are pictured as being necessary for the survival of an extended number of humans.

The use of the RELIGION narrative in climate change discourse has been discussed by Atanasova & Koteyko (2017a). They identify the sceptical stance of such metaphorical expressions in the Opinion pages of the *Mail Online* and find that religious

expressions in climate change argumentation are used to denigrate science and de-legitimise initiatives through phrases such as *carbon indulgence* or mappings such as ACTIVISTS AS EXTREMISTS. Journalists can promote individual opposition as part of one's civil liberties (2017a: 454-465). Nerlich (2010) highlights the persuasive role of religious references in communication about the "Climategate" scandal (see Chapter 2, section 2.6.2.) which describe science as "untrue" and belief in science as dangerous, presenting scepticism as a safe option (2010:8-13).

In our corpus, the reliance on CLIMATE CHANGE AS A RELIGION narrative to question the existence of the phenomenon or related political decisions can be compared to the results presented in existing literature. This is exemplified by the extracts below:

> (16) NEW - After years of steadfastly resisting the insistent demands of the climate alarmists, of bravely ignoring the ridicule of the world's media elites, Mr Bush was finally caving in. The talk from officials in Washington was all about the global scientific consensus on the need to reduce carbon emissions, about the need for international agreements. (…) Fortunately, as the rest of the world quickly discovered to its horror, it took only a slightly more detailed perusal of the speech than Ambassador Gray had obviously given it to realise that this great capitulation by the United States was nothing of the sort. Mr Bush was not, after all, **kneeling at the altar of the Church** of Environmentally Aware Correctness and asking to be **baptised** anew in the **healing waters** of Kyoto-style targets and carbon emissions caps. *The Times* June 5, 2007, Tuesday On climate change, Bush is all heart BYLINE: Gerard Baker

> (17) ENV - "People all over the world are protesting against corporate globalization - but governments continue to **sacrifice** the Earth Summit on the **altar** of Exxon, Monsanto and co" said Daniel Mittler Earth Summit Coordinator for Friends of the Earth. *Friends of the Earth*. Earth Summit is sinking: NGOs warn Kofi Annan 31 May, 2002

In (16), the journalist describes the former US President's stance on the environment. He uses CLIMATE CHANGE AS A RELIGION narrative to depict the politician's lack of interest in the issue ("Mr Bush was not, after, *kneeling at the altar of the Church* of Environmentally Aware Correctness"). Expectations about his political involvement in environmental decisions are pictured as a form of RELIGIOUS BIGOTRY to mock the politician's pretence of environmental concerns. The sarcastic tone involved in the use of

this scenario is also evidenced in the metaphorical representation of political submissiveness which pictures the politician KNEELING AT THE ALTAR. This produces an exaggerated view on the importance of the (climate change) CHURCH for the former US President who is described as physically docile (KNEELING) and economically servile (ALTAR). The sarcasm presented in this extract is even more transparent through the use of the BAPTISM and HEALING WATERS scenario extensions, illustrating the politician's ignorance about climate change actions. This scenario version aims at mocking Mr Bush's pretence regarding environmental concern related to the US involvement in international agreements.

The CLIMATE CHANGE AS A RELIGION narrative can also be used in counter arguments. In (17), *Friends of the Earth* use the SACRIFICE scenario to describe the endangerment of decisions agreed during the Earth Summit. The scenario criticises the authority of industries (i.e., ALTAR of Exxon) on whom governments are relying. The environmental decisions of the Earth Summit are perceived through two opposing stances: governments SACRIFICE them to favour industry while *Friends of the Earth* focus on the need to preserve them. The submission of governments is perceived as promoting climate change (following industrial AUTHORITY) while in extract (16) this submission is ironically perceived as promoting *green* political pretence.

The destructions caused by climate change events promote views which contradict the picture of THE EARTH AS A GARDEN OF EDEN, as in:

> (18) NEW - The evidence is now so thuddingly inescapable that even George W. Bush - a man who, when pricked, bleeds oil - has acknowledged "the serious challenge of global climate change" in his State of the Union address. It is only a rhetorical concession, another excuse to fiddle as the West Antarctic ice-sheet melts - but it is also a crux moment in the history of global warming denial. Today, the small, lingering band of global warming "sceptics" are beached on the farthest shores of the wrong side of history. They are alone, abandoned even by Global Warming Bush and the oil industry. (…) I know it's painful to give up on something you have passionately believed. So let's - for one last time - go through your arguments. (…) Denier's Myth Number Five: **Global warming is a religion**. People have always had an innate psychological need to believe in **a looming apocalypse** - this is just the latest version. Precisely the opposite is the truth. Global warming is based on very close empirical observation of the real world, and deductions based on reason. *The Independent* January 25, 2007 Thursday The last gasp of the global warming deniers BYLINE: JOHANN HARI

In (18), the journalist imagines deniers' arguments. The stance of the article is not sceptical. Instead, the focus is on the former US President's claim about climate change. The journalist's surprise about the acknowledgement of the environmental issue by a Republican President leads him to describe deniers' stance in order to contradict them.

According to deniers, climate change is a RELIGION. The RELIGION narrative emphasises the fear of the uncertain evolution of climate change which may lead to the APOCALYPSE. This APOCALYPSE is attributed more modern characteristics that correspond to modern life. This adaptation of the concept of APOCALYPSE to different periods is used as a justification for questioning climate change, according to the journalist's stance on deniers' beliefs. This metaphorical use produces a vague identification of the concept of APOCALYPSE and adapts it to social trends rather than linking it to a well-established fear of a unique disaster.

The scenario, attributed to deniers, is opposed to the journalist's stance in the end of the extract: he uses the CLIMATE CHANGE AS A RELIGION narrative to contradict the deniers' arguments. He describes the studies on climate change to emphasise that environmental concerns are based on "empirical observation" and "reason".

4.6. Summary

In this chapter, we have discussed how the idea of England as a "green and pleasant land" provides a picturesque image of the environment in the absence of climate change. We have also seen how this image can be debated through various metaphorical occurrences whose meanings have been adapted to fit different stances. The idea of GREENNESS used by William Blake to depict a pleasant nature unaltered by industries can fulfil argumentative functions in our corpus when metaphor users focus on the protection of the environment, leading to the identification of THE UNAFFECTED ENVIRONMENT AS GREEN scenario. These positive characteristics can also be questioned and criticised depending on the authorial stance.

The eulogy of nature can rely on the picture of the Earth as a SHARED HOME. This scenario highlights a distinction between the concepts of HOUSE and HOME (see

Chapter 6), as discussed by Charteris Black (2004: 99). The latter concept is therefore suitable for the use of the scenario as part of the eulogy. Even in cases where the HOME concept is specified as a TENANCY, the DUTY OF REPAIRING and CLEANING THE HOME does not involve any OWNER and is rather presented as a MORAL DUTY for FUTURE INHABITANTS' well-being. They are positively perceived because they are part of the HUMAN FAMILY.

The HUMANITY/NATURE AS A FAMILY scenario is relevant in climate change discourse. It helps the metaphor users to depict humanity as part of a FAMILY and environmental resources as forming another FAMILY. Nature's and humanity's fates are intertwined. A particular hierarchy can be established to identify nature as a MOTHER on whom humanity depends. This interpretation is linked to the mythological origins of the phrase *Mother Earth/Nature*. The characterisation of the MOTHER can convey positive appreciations (e.g., "beautiful" *mother*) which fits Lakoff's description of the NURTURING PARENT (2004). However, his related description of the STRICT FATHER has been adjusted in the narrative identified in our corpus: the damage of pollution can be perceived as triggering the MOTHER'S ANGER, framing the picture of a STRICT MOTHER whose PUNISHMENT has to be feared and prevented. This conceptualisation produces a major adjustment to the identity of the STRICT PARENT.

We can possibly relate this adjustment to the mythological background involved in the identification of Earth/Nature as a MOTHER. This background takes into account mother goddesses of the Earth who can either be NURTURING or STRICT. The reliance on myths promotes the identification of CLIMATE CHANGE AS A RELIGION narrative. It can refer to unpolluted environment as the GARDEN OF EDEN, a place with divine origins. The religious conceptualisation helps metaphor users to highlight the uncertainty regarding the validity of environmental beliefs. Therefore, our findings correspond to Atanasova and Koteyko's interpretation (2017a): RELIGION narrative in climate change discourse can mock people's over-reliance on science, transforming their belief into a form of BIGOTRY. Occasionally, this conceptualisation can sarcastically refer to humans' over-reliance on industries. Nerlich's (2010) findings are also significant because the SACRIFICE scenario can depict undocumented decisions taken by BELIEVERS (i.e., scepticism as a safe option; 2010: 8-13).

Overall, the narratives that are part of the eulogy of nature provide a concrete picture of the benefits comprised within an unaffected environment and the necessity to preserve natural resources. They also favour climate actions through the occurrences of particular scenarios which establish the possibility of returning to this pleasant environment and to take advantage of its resources. However, this eulogistic view can be debated through sarcastic use of related scenarios.

In the following chapter, we discuss the narratives which provide a metaphorical picture of the deterioration of nature with a focus on the necessity to control and prevent climatic deterioration.

Chapter 5: Perspective of the deterioration of nature

5.1. Introduction

The environmental damages attributed to climate change can be perceived as a deterioration of nature. While the scenarios in Chapter 4 distinguish a previous idealised quality of nature from its present/future affected quality, the perspective of deterioration accentuates the progressive loss of essential resources which has detrimental impacts on human life. The arguments promoted by this perspective are conferred on the visualisation of the effect of climate change. The call for actions is derived by highlighting the necessity to limit this deterioration (i.e., preventing humanity from losing more resources).

The description of climate change as a deterioration of nature can rely on the NATURE AS A DAMAGED BODY narrative. This narrative attributes different ORGANS to the planet which are DAMAGED because of climate change or environmental decisions. Metaphor recipients can relate the damages done to the Earth as BODY DAMAGES, which is a way for metaphor users to shape the misunderstood and, occasionally, invisible effects of climate change according to a familiar experiential basis of physical suffering. The evolution of climatic impacts can be perceived as a BODY suffering from different ILLNESSES, with different degrees of urgency (i.e., an ILLNESS from which the BODY can RECOVER or an ILLNESS that is FATAL to the BODY).

The ATMOSPHERIC DAMAGE AS A HOLE scenario (e.g., *ozone hole*; Väliverronen & Hellsten 2002: 229; 235) in climate change discourse can be included within this narrative. In such cases, the metaphor users focus on the role of pollution and depict it as an AGGRESSOR who ATTACKS the BODY from which a WOUND results that is either SPREADING or HEALING. Therefore, the NATURE AS A DAMAGED

BODY narrative includes a scenario of AGGRESSION, which differs from BODY ILLNESSES.

A competing narrative emerges from the ATMOSPHERIC DAMAGE AS A HOLE scenario picturing the deterioration of nature as a CONTAINER that is DAMAGED by pollution and cannot fulfil its protective functions. The arguments involve the DANGEROUS LOSS of resources that were previously CONTAINED. The metaphor recipients can conceive the deterioration of nature as an expropriation of environmental resources. The metaphor users emphasise the detrimental outcome of this LOSS by highlighting the threatening characteristics of the LOST CONTENT. The personification characterises this CONTENT through human traits pertaining to offensive and dangerous human-like behaviours. This conceptualisation aims at instigating decisions about the necessity to CAPTURE this offensive CONTENT to prevent it from causing damages.

In this chapter, we discuss the role played by scenarios and narratives to provide a concrete image of the deterioration of nature.

5.2. The NATURE AS A DAMAGED BODY narrative

5.2.1. The BLOOD scenario

The NATURE AS A DAMAGED BODY narrative pictures the target domain as a single organism. This conceptualisation recalls the NATURE AS A MOTHER scenario discussed in Chapter 4. The description of the planet as an organism involves an attenuation of nature's individual features (i.e., particular natural elements) to highlight the role of each element within the same organism. Consequently, the deterioration of one element leads to the deterioration of others, eventually damaging the whole entity. The related scenarios describe the transformation of resources as the transformation occurring within the VITAL ORGANS/COMPONENTS of the BODY, as in:

> (1) NEW - **A rise in atmospheric CO2 means that plants need less by way of water for their growth**; Caldera's (atmospheric scientist) study demonstrated that doubling the amount of carbon dioxide, while holding steady all other inputs, such as water and nutrients, yielded a 70 per cent increase in plant growth. This would not come remotely as a surprise to people of my generation, who were taught at school that **carbon dioxide was the lifeblood of plants**, but will perhaps be a shock to the present generation of schoolchildren who are being lectured that **man-made CO2 is tantamount to poison**. Myhrvold (Chief Technology Officer at Microsoft) goes on to tell the **freakonomists** that while the IPCC is fretting fearfully about the CO2 in the atmosphere increasing from about 280 parts per million to 380, our mammalian ancestors successfully evolved at a time when the atmospheric concentration of CO2 was over 1,000 parts per million. *The Independent* October 13, 2009 Tuesday Here's another phoney war: the one on climate change BYLINE: Dominic Lawson (my addition in parenthesis)

The BLOOD scenario refers to an exemplary BODY component that is necessary for the BODY to live. In (1), the journalist emphasises this aspect through the specification LIFE-BLOOD reinforcing the idea of PLANTS AS A LIVING BODY. The BLOOD scenario refers to a BODY COMPONENT which plays a role in the functioning of every part of the BODY. Its absence or alteration leads to the alteration and defectiveness of every ORGAN.

Extract (1) focuses on this VITAL aspect to ironically describe recent beliefs about carbon. The VITAL aspect of carbon is compared with modern accounts presenting carbon as POISON.

The journalist contrasts the concepts of BLOOD and POISON. The two source domains are mapped with a similar target domain, CARBON. The journalist distinguishes past lessons taught to children about the effect of CO2 on plants from current lessons taught to children about the characteristics of CO2. Dominic Lawson uses the source domain LIFEBLOOD as the antipode of POISON. He presents a contrastive view on the role of carbon which enables plants to LIVE while present-days teachers characterise it as a POISON. The mapping between CARBON and LIFEBLOOD conveys particular characteristics to the gas related to its role in the evolution of plants which is compared to the role of BLOOD within the human body.

Hence, the description of carbon as POISON appears unrealistic. The journalist refers to previous scientific findings (“Caldera’s study”) and lessons learnt by children in the past to argue against the identification of carbon as a POISON which, according to

this sceptical opinion, is based on the claims of "freakonomists" and teachers' interpretations.

In this extract, the journalist endorses the BLOOD scenario highlighting the VITAL role of carbon in the evolution of plants. Such an endorsement aims at contradicting present descriptions of the damaging characteristics of carbon whose amount is expected to be reduced because of climate change.

5.2.2. The LUNGS scenario

The metaphor users can focus on carbon dioxide as a particular gas whose distinctive features make it dangerous for the BODY. The NATURE AS A DAMAGED BODY narrative introduces the function of a different ORGAN which is cited as an exemplary VITAL BODY COMPONENT that can be damaged by such gases. The LUNGS scenario is effective in picturing the process by which pollution can DAMAGE nature, depicted as a BODY, as in:

> (2) NEW - Apart from the increased amounts of methane and carbon dioxide that are produced by this type of farming, the world loses out through loss of wildlife - 90 percent of all species on Earth live in rainforests - as well as through the destruction of trees which filter our air, **emit oxygen and absorb carbon dioxide**. Rainforests are the **lungs of the Earth but we are choking them** through our appetite for meat, say environmentalists. (…) The issue of meat-eating and global warming is far from clear cut, in other words. Turning to a vegetarian diet to save the planet might produce significant cuts in carbon production in many parts of the world but it could also have damaging consequences for others, including Britain. **The UK has a long, established tradition in lifestock production and its agriculture is geared to those ends.** So yes, cut back on your week's intake of ham and chicken as Pachauri suggests but individuals should not feel pressured into adopting a lifestyle that is completely vegetarian in order to help to halt global warming. *The Observer* September 7, 2008 News: Special report: Is our taste for Sunday roast killing the planet? BYLINE: Robin McKie and Caroline Davies

> (3) NEW - We're told, endlessly, that climate change will mean the end of the Amazon, of the tropical forests, and the Earth will **lose its lungs**. It appears that this is **not wholly and completely true**. Actually, an increase in CO2 in the atmosphere is likely to **lead to the growth** of huge, new, tropical forests. *telegraph.co.uk* July 9, 2012 Monday Climate change will mean new and larger tropical forests BYLINE: Tim Worstall

> (4) ENV – (…) Threats from mining companies to take Indonesia to an international arbitration court over curtailing existing mining leases is no source for concern, because the government has the ultimate right to act in accordance with the public interest. Moreover, the international community has an obligation to protect Indonesian forests, described as **"lungs of the world"**. *Friends of the Earth*. Protests against mining giants and Indonesian government 03 July 2003

The NATURAL RESOURCES AS LUNGS scenario emphasises the necessary role of this ORGAN in the WELFARE of the BODY. The metaphor users describe the LUNGS as an ORGAN enabling nature to BREATHE. They depict the actions of gases in the evolution of climate change through specific features of the source domain. The LUNGS are used as an exemplary ORGAN affected by harmful gases. Metaphor users rely on this scenario to emphasise the need for protection and to exploit its related features to highlight NATURE'S RESPIRATORY issues. The management of gas ABSORPTION by forests is compared to the ABSORPTION OF GAS BY HUMAN LUNGS. The scenario describes the role of forests which can absorb the gas or emit it when the trees are chopped. This process favours the description of LUNGS as a specific component of the BODY.

In (2), the journalists refer to environmentalists' stance on the effect of people's food consumption on forests. The RESPIRATORY CONDITIONS of the Earth are described as being ruled by humans who CHOKE THE LUNGS (i.e., deterioration of rainforests). The ABSORPTION of dangerous gases is pictured as an ATTACK which directly occurs on the ORGAN (i.e., rainforests) rather than on the BODY (i.e., the Earth). This precision is significant to identify the argumentative purpose of the scenario because it describes how human activities can affect the environment ("Turning to a vegetarian diet to save the planet might produce significant cuts in carbon production"). The action of CHOKING THE LUNGS does not only involve RESPIRATORY issues related to the gases but also a progressive deterioration of the RESPIRATORY capacities (use of the present participle, "are choking"). Hence, this ATTACK can be stopped before the BODY loses this capacity: the environmentalists' focus is not only on deforestation ("destruction of trees"), it is also on the role of rainforests in the absorption of carbon.

According to environmentalists the ATTACK can be stopped by adopting a vegetarian diet. The journalists question this claim in the remainder of the article: they

refer to the economic value of the meat industry in the UK. However, they do not criticise the environmentalists' stance. Instead, they contest the dramatic images attributed by environmentalist to food consumption and they adopt a more dispassionate view: “So yes, cut back on your week's intake of ham and chicken”.

In different versions of the scenario, the BODY can LOSE ITS LUNGS, i.e. the Earth can “lose” tropical forests. The LOSS OF LUNGS in (3) does not explicitly lead to the DEATH OF THE BODY. The journalist denies the possibility of any catastrophic outcome (“We’re told”; “not completely true”), such as THE LOSS OF THE LUNGS. He attributes this dramatic image to different (unnamed) discourse producers. The journalist’s stance disputes the image of LOST LUNGS through an indirect depiction of GROWING LUNGS. He suggests that the ABSORPTION of gases by the BODY (i.e., the Earth) results in the growth of NEW LUNGS or in the EXPANSION OF THE LUNGS: the forests are first identified as the LUNGS of the Earth, therefore the growth of the forests described in the last sentence of the extract can be understood as the GROWTH OF THE LUNGS, “lead to the growth of huge, new, tropical forests”. The belief that the gas DAMAGES THE LUNGS is contradicted by the image of growing forests resulting from the ABSORPTION. The journalist contests equivocal discourses about damaged tropical forests with opposite, and almost eulogistic (“huge, new”), images of the evolution of tropical forests. He does not only deny the identification of FORESTS AS LUNGS, he also denies the identification of carbon as a damaging gas for the FORESTS-LUNGS concept.

In (4), *Friends of the Earth* rely on the NATURAL RESOURCES AS LUNGS scenario to highlight the VITAL function of forests and to support their protection. We can interpret the phrase “*lungs* of the world” in quotation marks in different ways (no explicit mention is made of the source of the quotation): it may refer to a possible Indonesian idiom because the article focuses on the effect of pollution in this country or the quotation may refer to a conventional metaphorical characterisation (this scenario frequently characterises the role of forests, see Appendix 2 pp. 46-52; 433) to describe the function of forests as natural resources. The environmentalists endorse this characterisation to express their support for the protection of forests.

In extracts (2) to (4), the NATURAL RESOURCES AS LUNGS scenario either helps the metaphor users to picture the BREATHING function of natural elements, or to depict the human influence on nature as an ATTACK ON THE LUNGS, or to deny climatic damage through descriptions of NEW LUNGS.

5.2.3. The MEDICAL SUPPORT scenario

The MEDICAL SUPPORT scenario pictures NATURE AS A DAMAGED BODY which SUFFERS from a variety of HEALTH ISSUES. This scenario helps the metaphor users argue for initiatives to support the environment by presenting the actions to STOP THE PAIN: they rely on the metaphor recipients' experience of health issues and suffering. The addition or improvement in MEDICAL EQUIPMENTS is perceived as a solution. The outcome is either optimistic or pessimistic regarding the possibility of CURING particular ILLNESSES. The MEDICINE-related scenario helps metaphor recipients to identify the REMEDY. In some cases, the scenario involves MEDICAL EQUIPMENTS which are acknowledged to be required for SERIOUS DISEASES, as in:

> (5) NEW - So when sceptics tell me not to worry about climate change, I don't buy it. We are interfering with major geological forces. Carbon dioxide is the planet's **thermostat**. Nature has **flicked the carbon switch** before. Now we are **flicking the switch** again. **We are interfering with the planet's life support systems**. *The Guardian* November 30, 2009 Monday Copenhagen 2009: Why Copenhagen matters BYLINE: Fred Pearce

> (6) SCI - Astronomical or Milankovitch **forcing** has become established as the primary **'pacemaker'** of the ice ages, accounting for much of the total observed climatic variance of the late Quaternary. Most climatic variances at frequencies lower than 1 cycle per 19,000 years is related to astronomical **forcing**, and even abrupt glacial terminations can be attributed to such **forcing**. *Nature* volume338, pages553–557 (13 April 1989)Climate change in the circum-North Atlantic region during the last deglaciation Jonathan T. Overpeck, Larry C. Peterson, Nilva Kipp, John Imbrie & David Rind

> (7) ENV - Nnimmo Bassey (Chair of Friends of the Earth International) said: "(…) Rich countries tried to **assassinate** the Kyoto Protocol and it is now on **life support**, we have to redouble our efforts in the coming year to **revive** it." *Friends of the Earth*. Cancun package merely prevents collapse and leaves Kyoto protocol on life support 11 December, 2010

The LIFE SUPPORT and PACEMAKER scenario-versions describe processes which enable the planet to SURVIVE. The related DISEASES - although not mentioned in most of the extracts (except in 7 which depicts a MURDER) - are characterised by their impact on particular ORGANS which have ceased to function effectively and require MEDICAL EQUIPMENTS to keep them active.

In (5), the journalist depicts NATURAL PROCESSES AS LIFE SUPPORT SYSTEMS to contradict sceptical claims ("I don't buy it"). He pictures the effect of carbon emissions as "flicking the switch" of the "planet's thermostat". He distinguishes the previous increase of temperatures ("Nature has flicked the carbon switch before") from humans' future increase of temperatures ("Now we are flicking the switch again"). This distinction aims at explaining the relevance of the Copenhagen meeting which involves agreements on emission reduction. This conceptualisation links climatic evolution to humans' decision to alter the "thermostat". In the end of the extract, this decision is perceived from a more dramatic viewpoint. The journalist describes the alteration of the Earth's LIFE SUPPORT SYSTEMS. Pollution is identified as DAMAGE TO THE BODY (i.e., the Earth) while natural processes, identified as the Earth's LIFE SUPPORT SYSTEMS, enable THE BODY to LIVE. The journalist focuses on human decisions which threaten the functioning of such EQUIPMENTS. This depiction highlights the significance of the meeting and the journalist's expectations about agreements.

In (6), the scientists refer to a past period ("ice ages"; "19,000 years") which is not associated with climate change (at least not as it is currently defined) but the presence of a PACEMAKER (i.e., atmospheric *forcing*) suggests that the ice ages were already SUFFERING FROM A DANGEROUS DISEASE because their HEART could not function without such a piece of EQUIPMENT. The FORCING scenario (discussed in Chapter 7) relies on the image of an INTERACTION involving atmospheric elements which FORCE climate to evolve in particular ways. This influence on climatic evolution justifies the role of the PACEMAKER as it determines the way the HEART functions within the BODY. Hence, this scenario can be used to explain the present climatic events ("most climatic variances").

In (7), *Friends of the Earth* identify the MEDICAL CONDITION suffered by the Kyoto Protocol resulting from climate decisions taken by rich countries. These countries are blamed for their decisions characterised as CRIMINAL by environmentalists (see Chapter 7). The environmentalists describe themselves as the SAVIOURS of the Kyoto Protocol ("we have to redouble our efforts"): they claim that CRIMINAL decisions have DAMAGED the Protocol as a BODY which is consequently on LIFE SUPPORT. This MEDICAL CONDITION is described as a threat to the HEALTH OF THE BODY ("to *revive* it"). However, *Friends of the Earth* expect this condition to be temporary which is the reason why they try to REVIVE the Protocol. This extract strongly criticises the decisions of rich countries and justifies the environmentalists' actions. They use the scenario to instigate hope and to highlight the significance of the agreement.

The MEDICINE-related scenario can lead to different resolutions: the metaphor users can either be pessimistic through descriptions of the Earth's TERMINAL CONDITION or optimistic with a focus on possible RECOVERY. This is demonstrated in the following examples:

> (8) NEW - The whole planet is about to **fry** because of global warming caused by manmade carbon dioxide emissions, one of the **antidotes** to which is the beneficent oxygenation of the Earth by the tree world which soaks up carbon dioxide. The driving message of the eco-doomsters has been 'green plants good, man bad'. This has become a received wisdom that simply cannot be questioned. (…) Anyone foolhardy enough to challenge this orthodoxy is mercilessly mocked or vilified as stupid, insane or in the pay of the evil oil lobby. Yet lo and behold, what do we now read? That the forests are actually partly responsible for global warming. Rather than 'save the trees', it seems, it's 'blame the trees'! *Daily Mail* January 13, 2006 Friday Does this prove that global warming's all hot air? BYLINE: MELANIE PHILLIPS

> (9) SCI - A **last-ditch remedy for an ailing planet**, or a reckless scheme that could be a greater threat to life on Earth than the problem it aims to solve? Opinions are sharply divided on geoengineering — potential massive interventions in the global climate system, intended to forestall the worst effects of climate change. *Nature* 468, 13-14 2 November 2010 Geoengineering faces ban, Jeff Tollefson

In (8), the conceptualisation of TREES AS AN ANTIDOTE implicitly identifies gases as POISON or VIRUS, relying on the NATURE AS A DAMAGED BODY narrative. Even though the focus of the extract is not on the SUFFERING of the planet, its damage is still

described in terms of FRYING. FRYING pertains to a process that demands a very high degree of heat to be achieved. Such a level of heat cannot be related to BODY WARMTH. This FRYING heat can be contrasted with the increase of heat experienced on the planet. Since climate change is a progressive phenomenon, the description of this high degree of heat produces a hyperbole which focuses on the irreversible and lethal aspect of such temperatures.

The use of the source domain FRY fulfils sceptical arguments. The conceptualisation of a high degree of heat as FRYING to discuss global warming represents an exaggeration of the phenomenon. The journalist's sceptical stance appears within the reference to other findings attributing responsibility to the trees and, therefore, picturing the phenomenon as a natural process caused by the absorbing ability of the trees. These findings promote a sceptical stance and criticism towards "eco-doomsters". The description, attributed to environmentalists, of the absorbing ability of the trees as an ANTIDOTE is contradicted by the journalist who describes it as the cause of climate change.

This sceptical argumentation regarding the human origin of climate change is even more explicit in the title of the article which discusses the conceptualisation of global warming as FRYING heat to define it as simply being "hot air". In this title, the journalist jokingly relies on the common ground existing between the idiomatic expression "hot air" and the topic of climate change, whose reality is questioned in the remainder of the article.

In (9), the scientist discusses the possibility of a REMEDY (i.e., geoengineering) but its positive features are questioned through the characterisation *last-ditch* (and through additional characterisation such as "a greater threat to life on Earth"). The extract promotes the existence of this REMEDY, but its effect can either STOP THE PAIN ("*ailing* planet") or AGGRAVATE THE HEALTH CONDITIONS ("*last-ditch*"). This distinction is related to the arguments questioned in the scientist's statement which discusses the general and disputed reputation of the process of geoengineering ("Opinions are sharply divided"). He refers to these varying opinions about geoengineering through the NATURE AS A DAMAGED BODY narrative which emphasises the HEALING and the DANGEROUS characteristics of this possible solution. The scientist uses the MEDICINE-related scenario to emphasise the risks involved in the application of this solution.

The description in (8) suggests that the natural resources perceived as the ANTIDOTE are in fact the cause of the DISEASE while the scientist in (9) perceives geoengineering as a potential, yet controversial REMEDY.

5.2.4. The HOLE/ SKIN scenario

The descriptions of BODY DAMAGE sometimes involve a voluntary action. These descriptions characterise the effects of pollution as a WOUND. This interpretation is retrieved from the occurrences of the *ozone hole* metaphor which can define a PHYSICAL DEFECT left after an AGGRESSION. This can be seen in the following examples:

> (10) POL - We will join with others to seek further protection of the ozone layer - that **global skin** which protects life itself from ultraviolet radiation. 14/10/1988 Leader's speech, Brighton, Margaret Thatcher (Conservative)
>
> (11) NEW - The Earth's **protective ozone layer** is slowly **recovering**, United Nations scientists report, but the unintended knock-on effect is increasing climate change. Successful implementation of the 1987 Montreal Protocol, aimed at reducing Ozone Depleting Substances (ODSs) including many chemicals used in aerosol cans and refrigerators, mean the ozone layer is expected to **recover** to 1980 levels by the middle of this century. (…) But the ozone layer is still far from **healed**. The long-lasting chemicals still lingering in the atmosphere create an annual autumnal ozone **hole** above the extreme Southern Hemisphere and the **hole** hasn't closed up. *Independent.co.uk* September 11, 2014 Thursday Ozone layer is **healing** - but we are now contributing to climate change more than ever; Montreal Protocol saw decrease in use of ozone-**harmful** chemicals but substitutes are thought to considerably increase climate change emissions BYLINE: Rose Troup Buchanan

The *ozone hole* metaphor can be interpreted as part of the NATURE AS A DAMAGED BODY narrative. The fragile and protective features of the ozone layer are comparable to the features of the SKIN covering the BODY (in 10). Consequently, the OZONE HOLE can be interpreted as a WOUND DAMAGING THE SKIN. This interpretation highlights the acknowledgement that the *ozone hole* is perceived as a solved issue ("slowly *recovering*"; in 11), which can justify the use of a source domain whose referent does not undergo dramatic DAMAGE (e.g., climate change or pollution as a DANGEROUS ILLNESS).

In (11), the picture of the OZONE LAYER AS THE SKIN is first characterised by its HEALING CONDITION. This characterisation emerges from scientists' statements. This HEALING CONDITION results from the enactment of particular decisions taken as a result of the Montreal Protocol. However, the journalist denies the reality of this HEALING CONDITION. She refers to the Protocol as an agreement on the CURE while emissions of chemicals have not stopped, preventing the HOLE from HEALING. The journalist highlights the contradiction between the beliefs about *the ozone hole* as it is qualified by the Protocol and the continuous emissions which disprove the beneficial effect of the political agreement.

The OZONE HOLE AS A WOUND scenario, related to the NATURE AS A DAMAGED BODY narrative, does not involve any VITAL ORGAN or MEDICAL EQUIPMENT. Its use in our corpus highlights the HEALING capacity of particular components of the BODY, such as the SKIN. It is attached to an optimistic view of the results of human actions, which can be disputed depending on the authorial stance.

5.3. The NATURE AS A DAMAGED CONTAINER narrative

While the scenarios discussed in the preceding sub-chapter depict the deterioration of nature as an ILLNESS progressively DAMAGING the BODY, the following scenarios similarly picture the deterioration of nature as DAMAGE which is here applied to a CONTAINER. Unaffected nature is perceived as a CONTAINER that is fitted for human life, while climate change alters the CONTAINER by producing a HOLE. The consequences either involve the LOSS of the elements previously CONTAINED or the ACCESS of external elements identified as INTRUDERS. This interpretation relies on the picture of the Earth as a HOME discussed in Chapter 4 with a focus on climate change as a defect of the HOME.

The link between HOLE AS A BODY WOUND and HOLE AS A DAMAGED ZONE OF THE CONTAINER resonates with Semino's findings (2011) on metaphors of pain. She highlights the common features shared by the target domain PAIN MECHANISMS and the source domain GATE. She starts her analysis by referring to the scientific theory produced by Melzack and Wall in 1965, which uses the metaphor to

illustrate the conditions in which pain is experienced or not experienced (2011: 135-6). It results in the "Gate Control Theory of Pain" according to which pain is experienced when the GATE IS OPENED (i.e., the transmission cells successfully transfer "pain" messages to the brain) and pain is not experienced when the GATE IS CLOSED (i.e., the transmission cells cannot transfer messages; 2011: 136-7). Semino investigates this metaphor by comparing literary genres. In the remainder of her study, she focuses on the use of the metaphor in three educational texts (i.e., a website aimed at children, a self-help guide for chronic pain sufferers, and a book aimed at medical professionals; 2011:140). She observes different metaphorical uses such as the PARTIAL (in the scientific theory) and the COMPLETE OPENING/CLOSING OF THE GATE (in the three educational texts; 2011: 143; 146; 149), and the different agents responsible for the OPENING/CLOSING OF THE GATE, i.e. the GATE is OPENING/CLOSING ITSELF in the scientific theory while in the self-help guide and in the book aimed at medical professionals, the sufferer can also be responsible for its OPENING/CLOSING (2011: 144-5;149).

Our analysis does not aim at establishing such a link between the DAMAGED BODY and the DAMAGED CONTAINER narratives but the various uses of the *ozone hole* metaphor in our corpus seem interrelated, thereby echoing Semino's findings (2011). We can apply Semino's results to climate change discourse because the HOLE exemplifies a deterioration of nature (i.e., the OPENING OF THE GATES related to PAIN) and its CLOSING is understood as a resolution (i.e., CLOSING OF THE GATES related to ABSENCE OF PAIN; Semino 2011).

The DAMAGED CONTAINER narrative conveys dramatic images involving the CONTENT of the CONTAINER. The dramatic content of these images may be emphasised through the use of metaphorical verbs describing the MOVEMENT of the elements (previously CONTAINED) out of the CONTAINER.

5.3.1. The LOSS OF CONTENT scenario

The LOSS OF CONTENT scenario is related to the DAMAGE OF THE CONTAINER consequently liberating the CONTENT. The description of this process involves the

personification of the CONTENT whose ESCAPE or RELEASE from the CONTAINER is characterised as a human-like movement.

The results from the BNC analysis (from *SketchEngine*, Kilgarriff 2003) for the search term "escape" show that the verb frequently collocates with negatively oriented words such as "prisoner", "death", "punishment", "destruction", and "violence". These collocations include "escape" within descriptions of dangerous situations. These situations, in the contexts available in the BNC, involve participants who are either dangerous or in danger: for example, the escapee can be characterised by his/her need to be "contained" because he/she is dangerous for other humans (e.g., "the gunmen *escaped* arrest" token number: A77-40424318) or by his/her position within a "container" that endangered his/her well-being (e.g., "he left to *escape* the bloody violence in Ulster" token number: CH6-85119087). In both cases, the related "containers" are defined as undesirable for the escapee, but they can be desirable for other humans because the escapee is perceived through his/her detrimental qualities. Hence, the meaning of "escape" is related to dangerous situations, but the action can be perceived positively or negatively depending on the characteristics of the "container" and of the escapee.

The BNC results for the search term "release" are more positively oriented with collocations depicting a deliberate action. The separation of the "content" from the "container" is presented through its beneficial effects, with words such as "album", "tension", "hostage", "breath" and "pardon".

Both search terms ("escape" and "release") frequently collocate with the noun "prisoner". With "escape", the movement outside the "container" is related to other participants' lack of attention. The escapee (or prisoner) is expected to be "contained" and his presence outside the "container" is interpreted as leading to dangerous situations (e.g., "Suddenly an evil face, more like an animal than a man, looked at us from behind the rock. The *escaped* prisoner saw us and screamed as he turned to run." token number: H7V-17977598). With "release", the movement outside the "container" is managed by other humans, following considerations that the "release" of the "contained" participants leads to favourable situations (e.g., "Under the terms of the Record of Understanding, the government having already *released* some 150 prisoners late on Sept. 25 as a gesture of good faith, undertook to complete the phased *release* of all political prisoners by Nov. 15." token number: HLP-12951169). Hence, the meaning of "release" is linked to

dangerous situations (like the meaning of "escape") but it focuses on a positive situation resulting from it.

This comparison between the two verbs can also be established in our corpus, as demonstrated in the examples below:

> (12) NEW - The complex atmospheric changes which cause the hole in the ozone layer also allow heat to **escape** from the Earth. If **the ozone hole is mended**, as scientists predict it will be, then the Earth will heat up faster than it otherwise would. *The Guardian* January 23, 2001 Global warming: A world of extremes as the planet hots up BYLINE: Paul Brown

> (13) NEW - In 2007, a new record was set for the minimum summer **sea ice cover in the Arctic**. This **furious flag waving** attracted the attention of the world. (…) **Removing the lid** from the pole will **release** heat equivalent to fast-forwarding human-caused climate change by two decades, say scientists. Will this be the first great tipping point to tumble the world into a new and hostile climate regime, as the cooling, reflective ice vanishes? Will the new, warm Arctic radically alter the temperate weather enjoyed by Europeans, for whom global warming has seemed a distant concern? We seem to be prepared to take that chance. The shrinking ice has not opened new leads for decisive global action to tackle climate change. *The Guardian* September 15, 2012 Saturday National: Climate change BYLINE: Damian Carrington

> (14) SCI - The dual discoveries of the apparent existence of warm, deep waters at the IETM, and vast amounts of methane-containing gas hydrates — ice-like crystals of gas and water — along continental slopes, thus led to the following proposal: like those of today, gas hydrates in marine sediments included large amounts of ^{13}C-depleted biogenic methane; some change in conditions at the start of the IETM caused relatively warm water to sink in the oceans, and that warming resulted in the dissociation of the gas hydrate; The **free** methane thus **released escaped** from the sea floor, and was then oxidized to CO_2 in the ocean or atmosphere. *Nature* volume429, pages513–515 (03 June 2004) Global change: Hydrocarbon-driven warming, Gerald R. Dickens

In (12), the ATMOSPHERIC DAMAGE AS A HOLE scenario establishes the cause of the ESCAPE of heat. The amount of heat on Earth is described as tolerable because of the HOLE IN THE CONTAINER (i.e., the atmosphere) but the MENDING OF ITS DAMAGED ZONE could increase this amount ("the Earth will heat up faster"), which is negatively perceived in the context of climate change. Here, the journalist describes the HOLE as a DAMAGE that has positive consequences (i.e., ESCAPE of dangerous heat). These consequences raise questions about the necessity to MEND THE HOLE, as scientists suggested. The metaphorical ESCAPE focuses on humans' passive role: according to the journalist, the unintentional consequences of pollution producing

the HOLE have decreased temperatures on Earth and the MENDING, which is not produced by specific agents in the text (i.e., use of the passive form "is mended"), can increase the temperatures. This conceptualisation highlights humans' lack of control on temperatures even though the DAMAGE they have caused has beneficial consequences.

In (13), the journalist uses the CLIMATIC DAMAGE AS A LOSS scenario to discuss scientific findings. Through the use of indirect speech and general reference to "scientists", no identification of a specific group or finding is made in the remainder of the article. He pictures the CONTAINER according to its protective functions. The CONTENT is presented in relation to its interdependence with the CONTAINER itself: the sea ice cover, i.e. the COVER OF THE CONTAINER, prevails because heat is not part of its CONTENT, but the inclusion of heat within the CONTAINER would make the COVER disappear (i.e., melting). The alteration of the CONTENT would endanger the CONTAINER but also the Earth (i.e., sea level rise and warming). The journalist describes this danger as a "furious flag waving" taking into account humans' lack of attention which promoted the WAVING as a consequence of increasing danger. The scenario is associated with a LID (i.e., the "sea ice cover") as a metaphorical representation of the COVER OF THE CONTAINER: this representation emphasises human responsibility for the alteration of the CONTAINER because the source domain LID comprises images of SMALL CONTAINERS specifically used by humans. The re-scaling of the process through the LID scenario-version emphasises the human cause of the RELEASE. The danger of the RELEASE is stressed with reference to scientific findings which compare this RELEASE to the RELEASE of heat occurring within two decades.

The journalist contrasts the scientific findings with the lack of attention from Europeans ("distant concern"; "The shrinking ice has not opened new leads for decisive global action to tackle climate change"). He does not endorse the scientific view as demonstrated by the fact that the scenario is followed by several direct questions regarding these findings. Instead, he focuses on the potential risk of this RELEASE which is not noticed by the population.

In (14), the scientist depicts the EXIT from the CONTAINER by using the CLIMATIC DAMAGE AS A LOSS OF CONTENT scenario. He associates the CONTAINMENT of methane with the absence of warm water (before "some change in

[oceanographic] conditions" occurred). The change of conditions has added warm waters to the CONTENT of the oceans. This addition has altered the existing CONTENT, i.e. "methane-containing gas hydrates", and has caused the RELEASE of methane. This causal relation between warm water and methane justifies the use of the source domain RELEASE. The methane, as part of the former CONTENT, is FREE because it can ESCAPE in the ocean or the atmosphere. Hence, the addition of warm water in the CONTAINER has caused the RELEASE which has FREED the methane which can now ESCAPE to different places. The RELEASE is perceived as the origin of a more general and more dangerous process, the ESCAPE of the FREE CONTENT.

5.3.2. The LOSS OF CONTROL OVER OFFENSIVE CONTENT scenario

Some scenario-versions depict the ESCAPE/RELEASE of the CONTENT through negative characteristics which identify the CONTENT as dangerous for the environment. This dangerous effect can be described through the use of personifications attributing negative human traits to the LOST CONTENT. In different cases, this CONTENT is characterised by particular negative features which help to identify the CONTENT as detrimental for humans or the planet. The former scenario is apparent in the example below:

> (15) ENV - ExxonMobil Chairman Lee Raymond is on record advocating that developing countries should lower environmental standards in order to promote economic growth. A recent report on the Baytown refinery in Houston has revealed **persistent accidental releases and failure to report problems and emissions**. Twelve years after the infamous Exxon Valdez disaster, **contamination continues**. ExxonMobil has been fined millions for **Clean Air Act violations** and the company openly funds anti-environment think tanks. *Friends of the Earth*. Exxonmobil (Esso) international day of action: 11th of July 18 June, 2001

In (15), *Friends of the Earth* use the LOSS OF CONTROL OVER OFFENSIVE CONTENT scenario to criticise Exxon's action. They quote ExxonMobil Chairman who asked developing countries to favour economy over the environment. The environmentalists contrast this claim with the findings of a report on the Baytown refinery which has highlighted a precarious RELEASE of polluting substances by Exxon. *Friends*

of the Earth use this contrast to criticise Exxon's actions and rely on the CONTAMINATION scenario-version to emphasise the danger caused by the company.

By allowing the CONTENT out of the CONTAINER, Exxon has initiated a CONTAMINATION. Even though the RELEASE is not perceived as being intended by Exxon ("accidental"), the movement OUTSIDE THE CONTAINER (i.e., Exxon industries) is described as a voluntary negative action because the RELEASE is "persistent" and has not been reported by Exxon. This information helps environmentalists to characterise this RELEASE as a "violation". *Friends of the Earth* distinguish the metaphorical expression *contamination* from the metaphorical phrase *clean air* (which originates in political communication "Clean Air Act"). This distinction further characterises pollution and emphasises its negative effect by qualifying it as a SPREADING VIRUS ("contamination") as well as DIRT ("clean air"). Consequently, the picture of pollution is highly effective in illustrating its damaging effects.

The alternative characterisation of the LOST CONTENT relies on human features that promote the identification of DANGEROUS ESCAPEES, as in:

> (16) NEW - Global warming can adopt a "**runaway**" character, proceeding with terrifying **speed**: we know from the atmospheric records preserved in ice cores that this has happened in the past. *The Independent* October 12, 2004, Tuesday NOW, MORE THAN EVER, IT IS IMPERATIVE TO CONFRONT AMERICA OVER CLIMATE CHANGE

> (17) SCI - And cost alone is not the best way to choose between options — geoengineering, for example, is expensive in terms of risk but may be necessary if we are faced with **a disaster scenario** such as **runaway** temperatures. It makes more sense to think of the solutions as making up a portfolio of options, including others such as nuclear power, guided by risk analysis. *Nature* volume467, pages784–785 (14 October 2010) Climate change: Insurance for a warming planet, Martin L. Weitzman

> (18) ENV - Friends of the Earth warned that existing emission targets under the treaty are insufficient to avoid **dangerous runaway climate change**, with far deeper cuts required. But despite dramatic scientific warnings and substantial evidence that climate change is happening faster than previously predicted, global emissions are still on the rise. *Friends of the Earth*. Climate change treaty one year old, but emissions still on the rise 15 February 2006

The CLIMATIC DAMAGE AS A RUNAWAY scenario-version relies on a personification which emphasises the difficulty to control the movement and progress of the CONTENT once it is OUTSIDE THE CONTAINER. The results provided by BNC

(from *SketchEngine*, Kilgarriff 2003) for the search term "runaway" either show that the referents can be depicted as avoiding detrimental control for their prosperity (with collocates such as "slave") or dramatic pictures are provided of the impossibility of "catching" the referents and to "contain" them (usually with non-human referents such as "inflation"). This latter interpretation can also emphasise the unexpected positive effect of an action (with positively oriented words such as "success").

In our corpus, the ESCAPED/ RELEASED temperatures, identified as a personified version of warming in 16-18, are attributed negative features. The identification of warming as a RUNAWAY focuses on a lack of human control which can lead to an advanced stage of climate change.

In (16), the scenario is exploited to refer to the SPEED of the ESCAPE which prevents humans from taking more time to organise global actions. The journalist highlights the metaphorical meaning of *runaway* with inverted commas. However, no source is mentioned in the article. The journalist argues in favour of immediate action and indirectly criticises (American) political decisions (in the title) which do not produce effective results: he/she focuses on the contrast between past climate ("this has happened in the past"), current climate, and its potential evolution, RUNAWAY warming. This comparison helps him/her to describe a dangerous climatic evolution in terms of TERRIFYING SPEED: this particular evolution will soon become a reality (i.e., like a dangerous "runaway" coming towards humanity). Hence, the journalist refers to the SPEED OF THE RUNAWAY'S ESCAPE to call for FASTER actions to avoid this dramatic evolution of climate.

The RUNAWAY scenario-version also involves a direct relation between the identification of the ESCAPEE as a RUNAWAY and environmental disasters. In (17) and (18), warming is defined as an element that needs to be CONTAINED to protect humans (e.g., like a prisoner). The personification attributes a malevolent quality to warming: the impossibility for humans of CATCHING THE RUNAWAY leads to further damage caused by the RUNAWAY. This conceptualisation enables the metaphor users to picture PROGRESS IN SPACE AS INCREASING DAMAGE BY WARM TEMPERATURES. The focus is on the need to STOP warming to limit the extent of the damages it can cause. Interestingly, other SCI extracts criticise the characterisation of the Earth's climate as a RUNAWAY (see Chapter 6, extract 17). They attribute the

RUNAWAY quality to the high temperatures of other planets which cannot sustain human life.

In (17), the scientist focuses on the process of geoengineering as a possible solution to climate change. He uses the RUNAWAY scenario-version to identify the characteristic of climate which would be a pre-condition for adopting this measure. This characteristic is compared to the present climate which does not necessitate this process. The scientist adds that the enactment of this measure involves risks because the present climate does not display a RUNAWAY characteristic.

In (18), *Friends of the Earth* endorse the RUNAWAY scenario-version. They refer to scientific findings to establish that this climatic characteristic is very likely to occur. They use the scenario to criticise the emission targets and to convince governments about the necessity to enforce deeper cuts. The RUNAWAY characteristic of climate is here used as a threat regarding the lack of ambitious environmental decisions.

Our corpus shows that scientists can rely on another metaphor to picture the LOST/OFFENSIVE CONTENT, as in the example below:

> (19) SCI - The emissions data from the models were processed through a simple climate model, MAGICC6 (Model for the Assessment of Greenhouse-Gas Induced Climate Change), to assess the combined effects of all greenhouse gases and climate **forcing** agents. The results echoed those that were observed for CO_2 emissions: climate **forcing** and associated temperature change are not discernibly reduced under the Abundant Gas scenario. Four models that endogenously model **fugitive** methane emissions reported increased **climate forcing** with abundant gas. This is largely driven by increased **forcing from fugitive** methane emissions associated with increases in gas consumption. *Nature* volume514, pages482–485 (23 October 2014) Limited impact on decadal-scale climate change from increased use of natural gas, Haewon McJeon, Jae Edmonds, Nico Bauer, Leon Clarke, Brian Fisher, Brian P. Flannery, Jérôme Hilaire, Volker Krey, Giacomo Marangoni, Raymond Mi, Keywan Riahi, Holger Rogner & Massimo Tavoni

In (19), the CLIMATIC DAMAGE AS A FUGITIVE scenario-version highlights the damaging effect of the LOSS OF CONTENT (i.e., methane). The results provided by BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "fugitive" display contextual information related to an "escape" resulting from the characters' inattention. For example, we observe references to the "*Fugitive* Slave Law", as in "the southern racists were very concerned to enforce federal laws in the north that the north didn't like, like *the Fugitive Slave Law*" (token: K78-69699915) or descriptions through nominal

uses of the word such as "One of the most wanted *fugitives* sought by the Italian police, Nunzio Barbar ossa, alleged to be a head of the Neapolitan Camorra, has been arrested" (token: HKU-11028764). These contexts do not determine whether this "escape" is positively or negatively perceived by the discourse producers. The scientific definitions provided by the OED for the adjective "fugitive" establish a more dangerous process: a "fugitive" gas is a gas whose escape leads to a dispersion or evaporation. They characterise this gas as being impossible for humans to "catch" (definition A.4.c. in the OED for the word "fugitive" and definition A.3.a. for the word "volatile" identified as a synonym of "fugitive" in the OED).

In extract (19), the scientists focus on the irreversible aspect of the ESCAPE of FUGITIVE methane from the planet. We can understand the dangerous characteristics of the FUGITIVE because of the nature of this sub-type of gas, as indicated in the OED. The scientists define the danger according to the consequences of this ESCAPE which they express through the FORCING scenario (see Chapter 7). The ESCAPE OF THE FUGITIVE leads to its FORCED INTERACTION with climate. Unlike the RUNAWAY scenario-version which describes a complete lack of control over the ESCAPEE (see extract 16), the FUGITIVE scenario-version in (19) results in an INTERACTION with climate. This FORCED INTERACTION is perceived as dangerous (e.g., like two ill-intentioned escapees interacting together) because it increases warming. The scientists use the scenario to emphasise the necessity to prevent the FUGITIVE from ESCAPING or to limit the extent of the ESCAPE of this type of gas (according to hypothesis following experiments and scientific models).

5.3.3. The CAPTURE- SEQUESTRATION scenario

Other scenarios convey more optimistic views on the effect of the DAMAGED CONTAINER: solutions are identified as different ways to CONTROL and CONTAIN THE LOST CONTENT. In such cases, the LOSS of the CONTENT is not perceived as irreversible: metaphor users focus on the possibility of CATCHING BACK the CONTENT through the CAPTURE and SEQUESTRATION scenario. The solutions discussed in the following extracts do not aim at FIXING THE DAMAGED

CONTAINER but at reducing its DAMAGING EFFECT by preventing additional ESCAPE/ RELEASE:

> (20) NEW - The DTI (Department of Trade and Industry) is expected, possibly as early as this week, to launch a national consultation on **capture and storage - or sequestration** - of carbon dioxide from coal and gas-fired power plants. *The Observer* August 1, 2004 North Sea burial for greenhouse gases: New wave of marine-based solutions to global warming BYLINE: Juliette Jowit, (my addition in parenthesis)

> (21) POL - And by investing in energy efficiency, renewables, **carbon capture**, **clean** fuels and new environmental technologies, I want Britain to lead in **carbon-free** vehicles, **carbon-free** homes and **carbon-free** industry. 24/09/2007 Leader's speech, Bournemouth Gordon Brown (Labour)

> (22) ENV - Debate at Milan has focused on the detail. NGOs, and many counties, want rules to prevent the planting of genetically-modified trees or invasive alien species. They want to ensure the increases in carbon **sequestered** are genuine and that communities affected by schemes are properly consulted. *Friends of the Earth*. Kyoto agreement on climate change gets nearer 09 December 2003

> (23) SCI – The 140-kyr **residence** time of carbon in Earth's exchangeable **reservoirs** suggests that the **liberation** of a substantial quantity of isotopically light carbon from an external, deeply buried source should have a long imprint on oceanic and atmospheric $\delta^{13}C$ (approaching the residence time) until the excess carbon is ultimately **sequestered back** into the long-term sedimentary carbon **reservoir** by weathering reactions. *Nature* volume471, pages349–352 (17 March 2011) Eocene global warming events driven by ventilation of oceanic dissolved organic carbon, Philip F. Sexton, Richard D. Norris, Paul A. Wilson, Heiko Pälike, Thomas Westerhold, Ursula Röhl, Clara T. Bolton & Samantha Gibbs

In these extracts, the ESCAPE/RELEASE is perceived less dramatically, it is described as a progressive movement outside the CONTAINER rather than a sudden and immediate LOSS of its CONTENT, potentially leading to a lack of control over the CONTENT. The metaphor users focus on the need to CONTAIN the remaining CONTENT to avoid a complete ESCAPE/ RELEASE.

The link established in (20) between the actions CAPTURE and SEQUESTER favours a more concrete perspective on the process: the SEQUESTRATION is defined as resulting from the CAPTURE which metaphorically simplifies the process, pictured as a physical control over the CONTENT. However, the journalist focuses on the uncertain effect of such a CAPTURE/ SEQUESTRATION because she describes the need for "consultation" on this process.

The SEQUESTRATION defines a CONTAINMENT that is expected to withstand time: the results from the BNC associate "sequester" with long lasting situations, "The British reader is likely to have been spared certain of the varieties of suffering which are spoken of in the writings of Kundera and Klima, where a joke, or no joke, or nothing whatever, can *sequester you for years* from the people you grew up with" (token: A05-29679726), and "At this time, Richard Baxter requested the favour of being restored to his flock in Kidderminster. He had officially lost his pastorate as part of the restoration agreement with King Charles in which positions and property *sequestered* during the Commonwealth were restored" (token: ALK-38271064). The resistance of the CONTAINER is identified as a security: the CONTENT can cause danger and therefore needs to be controlled.

The stance of the former UK Prime Minister in (21) is more straightforward: on the one hand, he establishes that the CAPTURE OF DAMAGING CONTENT (i.e., carbon) would help to replace it by a CLEAN CONTENT (i.e., "*clean* fuels") –which reveals a conceptualisation of pollution as DIRT– and on the other hand, this CAPTURE is expected to lead to the complete disappearance of the DAMAGING CONTENT in Britain ("carbon-free"). The process is perceived through an almost eulogistic description of its effect (see Chapter 4) because the CAPTURE is expected to lead to a *clean* environment. This CAPTURE is also associated with British leadership, which emphasises the positive picture displayed by the politician.

This conceptualisation is however questioned in (22). *Friends of the Earth* focus on environmental decisions, including CARBON SEQUESTRATION. This depiction raises doubt about the positive effect of the CONTAINMENT on the environment because of the impact of other related decisions such as the reliance on "genetically-modified trees" and "invasive alien species". This reliance leads environmentalists to question the effective SEQUESTRATION of carbon because of the uncertain features of the CONTAINERS produced by humans. For example, the characterisation of a potential CONTAINER as INVASIVE gives rise to assumptions about the evolution of this CONTAINER. It can, in turn, become a FREE element whose ESCAPE cannot be controlled by humans.

In (23), the identification of CONTAINING RESERVOIRS adds more characteristics to the CONTENT. It downplays the qualification of the CONTENT as

dangerous and highlights the practical effect of SEQUESTRATION, picturing the CONTENT as an element whose ESCAPE naturally results in a subsequent CONTAINMENT. The definitions in the OED for the word "sequester" offer a chemistry-related meaning of the word which may be relevant to discuss. Definition (5) of the OED explains chemical "sequestration" as the forming of a stable complex or the removal of this complex from a chemical solution. This definition helps us to understand the distinction in (23) between "sequestration" and "reservoir" because the latter expression suggests a subsequent REMOVAL that is made possible following the SEQUESTRATION (in the OED, the word "reservoir" is defined as "a part of an apparatus in which a liquid or gas is contained"; definition 3.a.). The characterisation of the ESCAPE as a LIBERATION highlights the possibility for carbon of "behaving" without restriction. The CONTAINMENT is perceived as a natural process ("ultimately sequestered back"). The scientists focus on this natural process allowing the LIBERATION OF THE CONTENT FROM THE RESERVOIR ("The 140-kyr *residence* time"). The RESERVOIRS are "exchangeable" which means that the LIBERATION is temporary and leads to a different CONTAINMENT IN ANOTHER RESERVOIR. The natural characteristics of this LIBERATION/CONTAINMENT are emphasised by the description of the RE-SEQUESTRATION of "excess carbon". Hence, the LIBERATION allows the ocean and the atmosphere to get access to the CONTENT and to RE-SEQUESTER THE EXCESS CONTENT IN RESERVOIRS. The consequences of these sequential ESCAPE/SEQUESTRATION are still described as leaving an "imprint" on the patterns of the oceans and the atmosphere.

5.4. Summary

This chapter has established two main narratives within the perspective describing the deterioration of nature. Climate change is metaphorically pictured as a deterioration of nature which can either involve a DAMAGED BODY narrative or a DAMAGED CONTAINER narrative. The DAMAGED BODY narrative identifies climate change as an ILLNESS or WOUND preventing THE BODY from functioning competently. The DAMAGED CONTAINER narrative identifies climate change as producing a DAMAGED ZONE preventing the CONTAINER from fulfilling its protective functions.

On the one hand, metaphor users link climate change to human bodily experiences. Nature is pictured as a BODY whose VITAL ORGANS are endangered by climate change (e.g., the LOSS of the LUNGS). Consequently, the BODY becomes SICK which involves different types of ILLNESSES and different degrees of PAIN. The narrative includes a MEDICAL SUPPORT scenario which focuses on specific MEDICAL EQUIPMENT related to the dysfunction of particular VITAL ORGANS. The BODY can also suffer from a WOUND which has been inflicted by an AGGRESSOR (i.e., pollution). We have also shown that metaphor users focus on the common ground existing between ORGANS/ DISEASES and climate change. The LUNGS source concept is relevant in our corpus because its damage can be pictured as INHALATION. The INHALATION OF DANGEROUS GAS recalls the damaging effect of such an inhalation on the humans' lungs.

On the other hand, the deterioration of nature involves images of a CONTAINER (i.e., the Earth, the atmosphere, the oceans, industries) which has either been DAMAGED by climate change or has DAMAGING effects. The progressive danger of the phenomenon can be perceived as a LOSS of the CONTENT. The description of ESCAPING CONTENT conveys a dramatic view which links this ESCAPE/RELEASE to the cause of climatic disasters. The ESCAPEES can be identified as RUNAWAYS or FUGITIVES. These two qualifications ascribe a lack of control over the ESCAPEE (i.e., climate change, temperatures, and gas) to humans' lack of attention. Alternatively, the CONTENT (i.e., gas) can be purposefully RELEASED from the CONTAINER: the resulting disaster attributed to this RELEASE provides ground for the metaphor users to highlight the inappropriateness of such an action. The consequences of the DAMAGED CONTAINER can be perceived less dramatically, focusing on existing solutions enabled by the process of CAPTURE/SEQUESTRATION. The related descriptions establish the concrete or uncertain aspects of the process.

In the next chapter, we discuss the perspective related to the materialisation of pollution. The two main narratives depict pollution as TRANSFORMING THE EARTH-HOUSE or as leaving a DANGEROUS TRACE. We show that the materialisation of pollution helps metaphor users to present a concrete picture of the effect of emissions on the environment.

Chapter 6: Perspective of excessive pollution: Materialisation of pollution

6.1. Introduction

Climate change narratives can emphasise the extent to which pollution can alter the environment. The metaphor users rely on the metaphorical conceptualisation of pollution as a material entity. The materialisation produces a concrete image of an abstract target concept that comprises a wide range of possible referents. These referents may not be directly discernible and cannot be attributed specific identifying features. The materialisation defines pollution in relation to the role it plays in the evolution of climate change. The production of a material entity on the Earth is identified as the cause of disasters. The metaphor users' argument is grounded in descriptions of the human origin of this material entity.

The first narrative which can be related to this perspective involves the TRANSFORMATION OF A NATURAL HOME into a DANGEROUS HOUSE. The HOUSE concept takes into account humans' role and place within the HOUSE. Some scenarios emphasise the DANGEROUS LIVING CONDITIONS within the HUMAN-MADE CONTAINER. This conceptualisation gives rise to dramatic images of the ways climate change affects human life. These scenarios highlight the CLOSED and WARM features of the CONTAINER. The features are presented according to their unsuitability for human life.

The competing narrative about excessive pollution depicts the target domain as a DANGEROUS FOOTPRINT. The scenario associated with this narrative shows the SPACE on which more FOOTPRINTS can be added. This conceptualisation emphasises the DIRTY features of the FOOTPRINT which leads to particular expectations regarding the need to CLEAN it. Consequently, metaphor users can distinguish different levels of pollution identified as different SIZES OF FOOTPRINT.

These narratives picture the detrimental effect of pollution and establish a concrete process to remove the material entity causing climate change.

6.2. The narrative of the NATURAL HOME becoming a DANGEROUS HOUSE

6.2.1. The EARTH AS A GREENHOUSE scenario

The TRANSFORMED HOUSE narrative in climate change discourse helps metaphor recipients to identify the DANGEROUS aspects of the TRANSFORMED HOUSE. The metaphor users rely on the source domain GREENHOUSE as an exemplary model of the extension of the CONTAINER metaphor. Its distinctive features are related to its BOUNDARIES delimiting a specific space. The heat accumulated within these BOUNDARIES distinguishes the space among other delimited spaces (e.g., a room).

The source domain of the scenario has been exploited in various ways: on the one hand, its use in climate change discourse extends the delimited space to the whole Earth, and on the other hand, the characteristics of its CONTENT have been generalised to include all planetary species. Indeed, the referent of the source domain GREENHOUSE provides adapted temperatures to particular plants allowing them to grow (the metonymical expression *green* specifies *greenhouse*, see Chapter 4). The mapping with the target domain POLLUTION extends the BOUNDARIES of the source domain to picture Earth species as its CONTENT. This mapping shows that the temperatures provided by this CONTAINER are not adapted to this general CONTENT.

Romaine (1996) identifies the metaphor EARTH AS A GREENHOUSE (1996: 176; see also Deignan, Semino & Paul 2019: 392) leading to the conceptualisation PEOPLE AS PLANTS (1996: 181). This analogical reasoning produces two related arguments: first, the identification of people as PLANTS emphasises that the GREENHOUSE does not provide adapted temperatures to every element it CONTAINS, i.e. the distinction between PLANTS that grow in a GREENHOUSE and PLANTS that grow outside: humans do not benefit from being in a GREENHOUSE and are thus identified as PLANTS which are supposed to grow outside. Second, the interrelation between EARTH AS A GREENHOUSE and PEOPLE AS PLANTS relies on the identification of THE EARTH AS A HOME (Romaine 1996: 181; see Chapter 4). These

arguments grounded in the use of the EARTH AS A GREENHOUSE scenario are of particular interest. The occurrences we have identified distinguish a former PLEASANT aspect of the HOME (see Chapter 4) and a DANGEROUS TRANSFORMATION OF THE HOUSE because of climate change. This is illustrated in the examples below:

> (1) NEW - Without needing to be prompted by the weekend's collapse of Beachy Head, which the Environment Agency said was climate change-induced, Government scientists have quietly started to monitor and bring together a mass of small and large events, both in the natural world and in society, which may be the first signs of a hotter planet. Some of these are already strongly suggesting that climate change is no longer a theoretical calamity predicted by the supercomputers of the Met Office, but is **already with us**. (…) The first indications, certainly from the evidence assembled about the behaviour of birds, plants and insects, is that **the greenhouse effect is now here**. *The Independent* January 13, 1999, Wednesday Early bird is key to global warming BYLINE: Michael McCarthy
>
> (2) ENV - The Convention sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognises that the climate is **a shared global resource**. Its stability can be **affected** by industrial and other emissions of carbon dioxide and other **greenhouse** gases. *Friends of the Earth*. Climate talks – Nairobi 31 October, 2006
>
> (3) SCI - HCFC-22, which is a leading potential substitute for other CFCs because of its relatively low capacity to **destroy** ozone, has a GWP of 810, much higher than the **naturally occurring greenhouse gases**, but lower than CFC-11 (4,000) and CFC-12 (10,000)- the two most commonly used CFCs that it might **replace**. *Nature* volume344, pages529–531 (05 April 1990) Relative contributions of greenhouse gas emissions to global warming Daniel A. Lashof & Dilip R. Ahuja

The EARTH AS A GREENHOUSE scenario establishes the TRANSFORMATION of the HOUSE whose characteristics are becoming more and more unpleasant following the addition of gases. The scenario also involves the image of a SHARED HOME, discussed in Chapter 4. The initial characteristics of the SHARED HOME, before its TRANSFORMATION, display pleasant features that humanity can enjoy when the amount of gases is limited, stabilising the "effect" at its necessary level. In contrast, its dangerous level results from the unlimited amount of gases.

In (1), the journalist describes the evolution of the natural effect towards a *greenhouse effect*. This evolution is documented in the extract by reference to scientific findings ("the Met Office"; "evidence assembled"). The journalist describes the previous uncertainty and misunderstanding about climate change ("a theoretical calamity") which

raised doubts about the reality of this TRANSFORMATION. These doubts are contradicted in the extract through the description of climatic events and "evidence assembled about the behaviour of birds, plants, and insects" which are cited as exemplary consequences of the TRANSFORMATION. The TRANSFORMATION is exclusively perceived through negative features ("first signs of a hotter planet") and is characterised by the EARTH AS A GREENHOUSE scenario ("already with us"; "the *greenhouse effect* is now here"). Hence, the journalist denies the existence of a natural effect in the recent past (i.e., the characteristics of the SHARED NATURAL HOME) and attributes the recent and current environmental characteristics to the detrimental evolution of the *greenhouse effect*, relying on science. In this description, the TRANSFORMATION OF THE HOUSE has gone unnoticed and its present stage presents enough features with the GREENHOUSE concept to enable the journalist to endorse the conceptualisation of the TRANSFORMED HOUSE as a GREENHOUSE.

In (2), the environmentalists perceive the TRANSFORMATION OF THE HOUSE as resulting from the addition of damaging MATERIAL ("gases"). The description focuses on the NATURAL HOME which still prevails, but the MATERIAL OF THE HOME is affected by pollution ("shared global resource"). The stance aims at criticising industries and polluters ("affected by industrial and other emissions") whose activities enable the TRANSFORMATION OF THE HOUSE INTO A DANGEROUS HOUSE. *Friends of the Earth* rely on the image of the SHARED HOME to attribute responsibilities for the TRANSFORMATION to particular INHABITANTS, i.e. polluters. This criticism is effective because the description of the SHARED HOME involves global consequences despite different responsibilities.

In (3), the cancellation of the natural characteristics of the HOUSE ("naturally occurring *greenhouse* gases") is perceived as the result of the DESTRUCTION of the FORMER MATERIAL OF THE HOUSE (i.e., ozone) which is caused by the addition of NEW (DANGEROUS) MATERIAL (i.e., CFCs). The scientists establish a gradation involving different kinds of MATERIAL. The former, natural MATERIAL has no DESTRUCTIVE features ("naturally occurring *greenhouse* gases") because it enables human life by providing appropriate temperatures. This natural MATERIAL has been DESTROYED by another MATERIAL, CFCs. The negative features of this NEW MATERIAL can be inferred from the need to REPLACE it, from the references to its

DESTRUCTIVE effect on ozone, and on temperatures (i.e., Global Warming Potential, GWP). The addition of this MATERIAL is associated with climate change. Scientists focus on the MATERIAL which can REPLACE this DANGEROUS MATERIAL, HCFC-22. HCFC-22 is characterised by its NON-DESTRUCTIVE EFFECT. However, the comparison involving the NATURAL MATERIAL, the DANGEROUS MATERIAL, and the NON-DESTRUCTIVE MATERIAL raises doubts about the benefits of the REPLACEMENT: the NON-DESTRUCTIVE MATERIAL still produces warming (GWP) and this potential is higher than the NATURAL MATERIAL but lower than the DANGEROUS MATERIAL. The scientists describe the NATURAL HOME as DESTROYED but are searching for MATERIAL TO BUILD A HOUSE which would be less dangerous for its INHABITANTS. The present DANGEROUS HOUSE is not identified as a GREENHOUSE (*greenhouse* qualifies the MATERIAL OF THE NATURAL HOME, "naturally occurring") and is exclusively described with reference to its DANGEROUS MATERIAL.

The different characteristics of the HOUSE and the different descriptions of the TRANSFORMATION might be misleading for metaphor recipients. Deignan, Semino & Paul (2019: 392-4) illustrate the misunderstood features of the *greenhouse effect* metaphor which produces conceptualisation of pollution as forming a layer around the earth while this effect is evenly dispersed in the atmosphere.

Here, we focus on the TRANSFORMATION. In descriptions of the natural *greenhouse effect*, the features of the source domain are adapted to fit the description of a CONTAINER filled with humans (HUMANS AS PLANTS) providing adapted temperatures. In descriptions of the non-natural *greenhouse effect*, the features of the source domain establish a PLANT CONTAINER to highlight its unsuitability for humanity as its CONTENT (humans are not plants).

The role of humans as the INHABITANTS can be highlighted through scenario-versions informing about the CONSTRUCTION or DECONSTRUCTION OF THE HOUSE, as in:

> (4) NEW - The summit faces the threat from the US Congress not to cut US greenhouse gas emissions until the developing nations agree to limits on their own, much lower emissions. For example, the US emits 5.4 tonnes of CO2 per head of population, while the UK emits 2.6 tonnes (a typical figure for Europe). Argentina, the conference host, emits 1 tonne per head, China 0.7 and India 0.3.

> In effect, Congress is saying that **the US and Europe have booked all the 'space'** in the atmosphere for greenhouse gases, leaving next to none for the poor world. *The Guardian* October 29, 1998 The great leapfrog forward BYLINE: Fred Pearce

> (5) ENV - The report (IPCC) also covers the range of **anthropogenic greenhouse gases** and other factors that drive climate change. *Friends of the Earth*. Stark findings on climate change 02 February 2007 (my addition in parenthesis)

The emphasis on the human origin of the TRANSFORMATION is effective in establishing the link between human activities and climate change. This link helps the metaphor users to associate HUMAN CONSTRUCTION with the possibility of DE-CONSTRUCTING THE HOUSE.

In (4), the ADDITION OF MATERIAL is identified as the SPACE BOOKED BY THE OWNERS OF THE MATERIAL (the US and Europe). This picture originates in the journalist's description of the conclusions of the United Nations' Climate Change Convention. He highlights the metaphorical meaning of "space" with inverted commas to signal that "space" is used as a familiar term to illustrate these conclusions. The countries which do not OWN any MATERIAL can be left HOMELESS ("leaving next to none to the poor world"), which highlights the journalist's criticism: the US and Europe are blamed for not making sufficient emission reduction. The journalist pictures the US and Europe as performing a kind of polluting COLONISATION ("booked the space") because they are ADDING UP their own DAMAGING MATERIAL (gas) around other regions of the Earth (see Chapter 7; see also Romaine 1996). The depiction of the extravagant amount of pollution from the US and Europe as *booking all the space* and the comparison with the pollution from other countries involved in the Convention (Argentina, India, China) define this pollution as an egotistical move from these two areas which results in the HOMELESSNESS of other regions. This criticism is aimed at the US stance on reduction which asks developing countries to lower their emissions before the US agrees to reduce its own. Hence, the scenario ridicules this stance which, consequently, appears absurd.

In (5), the addition of the adjective "anthropogenic" to qualify the MATERIAL OF THE HOUSE might seem redundant. Indeed, the source domain GREENHOUSE defines a container manufactured by humans. We can infer that the mapping with the target domain POLLUTION comprises this "+human" feature because this feature is

shared by both domains. However, the specification "anthropogenic" has a role in the argumentation: by reiterating the human origin, *Friends of the Earth* focus on a particular MATERIAL, produced by humans, which has dangerous effects on the climate. This MATERIAL is opposed to the NATURAL MATERIAL, which can also be qualified with the source domain GREENHOUSE (see extract 3), but whose effect is beneficial for humans. Hence, this specification is effective in identifying humans as the BUILDERS of the TRANSFORMED HOUSE. The mapping of the source domain GREENHOUSE and the target domain POLLUTION depends on the identification of the gas as pollution: this mapping can rely on the "+human" feature of the source (POLLUTION as the target) but it can also hide this feature to define a natural process (natural gas). *Friends of the Earth* endorse the scenario establishing the findings from the IPCC report and advertise its stance on pollution.

Some scenario-versions focus on the unsuitability of the TRANSFORMED HOUSE for human life through particular characteristics related to the DIRT it CONTAINS, as in:

> (6) NEW - It is recognised that global warming will be much harder to curb than CFCs, but it has also been assumed that the Montreal formula would serve as a model for any convention on global warming. This too, appears to be in doubt. The US appears unwilling to accept anything other than a loose statement of principle, and also argues that developing countries should take responsibility for avoiding future environmental damage. The developing countries respond that industrialised nations produce most of the **greenhouse gases**, and should therefore pay for **the clean-up**. *The Guardian* October 5, 1990 Environment: Chaos threatens climate conference BYLINE: IAN GUEST

> (7) ENV - Mark Wakeham from Greenpeace said: "This report shows that energy efficiency measures and renewable energy sources can deliver the large reductions in **greenhouse pollution** required without the dangers associated with nuclear power. It's time to shift from **dangerous and dirty** fuel sources – coal and nuclear – to a **clean** energy future." *Friends of the Earth*. Nuclear energy no solution to climate change 08 September 2005

> (8) SCI - The question now is how the trend towards **cleaner** air will affect global temperatures. "It is clear that **the greenhouse effect** has been partly masked in the past by **air pollution**," says Macke (a meteorologist at the Leibniz Institute of Marine Sciences in Kiel, Germany). Wild (scientist) is investigating just how much was masked. He has yet to publish his results but he estimates that, until 1990, air pollution protected us from at least 50% of the warming that would have otherwise occurred. *Nature* volume435, page135 (12 May 2005) Cleaner skies leave global warming forecasts uncertain Quirin Schiermeier (my addition in parenthesis)

We can compare this scenario with the EARTH AS A TENANCY scenario discussed in Chapter 4. Unlike extracts 3 and 5 discussed in this chapter, pollution is here not perceived as the dangerous MATERIAL OF THE TRANSFORMED HOUSE but as an accumulation of DIRT WITHIN THE SHARED HOME.

In (6), the journalist reports the discussions which happened during a Climate Change Convention. He focuses on the different responsibilities of different countries for the accumulation of DIRT. The main argument is about the SHARING CONDITIONS OF THE HOME: he refers to developing nations' stance which contrasts the DIRTY (i.e., developed nations) and CLEAN behaviours of the INHABITANTS. This comparison provides grounds for the attribution of the CLEANING tasks to the DIRTY INHABITANTS. This conceptualisation can be compared to the POLLUTION AS BOOKING SPACE scenario-version (in 4): pollution is perceived as a DEGRADATION OF THE SHARED HOME by some of its INHABITANTS. The journalist's argument legitimises climate actions which are viewed as a sensible response and as an ordinary and concrete task. He accordingly refers to emission reduction by means of the CLEAN UP scenario which involves an additional feature related to the profitable result of such actions. However, he does not explicitly argue in favour of the distribution of the tasks. He distinguishes the arguments from the US and from those of the developing countries. This distinction helps him to emphasise the "chaos" (in the title) of the climate change conference which, according to him, has resulted in a strong opposition between the US and developing countries, preventing any agreement on emission reduction.

In (7), *Friends of the Earth* characterise the DANGEROUS MATERIAL AS DIRT. First, they identify this MATERIAL as "pollution", which suggests that *greenhouse gases* are exclusively perceived through their negative, anthropogenic features. Second, the environmentalists argue in favour of emission reduction and promote the replacement of polluting gases with "*clean* energy". This replacement is conceptualised as a CLEANING TASK: the use of CLEAN MATERIAL improves the SALUBRITY OF THE HOUSE because this MATERIAL is opposed to DANGEROUS AND DIRTY MATERIAL ("dangerous and *dirty* fuel sources") whose role in the TRANSFORMATION OF THE HOUSE has an impact on the SALUBRITY. Hence, the REMOVAL OF DANGEROUS AND DIRTY MATERIAL is not described as a CLEAN-UP but the replacement by CLEAN MATERIAL is expected to lead to a

CLEAN HOUSE ("to a *clean* energy future"). The description of the CLEAN HOUSE promotes the replacement of gas by CLEAN energy.

In (8), the scientist relates the TRANSFORMATION OF THE HOUSE to "pollution". This TRANSFORMATION does not result from the DESTRUCTION OF THE NATURAL HOME. The *greenhouse effect* is opposed to "air pollution": the source domain GREENHOUSE is not used for its "+human" feature compared to "pollution" which is defined by its unnatural origin. The scientist focuses on the interaction between the NATURAL and MAN-MADE MATERIAL. The latter is described through its "masking" properties which leads the scientist to question the impact on the NATURAL MATERIAL. Here, the CLEAN features of the MATERIAL ("*cleaner* air") are perceptible following the REMOVAL OF THE MAN-MADE MATERIAL, which implicitly characterises the latter as DIRT. The scientist suspects that the addition of DIRT on a CLEANER MATERIAL has altered the beneficial features of this MATERIAL, i.e. the reduction of pollution may still lead to an increase of temperatures.

The POLLUTION AS DIRTY MATERIAL scenario can be exploited in descriptions of the detrimental effect of the DIRT on the INHABITANTS' health, as in the example below:

> (9) NEW - Our psyche cannot cope with the idea that the summer months are naturally, well, hot. Certainly, the concept of the changing seasons, bringing snow in winter and heat in summer, are unfamiliar to our newspapers. Is there any other culture which, during the summer months, would treat hot weather as a news story? It used to be straightforwardly along the lines of "Phew, what a scorcher!" but we now live in more sophisticated times and the focus has changed to reporting hot weather by proxy. In the mid-Seventies it was the drought; during the late Eighties it was **the greenhouse effect**. In 1994, some reports suggest that we are being **poisoned** by the poor quality of the air we breathe and that **our hospitals are besieged with people in dire distress from asthma**. *The Independent* August 5, 1994, Friday The hot British summer: phew what a story BYLINE: TOM WILKIE

The relationship between the DANGEROUS AND DIRTY MATERIAL and the TRANSFORMED HOUSE characterises this HOUSE as unsuitable and destructive for its INHABITANTS. In (9), the journalist uses dramatic images – which represent his interpretation of existing news reports – to criticise journalistic alarmism regarding the topic of climate change. The lethal feature of the GREENHOUSE is expressed through the identification of a POISON, and this feature exemplifies journalistic exaggeration. However, the stance of the article is not sceptical but aims at illustrating the

misunderstanding of the topic. This misunderstanding leads to unjustified alarmist claims in the media. The link between POISON and real-life events ("asthma") establishes ill-documented descriptions attributed to other journalists who use the scenario to exaggerate the role of climate change in reporting people's experience of health issues. The association of asthma and climate change emphasises the dramatic images presented by the media: these images rely on general conclusions from journalists following the observation of a phenomenon (i.e., people in hospitals) which may not be entirely caused by climate change. Additionally, the BESIEGED metaphor to refer to a smaller-scale phenomenon ("hospitals") echoes the COLONISATION aspect involved in the TRANSFORMED HOUSE narrative discussed before (in extract 4; see Chapter 7). This conceptualisation emphasises the journalists' exaggeration in other media and criticism of the claims reported in this article.

6.2.2. The POLLUTION AS A TRAP scenario

The TRANSFORMED HOUSE narrative involves additional plots related to the ENCIRCLING aspects of the EARTH-CONTAINER. The possibility of INHABITING a NATURAL PLEASANT HOME is highly questioned because the human capacity to EXIT THE BOUNDARIES BUILT OUT OF THE DANGEROUS MATERIAL is altered. The materialisation of pollution is expressed by its detrimental and dangerous characteristics changing the TRANSFORMED HOUSE into a human TRAP (see also Deignan, Semino & Paul 2019: 394).

The results provided by the BNC (from *SketchEngine*, Kilgarriff 2003) for the term "trap" show that the verb (the scenario mainly involves the use of "trap" as a verb rather than a noun) is used in situations where characters are unable to move freely, which leads to dangerous or fatal resolutions. The results show that the verb frequently collocates with words such as "prey", "animal", "poison", "shoot", and "kill". For example, the contextual information provided for the collocation of "trap" and "passenger" (identified as a frequent collocation) mainly depicts scenes of accidents, as in: "There had been a series of rumours about accidents: pods which malfunctioned on impact, leaving their passengers *trapped* and helpless" (token number: FSE-110232820).

The scenario can depict the detrimental consequences of the TRAPPING process through the expression *absorb*. The occurrences describe THE TRANSFORMATION OF THE HOUSE INTO A TRAP, characterised by its dangerous features, as in:

> (10) NEW - Oil, petrol and coal produce carbon dioxide when they burn. This acts as an **invisible atmospheric insulator, trapping** the sun's heat **like the panes of a greenhouse**. *DAILY MAIL* August 8, 2002 UNFROZEN IN TIME BYLINE: Michael Hanlon

> (11) SCI - Estimates of relative contribution to additional **greenhouse forcing** during particular periods do not fully take into account differences in atmospheric residence times among the important **greenhouse** gases. In general, *Ai* is a function of **the concentration of gas and other greenhouses gases** because of **saturation** and overlap of the respective **absorption** bands. *Nature* volume344, pages529–531 (05 April 1990) Relative contributions of greenhouse gas emissions to global warming Daniel A. Lashof & Dilip R. Ahuja

In (10), the journalist focuses on the ENTRAPPING features of the TRANSFORMED HOUSE and uses the POLLUTION AS A TRAP scenario to emphasise the effect of the gas. Pollution is materialised so that it prevents MOVEMENT OUTSIDE THE CONTAINER. The progressive addition of heat within the TRANSFORMED HOUSE, resulting from the addition of DANGEROUS MATERIAL, represents a threat because it cannot be EXTRACTED FROM THE CONTAINER (see BNC results above). The journalist relies on this conceptualisation to show that reductions are necessary. Additionally, the ENTRAPPING feature of the TRANSFORMED HOUSE is emphasised through explicit reference to the features of the source domain GREENHOUSE through the use of the simile "like the panes of a greenhouse". This simile stresses the SOLID feature of the TRANSFORMED HOUSE ("panes") which provides additional images of the danger associated with its TRAPPING characteristic.

In (11), the inclusion of heat as a CONTENT of the TRANSFORMED HOUSE is described through the process of ABSORPTION: it characterises the CONTAINMENT of the heat and the arduous process this CONTAINMENT requires for its CONTENT to be released. The heat is metaphorically described as a CONTENT that keeps being added, leading to a SATURATION OF THE CONTAINER. According to the definition of the OED, the scientific meaning of the word "saturation" refers to the maximum amount of a substance that another substance can contain

(definition 3.a.). In the context of climate change, the SATURATION scenario-version emphasises the CONTAINING CAPACITY of the atmosphere. This conceptualisation provides additional images of a human-made CONTAINER that is OVERFLOWING with gas (and which may break or burst, eventually endangering life). This dramatic image is reinforced by the FORCING scenario (see Chapter 7) which describes the FORCED INTERACTION between the gas and the atmosphere, which may increase global warming (in the title). The scientists perceive the CONTAINMENT as a gradual danger for the environment.

This interpretation is relevant to our analysis of the POLLUTION AS A LOCKED CONTAINER scenario-version in climate change discourse. The metaphor users depict the phenomenon through images of a deliberate LOCKING WITHIN THE CONTAINER, as in:

> (12) NEW - Could the oceans **fight back**? Plant life is **hailed as lock and key** to global warming (…) Life in the ocean has the potential to help to prevent global warming, according to a report published today. Marine plant life sucks 2 billion tonnes of carbon dioxide from the atmosphere every year, but most of the plankton responsible never reaches the seabed to become a permanent carbon store. *The Times* October 14, 2009 Wednesday BYLINE: Frank Pope

> (13) SCI - To relate this value of Δage to the Herron–Langway model, we assume that gases are cut off from mixing with the atmosphere at a specified density known **as the locking density**(ρ_L). *Nature* volume391, pages141–146 (08 January 1998)Timing of abrupt climate change at the end of the Younger Dryas interval from thermally fractionated gases in polar ice Jeffrey P. Severinghaus, Todd Sowers, Edward J. Brook, Richard B. Alley & Michael L. Bender

> (14) ENV - Domingo Lechon, Friends of the Earth Mexico said: "Our concerns on a non-transparent process are becoming reality and it seems that the Mexican government will become responsible for **killing** the Kyoto Protocol. This is not what the Mexicans want, and it is not what the world wants. We need real solutions. Mexico must not follow Denmark's bad example and avoid by all means an exclusive, un-transparent and undemocratic process that leads to **lock-in of dangerous climate change** of which we will all suffer." *Friends of the Earth*. Rich countries must reject any secret text that puts in place process that could **kill** Kyoto 03 December 2010

The metaphorical expression *lock* in these extracts establishes that the CONTAINMENT can result from deliberate human actions. The results provided by the BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "lock" (as a verb) show a distinction that is similar to the distinction established in our discussion of *escape* and *release* in Chapter 5. The verb "lock" is often used to characterise voluntary actions performed by humans, according to the collocates provided by the BNC.

Comparatively, we have shown that "trap" is used in situations where the containment is endured by the characters. The results for "lock" include collocates whose referents define ordinary objects used by humans, for example "door", "room", "window", and "cupboard". The voluntary aspect of the "containment" is explicit in the contextual information displayed by the BNC, for example: "I thought the old man had deliberately *locked* me out" (token umber: GWB-53395624).

In (12), the journalist uses the scenario to apply a "+human" characteristic to environmental solutions. We can infer this characteristic from the metaphorical expression *fight back* which provides human capacities to the oceans (see Chapter 7). This focus on the "+human" characteristics of the solutions can explain the nominal use of the metaphorical expression *lock*: the journalist does not provide any information about the advancement of the solutions to emphasise the responsibility of humans who can still choose to CLOSE or to OPEN the CONTAINER. Even though human responsibility is not explicitly mentioned, the personification of the oceans and the identification of "plant life" as objects typically used by humans (*lock and key*) attribute responsibility to humans. The metaphorical phrase *lock and key* relies on the characterisation of "global warming" as a CONTAINER. Humans can use "plant life" to OPEN or CLOSE this CONTAINER: they can still EXIT THE CONTAINER. The journalist presents solutions as concrete, simple actions through the use of this scenario. These solutions are legitimised by scientific findings ("is hailed"; "a report published today") which have prompted the use of the scenario by the journalist. He emphasises the uncomplicated characteristics of the scientific solutions (i.e., relying on plant life).

In (13), the scientists depict the addition of gases as a progressive LOCKING OF THE CONTAINER ("lock-in density"). The atmosphere, as a CONTAINER, is prevented from OVERFLOWING following continuous addition of CONTENT (i.e., gases). Scientists describe the process by which the CONTAINER becomes LOCKED when its CONTAINING CAPACITY (i.e., "density") is reached ("cut off from mixing with the atmosphere"). This scenario-version attributes "+human" characteristics to the process: the LOCKING is perceived as a self-regulation establishing the maximum amount of gas the atmosphere can CONTAIN. This interpretation is also justified by the use of the passive form "are cut off" (with no agent) which illustrates the progressive and automatic aspects of this LOCKING.

In (14), the environmentalists focus on the role of humanity as the CONTENT. They identify climate change as a detrimental CONTENT LOCKED with humans. *Friends of the Earth* rely on the conceptualisation of the EARTH AS A SHARED HOUSE, in which humanity can be LOCKED. This potential future CONTAINMENT of humanity and climate change is reinforced by the qualification of climate change as "dangerous". This conceptualisation criticises Denmark's environmental position which, if it is also adopted by Mexico, will LOCK humanity with the dangerous CONTENT. This criticism is emphasised in the beginning of the extract and in the title of the article: these environmental positions are attributed a CRIMINAL feature because they are blamed for *killing* the Kyoto Protocol (see Chapter 7).

6.2.3. The EARTH AS A HEATED CONTAINER scenario

The POLLUTION AS A TRAP scenario is complemented in our corpus by another scenario characterising human life WITHIN THE TRANSFORMED HOUSE, relying on dramatic conceptualisations. The dramatic features related to the CONTAINMENT of humanity emphasise the warming effect of pollution. This effect is metaphorically extended through the source domain related to COOKING. The EARTH AS A HEATED CONTAINER scenario is used as an exemplary instance of extreme degree of heat and establishes possible consequences of climate change. This is illustrated in the examples below:

> (15) NEW - So is that what we have to look forward to - a miserable choice between **being boiled alive** and massive state intervention in the collective interest of preventing it? Don't despair. The solution lies largely in our own hands. *The Independent* October 21, 2006 Saturday Climate change: taking responsibility BYLINE: JEREMY WARNER

> (16) NEW - If parts of the planet are becoming **like a furnace** because of global warming, then the Arctic is best described as the world's **air-conditioning unit.** The frozen North plays a crucial role in cooling the rest of the planet while reflecting some of the sun's heat back into space. *i-Independent* August 24, 2017 Breaking the ice; Sailing through the Northwest Passage was a near-impossible voyage, but global warming allowed Frank Jordans and his crewmates to cross the Arctic in record time BYLINE: Frank Jordans

> (17) SCI - But I am not aware of any scientist or environmental activist who have ever used the phrase '**runaway** global warming' in the context of Earth (the jargon is usually reserved for the **oven-like** s**uper-greenhouse effect on**

> **Venus**); and, needless to say these **dissembling activists and scientist-hysterics** go unnamed and uncited in Parsons' text. *Nature* volume381, pages384–386 (30 May 1996) Climate reversal Stephen H. Schneider [8]

In (15), the BOIL scenario-version involves different stages of heating resulting in BOILING as its most intensive degree, usually reached to cook food [9]. The implicit role of WATER involved in the interpretation of the metaphor may rely on the common ground between BOILING WATER and CLIMATE CHANGE: the warming of the planet results in the melting of glaciers, which consequently leads to a rise of the sea level. We can infer that an intensive warming leads to a severe sea level rise, which involves images of humans surrounded by water. These images may be part of the interpretation of the metaphorical expression *boil*. The scenario-version emphasises the dramatic evolution of climate change: humans (including the journalist and the readership, "we") are implicitly identified as FOOD being COOKED in BOILING WATER. The passive form "being boiled alive" prevents the identification of the agent responsible for the BOILING. This can possibly be interpreted as a personification of climate change which produces the BOIL. The journalist intensifies the dramatic features of the scenario by describing human suffering. The addition of the adjective "alive" reinforces the agonising characteristics of the situation because it describes humans' painful experience of extreme heat.

The WARMING EFFECT AS BOILING scenario-version is compared to "massive state intervention", which the journalist does not favour ("miserable choice"). This comparison argues that the intervention is as painful as "being *boiled* alive". The criticism is grounded in the possibility of performing individual actions, recommended

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[8] Extract (17) questions the mapping of the source domain RUNAWAY to the target domain EARTH CLIMATE. Here, the scientist argues that the target domain VENUS CLIMATE is more appropriate.

[9] The BOIL scenario originates in Al Gore's film (American politician) which has been released in the same year the newspaper article in (15) has been published. This origin has been acknowledged in *Nature*:

> "As an iconic climate-change image, the 'hockey-stick graph' by geophysicist Michael Mann — showing global temperature change over the past 1,000 years — is up there with the greats. Others include the Keeling curve of changing atmospheric carbon-dioxide concentrations and **the 'boiling frog' metaphor from Al Gore's 2006 documentary *An Inconvenient Truth*"**. Climate science: Denialism deciphered, Dave Reay *Nature* volume538, pages34–35 (06 October 2016)

by the journalist. He uses the WARMING EFFECT AS BOILING scenario-version to deride alarmist beliefs (although this derision does not aim at denying the existence of climate change). These beliefs are contrasted with the promotion of possible actions ("Don't despair. The solution lies largely in our own hands"). The criticism reflects the danger of alarmism ("being *boiled* alive") which can persuade metaphor recipients that actions are not sufficient enough to solve the issue (alarmists may indirectly promote inaction).

In (16), the journalist relies on a different source domain, FURNACE, which also exemplifies a high amount of heat. This scenario-version can be distinguished from the BOIL-version. The FURNACE image points to the possibility of adapting the heat produced to human needs. Even though the heat provided by an OVEN or by a STOVE (implied by the source domain BOIL) can be managed, the referents are ordinarily used to cook food, which requires high degree of heat. The features of the source domain FURNACE are applied to climate change to emphasise humans' ability to lower the temperatures. The journalist exploits this argument with another metaphorical expression which establishes the existence of an AIR-CONDITIONING UNIT. These semantically related metaphorical expressions are used to compare the climatic situations of different regions of the world. While some regions are affected by heat, the colder conditions of the Arctic help to moderate this heat. However, the global effect of climate change has an impact on the colder temperatures of the Arctic, which endangers its role as the AIR-CONDITIONING UNIT. The journalist stresses the necessity of this AIR-CONDITIONING UNIT for human life: he promotes the protection of glaciers.

In (17), the scientist uses the WARMING EFFECT AS AN OVEN scenario-version to describe the warmth on the planet Venus, which prevents life on this planet. This scenario-version aims at criticising Edward Parson, a Professor of Law and Environment[10]. This criticism is a reply to Parson's stance about (supposed) scientific characterisation of the *greenhouse effect* as a RUNAWAY effect.

This scientific characterisation is denied by the author of the article who attributes this RUNAWAY feature to the climatic conditions of Venus. He emphasises the impossibility of applying this feature to the Earth through the use of the OVEN scenario-

[10] Edward Parson's biography is available at: https://www.ucsusa.org/about/people/edward-parson

version. This source domain is effective in illustrating a very high degree of heat which is fatal for humans. Since the warming on earth does not prevent human life, the temperatures cannot be equated to OVEN-LIKE temperatures and the *greenhouse effect* cannot be described as a RUNAWAY effect.

The scientist relies on exaggeration to contradict Parson's claims. He denies the scientific and environmentalist origin of the qualification of earth's climate as RUNAWAY. He also questions the existence of "dissembling activists and scientists-hysterics" who have supposedly coined this analogical interpretation. The characterisation of these scientists as "hysterics" emphasises the absurdity of the comparison between the climatic conditions on Venus and the conditions on earth.

6.2.4. The WARMING AS A BLANKET scenario

The WARMING AS A BLANKET scenario refers to the effects of the addition of gas. This scenario comprises specific features which distinguish its use from the other scenarios that compose the TRANSFORMED HOUSE narrative.

For example, the features of the source domain GREENHOUSE involve a management of the heat within the container with technological devices. The heat of a greenhouse does not increase following the addition of material. However, in our corpus, metaphor users link this ADDITION OF MATERIAL to temperature increase. This interpretation transgresses the features of the source domain GREENHOUSE. Additionally, this interpretation is consistent with the features of the source domain BLANKET (i.e., more blankets produce more heat).

This scenario defines a HUMAN COVER aimed at bringing more heat to the human body. The depiction of climate change re-scales the features of a source domain whose referent is used by a delimited number of humans. The features of the source domain BLANKET also involve the metaphor recipients' individual bodily experience of its referent. This is illustrated in the examples below:

> (18) NEW - Much of it is reflected back as infrared radiation, and a great deal is absorbed by greenhouse gases in the atmosphere - especially water vapour and carbon dioxide - heating the world further, as **under an aerial duvet**. Without this natural process, the earth would be 20C colder, and uninhabitable. Logically, increasing these gases - for instance, by emitting carbon dioxide - raises

temperatures further, **as if adding a blanket to the duvet**. *The Daily Telegraph* October 15, 2014 Wednesday We cannot rest on Mother Nature's laurels BYLINE: GEOFFREY LEAN

(19) NEW - Amid fears of global warming, with the **cold war** gone, it starts to look as if the main legacy of those under-ice voyages will be the warning of a completely different **apocalypse**, equally man-made and equally destructive as the floods and famines of a world **grilled under a blanket of greenhouse gases**. *The Guardian* August 23, 2000 The heat is on: When a group of American tourists turned up at the North Pole on board an icebreaker earlier this month, they found no ice to break. It had all melted. BYLINE: James Meek

(20) SCI - Such a change in sea-ice extent would have global significance, because ice cover of the polar oceans is an important component of the Earth's climate system. It exerts strong controls on the exchanges of energy between atmosphere and oceans at high latitudes. Sea ice has a higher albedo than the open ocean and thus modifies the energy balance of polar regions. It also acts as **an insulating blanket** reducing the transfer of heat from the underlying oceans to the cold polar atmosphere. *Nature* volume389, pages20–21 (04 September 1997) Climate change: Icy message from the Antarctic Eugene Murphy & John King

In (18), the WARMING AS A BLANKET scenario pictures the increasing heat through the THICK feature of the source domain. The semantic field related to BEDDING favours the occurrence of different scenario-versions such as ADDITIONAL LAYERS ("adding") and ADDITIONAL DUVET.

The source domain and its extensions define different levels of BODY WARMTH and their referents adapt the temperatures to the needs of the (individual) body. The unpleasant warmth resulting from climate change is pictured as an unnecessary ADDITION OF LAYERS ("adding a *blanket* to the *duvet*") which highlights a paradoxical human behaviour: it relies on the image of an individual who suffers from the heat but keeps adding BLANKETS over his/her body. The requirement to take off these LAYERS appears as a sensible and simple action.

In (19), the dramatic effects of climate change on glaciers promotes the exploitation of the scenario, conceptualising a BLANKET that gathers enough heat to GRILL humans. The danger related to this GRILLING effect is compared to other dangerous conditions such as "floods and famines" which are depicted as resulting from this effect.

The dramatic stance is also expressed through the conceptualisation of the FUTURE WARMING AS APOCALYPSE and with the reference to the Cold War. This

reference fulfils several functions in the extract: it comically compares two deadly events characterised by the temperatures experienced in the areas in which they take place ("Amid fears of global warming, with the cold war gone"). It also relies on the role played by Americans during both events (as indicated in the title of article). These commonalities are emphasised to place climate change and the Cold War on the same scale regarding the damages they cause(d). Climate change is compared with a WAR regarding its effects on the population (see Chapter 7).

The GRILLING BLANKET scenario-version reinforces the detrimental consequences for humans who are pictured as suffering from a LIFE ENDANGERING HEAT, which is exemplified by the FUTURE WARMING AS APOCALYPSE metaphor. According to the journalist, the disappearance of glaciers ("those under-ice voyages") is as dangerous as other climatic consequences (i.e., extreme heat). The journalist instigates a feeling of urgency in the readership, promoted by the exploitation of the scenario.

In (20), scientists use the source domain BLANKET to describe a beneficial process by which the sea ice can regulate the ocean temperatures. The BLANKET does not characterise the addition of heat: the source domain conceptualises the role of the sea ice through the features of the BLANKET which provide ADJUSTED TEMPERATURES to the human body, and here, to the oceans. The INSULATING characteristic of the BLANKET is also perceived as a beneficial feature when mapped to the target domain "sea ice". This mapping illustrates how the ice layer helps the oceans not to be dramatically affected by the temperatures of the atmosphere. Scientists use the source domain BLANKET for its pleasant features related to heat regulations while journalists use the source domain to describe a dangerous effect of warming.

6.3. The POLLUTION AS A DANGEROUS TRACE narrative

The materialisation of pollution also involves a narrative that focuses on the lasting impact of pollution on the environment. The POLLUTION AS FOOTPRINT(S) scenario, which is associated with the narrative POLLUTION AS A DANGEROUS TRACE, conveys particular features to pollution related to its ability to remain over an area and to be perceptible after a PASSAGE.

The results provided by the BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "footprint" show that it frequently collocates with verbs defining the "footprint" as resulting from an action or movement, i.e. "yield", "produce", "leave". Other collocates determine the visible feature of the "footprint", such as "clear", "large", "evident", "observe", and "find". The referent of "footprint" is a visible trace resulting from an action. According to the contextual information provided by the BNC, the presence of such a trace can be relevant in particular situations because it establishes a link between the entity which has produced the "footprint" and the space this entity has occupied (e.g., "They were like astronauts landing on the moon and finding *footprints* in the dust" token number: ASV-32160739).

According to existing literature, the compound *carbon footprint* is a significant metaphor in climate change communication (Nerlich & Koteyko 2010; Nerlich & Hellsten 2014). Nerlich & Hellsten (2014) investigate the origin of the metaphorical compound and demonstrate that the expression was introduced by climate scientists. The linguists relate the *carbon footprint* and the *greenhouse effect* metaphors because both source domains help the metaphor recipients to have a concrete representation of the impact of pollution. Koteyko, Thelwall & Nerlich (2009) show that *carbon footprint* makes the representation of the management of CO2 more concrete (2009: 30; 39; see also Koteyko 2010: 664). They find that this compound links humans' daily life activities to the consequence of these activities on climate change (e.g., *carbon diet*; *carbon finance*; Koteyko, Thelwall & Nerlich 2009:40). *Carbon footprint* can give rise to sceptical arguments: the linguists analyse the expression *carbon Bigfoot* (2009: 43) which focuses on the entity that left the *footprint* represented by exaggerated characteristics related to his/her/its pollution. The findings in existing literature do not particularly focus on the *footprint* component of the phrase *carbon footprint*. It appears legitimate to study the features of this particular source domain. For instance, a relation between FOOTPRINT and MOVEMENT has been established in our corpus, as in:

> (21) NEW - Climate change: Challenging business: **Footprinting: A step in the right direction:** Interest in carbon labelling has grown since last month's energy white paper told large companies they will have to calculate and reduce their CO2 emissions. *The Guardian* June 27, 2007 Wednesday BYLINE: Tobias Webb
>
> (22) SCI - Sustainability is no longer a fringe topic. Corporations are routinely **taking steps** to reduce their carbon **footprints** and investing in **green** business

> measures. *Nature* volume473, pages149–150 (12 May 2011) Climate economics: Corporate greening falls short Gail Whiteman

The features of the POLLUTION AS STEPS LEAVING FOOTPRINTS scenario-version involve a visible trace that appears as a result of an action, more specifically, as a result of a MOVEMENT. The description of this trace in climate change discourse can identify the MOVEMENT of the entity that left the FOOTPRINT. This conceptualisation establishes the alteration of climate following the MOVEMENT.

In (21), the use of *footprint* as a verb evokes stories of investigation (see Chapter 7) through the depiction of consumers as INVESTIGATORS who analyse the TRACE to keep the entity at the origin of the TRACE (i.e., the marketed product) under surveillance. The journalist describes a process which forces companies to check the amount of carbon particular products have required for their production. This process is expected to lead to a ban on the sale of high-carbon products by certain companies. The images of an INVESTIGATION are inferred from the lexical similarities of *footprinting* and *fingerprinting*, the latter expression being associated with a CRIME narrative (see Chapter 7). The JOURNEY-PATH metaphor in the extract ("A *step* in the right *direction*") involves images of different trajectories: the WRONG PATH is "stained" by unrestrained FOOTPRINTS (i.e., high-carbon products) whereas the RIGHT PATH involves a limitation of these FOOTPRINTS. This conceptualisation criticises companies selling high-carbon products because they do not control their FOOTPRINTS. However, other companies can INVESTIGATE their FOOTPRINTS to reduce pollution.

In (22), the RIGHT DIRECTION is characterised by GREEN business measures permitting the population to avoid leaving any FOOTPRINT (see Chapter 4). The association of corporations' FOOTPRINTS and climate change can establish a WRONG DIRECTION ("reduce their carbon *footprints*"). The plural form of *footprint* depicts the progressive evolution towards the RIGHT DIRECTION, i.e. several TRACES have to be erased, which recalls the conceptualisation GREEN AS CLEAN discussed in Chapter 4, section 4.2. The scientist's ideological stance is aimed at convincing metaphor recipients to pursue emission reduction.

The FOOTPRINT can be attributed DIRTY features which are applied to the target domain POLLUTION. This conceptualisation gives rise to particular expectations about the need to CLEAN/REMOVE THE FOOTPRINT, as in:

> (23) NEW - But the big PR question, the one that must earn Miller (Stephen L. Miller, US politician) his remuneration, is how to rationalise this oxymoron "**clean coal**". How to square this carefully created image with inconvenient facts about the fuel's **huge carbon footprint** - greater than other fossil fuels such as oil and natural gas. *Guardian.com* February 26, 2009 **Greenwash**: Why '**clean coal**' is the ultimate climate change oxymoron (my addition in parenthesis)

The visible TRACE left by humans' PASSAGE (i.e., polluting human activities) is characterised by its unpleasant features. The TRACE is identified as DIRT, an exemplary model of human unpleasant trace over an area. The actions required to limit the impact of the FOOTPRINT appear uncomplicated in the CLEAN scenario-version.

The journalist criticises US environmental policies by denying the characterisation of the coal as *clean* ("oxymoron"). He/she quotes a far-right US politician, Stephen L. Miller, and questions the content of this quote through the POLLUTION AS A DIRTY FOOTPRINT scenario-version. The features involved in the interpretation of the scenario-version are highlighted to contradict the CLEAN quality of the gas advertised by the politician. The FOOTPRINT is characterised as "huge", which produces images of a "huge" amount of DIRT. This characterisation contradicts the CLEAN features attributed to the TRACE (i.e., no FOOTPRINT) by the politician. Additionally, the journalist establishes the FOOTPRINT as "inconvenient facts": he/she compares this CLEAN TRACE with dangerous gases, described as less damaging than the component of this TRACE ("greater than other fossil fuels"). The false characterisation of the FOOTPRINT as CLEAN is perceived by the journalist as *greenwashing* (in the title) which depicts a process by which the polluting characteristics of the gas are hidden to promote the gas as environmentally-friendly.

Metaphor users can focus on the result of human pollution, often from an international perspective, establishing a GLOBAL FOOTPRINT resulting from the addition of humans' TRACES. Metaphor users can also focus on the different occurrences of FOOTPRINT which are associated with every human, often from a national point of view, as in:

> (24) NEW - The most sophisticated such system, "contraction and convergence", was dreamed up by a former London busker, Aubrey Meyer, who runs the Global Commons Institute. Under it everyone on Earth would be entitled to **the same carbon footprint**. (…) Those who want to exceed **this permitted footprint**, such as by driving more or flying frequently, would have to buy permits from those who live more modestly. Experts think it would be the best way to bring down

> emissions fast and it should mean that the poor get wealthier by selling part of their allowances to the rich. Then we will be in the carbon age indeed. *The Independent on Sunday* November 12, 2006 **Carbon footprints**; News analysis: CLIMATE CHANGE; In the future we may each have our own personal emissions allowance. BYLINE: Geoffrey Lean

From the global perspective, the FOOTPRINT occurs as a result of the DIRTY or dangerous behaviour of humanity, depicted as a SINGLE BODY. The characterisation of HUMANITY AS A SINGLE BODY suggests that the MOVEMENT involved in the meaning of FOOTPRINT is pictured as A SINGLE MOVEMENT performed by the whole of humanity.

In (24), the GLOBAL FOOTPRINT scenario-version is exploited to deny the possibility that humans may leave different SIZES of FOOTPRINT. The journalist describes the TRACE through a global scope, but this scope is characterised in terms of SINGLE SIZE instead of a GLOBAL SINGLE TRACE. The identification of a PERMITTED FOOTPRINT suggests that humans have an authority over the SIZE feature of the FOOTPRINT. The SIZE feature is differentiated from the existence of the BODY at the origin of the FOOTPRINT.

This interpretation results from the journalist's reference to the "contraction and convergence" system which is illustrated through the use of the POLLUTION AS FOOTPRINT(S) scenario. The common emission allowance, valid for all humanity, is conceptualised as a SINGLE SIZE FOOTPRINT. This absurd metaphorical representation could have been used to criticise this system. However, such a criticism has not been identified in the remainder of the article which describes this system through its beneficial environmental consequences. The journalist establishes a gradation between the different FOOTPRINTS left (in the title) and the SINGLE SIZE FOOTPRINT allowed by this system.

In different occurrences, the FOOTPRINT belongs to a specific individual or country which leads to comparative views about the SIZES of each FOOTPRINT, as in:

> (25) NEW - Not only do they (19th and 20th century homes) cost a fortune to heat, **our "carbon footprint" looks like a clown's size-20 shoe**. As a rough guide, for every pounds 100 of gas bill, we release about a ton of carbon dioxide into the air each year. (…) Next year, **my carbon footprint will be not a giant clown's shoe but a dainty Cinderella slipper**. Honestly. *The Daily Telegraph* March 25, 2006

> Saturday The green gospel according to Dave With global warming an ever-increasing threat, we all have a duty to do our little bit. BYLINE: Sarah Lonsdale (my addition in parenthesis)

In (25), the journalist mocks Dave Hampton's depiction of human contribution to pollution. This strong criticism can first be observed in the article's headline which relies on a RELIGION metaphor, *gospel* (as it is defined in the OED), characterised by the adjective *green*. In Chapter 4, we have demonstrated that these metaphorical expressions can describe environmentalist beliefs as being grounded in fantasy.

Here, the journalist refers to Dave Hampton's website, "The Carbon Coach", and signals the use of particular expressions with inverted commas to refer to the topics discussed on this website. The journalist focuses on the human origin of polluting TRACES through an explicit association between FOOTPRINT and SHOE. She re-interprets Dave Hampton's advice through the different possible occurrences of the TRACE in terms of SHOE SIZE. This comparison presents a detailed picture of the range of possible SIZES. The CLOWN SHOE as opposed to the CINDERELLA SLIPPER are cited as exemplary models of very BIG and very SMALL SIZES. The desirability (according to Dave Hampton) of adopting a SMALLER SIZE is conceptualised in reference to the SHOE OWNER.

The referent of the source domain CLOWN SHOE is part of a costume aiming at making people laugh. The BIG SIZE OF THE SHOE is disproportionate to convey an amusing appearance to its OWNER. This disproportion can be related to the disproportional SIZE of the FOOTPRINT left by this SHOE. The journalist mocks what she perceives as an exaggeration by Dave Hampton regarding the over-reliance on polluting gas: the large FOOTPRINT left by gas users does not correspond to humans' actual SHOE SIZE.

She emphasises this exaggeration by opposing the CLOWN'S FOOTPRINT to CINDERELLA'S FOOTPRINT. CINDERELLA is identified, in popular culture, as a submissive, innocent princess. The link between the character and her SHOE SIZE suggests that her FOOTPRINT is not detrimental because it belongs to a benevolent fairy tale character. Additionally, Cinderella's shoe in the fairy tale is an essential element of the main plot: it is the element that helps benevolent characters to rescue her. Hence, the characterisation of an individual's emissions as the FOOTPRINT left by

CINDERELLA'S SHOE leads us to infer that this individual is an innocent emitter. The identification of her SHOE as a SLIPPER involves other characteristics related to the indoor use of the source domain referent, i.e. this specific SHOE is not expected to leave a huge FOOTPRINT compared to other kinds of SHOE used out-of-doors.

Such exaggerations regarding stereotypical HUGE and SMALL SHOE SIZES ridicule Dave Hampton's instructions. The reference to NON-HUMAN SHOE SIZES leads the metaphor recipients to infer that their FOOTPRINTS belong to the realm of burlesque performance and fairy-tale. This parodic comparison results in a strong criticism of Dave Hampton's stance ("honestly"): according to the journalist, he amplifies the extent of human pollution and overstates the effects of his directives about emission reduction for the purpose of self-promotion.

The SIZE feature of the FOOTPRINT can be distinguished from other features, through a wider range of comparisons, as in:

> (26) NEW – Canada and Australia - who also have **heavy carbon footprints** and a history of sceptical climate policies - are next furthest advanced in CCS (carbon capture and storage). Norway, which has put $1bn of state money into the world's largest CCS test centre at Mongstad and has been burying CO2 since 1996, is also a leader, but for different reasons. *Guardian.com* May 9, 2012 Wednesday Whatever happened to carbon capture in the fight against climate change? BYLINE: Damian Carrington (my addition in parenthesis)
>
> (27) ENV - The report shows that an insatiable appetite for meat, dairy, wood and other products that require large areas of land from Europe and the United States, makes their **'land footprint'** among the **highest** in the world. (…)The study uses the most recent data available, from 2004, but it can be assumed that Europe and the US's **hunger for land** is now even higher and rising due to the on-going increase in life-based energy sources such as biofuels and biomass. *Friends of the Earth*. Meat and forest products consumption fuel inequalities in global land use 10 October 2011

These characteristics are related to the particular BODY from which the FOOTPRINT originates. The FOOTPRINT can be directly equated to the BODY that has produced it.

In (26), the description of the WEIGHT OF THE FOOTPRINT relies on the metaphor recipients' knowledge of the different impacts of a LIGHT BODY and a HEAVY BODY: a HEAVY BODY would produce a FOOTPRINT that remains visible for a longer period than a FOOTPRINT produced by a LIGHT BODY. According to the

mapping of the source domain and the target domain POLLUTION, a LIGHT FOOTPRINT is desirable because its detrimental effect will disappear faster.

In this extract, the journalist questions the efficiency of the carbon capture system (see Chapter 5). He links the adoption of this system by Canada and Australia to the pollution rates and sceptical policies of these countries. Hence, the WEIGHT OF THE FOOTPRINT is expected to be LIGHTENED by CAPTURING the component of the FOOTPRINT.

In (27), *Friends of the Earth* quote their own report (the expression *land footprint* in inverted commas refers to the main topic of this report) and summarise the details of the findings through the use of the HIGH LAND FOOTPRINT scenario-version. The cultivation of lands is perceived as a LAND FOOTPRINT. The features of the FOOTPRINT damage the lands because of the relationship between cultivation, consumption, and environmental issues (established in the *Friends of the Earth*'s report). The environmentalists criticise Europe and the US about their food consumption, which results in a HIGH LAND FOOTPRINT. This criticism is metaphorically conveyed to the readership through the metaphorical expression "*hunger* for land". This expression draws a parallel between developed countries' consumption and developing countries' need for cultivation. *Friends of the Earth* link environmental damage to images of Europe and the US EATING THE LAND: their actions result in a HIGH LAND FOOTPRINT.

The conceptualisation of environmental damage as a HIGH LAND FOOTPRINT relies on the MORE IS UP conceptual metaphor (Lakoff & Johnson 2002: 15-6). It describes big damage as a HIGH FOOTPRINT and, consequently, smaller damage can be described as a LOW FOOTPRINT. This contradicts experiential knowledge of the FOOTPRINT concept because a LOW FOOTPRINT can be understood as being DEEPER and would therefore last longer than a HIGH FOOTPRINT. We can explain this conceptual relation by referring to the "Blending theory" or "Conceptual Integration Theory" (Fauconnier 2003; Fauconnier & Turner 2008). If we consider the increasing damage as an input space and the HEIGHT features mentioned in extract (27) as another input space, the blending leads to the conceptualisation of big damage as HIGH and small damage as LOW, producing the conceptual blending: MORE IS UP. Consequently, the

DEPTH feature of the FOOTPRINT is ignored to highlight the conceptualisation of increasing damage in terms of HEIGHT. This understanding fulfils persuasive functions because it relies on conceptual knowledge about the addition of concrete elements resulting in the increasing height of the elements grouped together. This conceptualisation produces the image of environmental damage, thereby materialised, "piling up" on the lands.

Koteyko (2010) discusses the phrase *low carbon footprint* in relation to the source domain DIET which promotes particular interpretation of the BIG QUANTITY OF CARBON AS BIG QUANTITY OF CALORIES. This gives rise to arguments presenting a lesser quantity of carbon/ calories as *healthier* (i.e., the addition of calories is compared with the addition of carbon; 2010: 665). We can infer that a LOWER LAND FOOTPRINT is similarly conceptualised as HEALTHIER ("*hunger* for land").

Another argumentative strategy to depict the dangerous effect of pollution relies on the characterisation of the FOOTPRINT as possessing HARMFUL features, as in:

> (28) ENV - When the Amazon is fumigated, large expanses of agricultural lands are also fumigated, leaving behind **a big toxic footprint** and rendering the soil infertile. (…) We affirmed our commitment to fight against the injustices caused by the greed emanating mainly from the North, which destroys ancestral values and cultures, which invades sacred places, which introduces machines which bore into the rock and **stain the earth** to extract metals, minerals, oil and pristine water. *Friends of the Earth*. Declaration of international conference of environmental and human rights, Cartagena 18 September 2003

In (28), the environmentalists focus on the existence of the FOOTPRINT as a TRACE that is not supposed to be found over particular areas. The features of the FOOTPRINT are distinguished from the features specific to the areas and their combination results in dangerous situations. *Friends of the Earth* describe the fumigation of the Amazon as an exemplary instance of the TRACE left by humans' PASSAGE. This description is followed by additional information about historical impacts of human activities on the environment. The POLLUTION AS A TOXIC FOOTPRINT scenario-version emphasises the harmful effect resulting from the production of this TRACE, qualifying it through extended features. The identification of the land as a BODY being POISONED ("rendering the soil infertile") characterises the FOOTPRINT as a TRACE that has a detrimental impact on the BODY HEALTH. *Friends of the Earth* emphasise the harmful

characteristic of the FOOTPRINT through the qualification of POLLUTION AS A STAIN which adds an unpleasant visual feature to the TRACE. This scenario-version amplifies the dangerous aspect of the FOOTPRINT. This extract conveys dramatic views which favour effective arguments about the need to control the production of the FOOTPRINT.

6.4. Summary

In this chapter, we have discussed particular storylines related to the materialisation of pollution. Despite the semantic gap between the source domains used in each narrative, we have shown that they all emphasise the detrimental aspects of pollution. Nerlich & Hellsten's (2014) results document this metaphorical interpretation when they discuss the common features of the *greenhouse effect* and *carbon footprint* metaphors in terms of risk assessment/ management, which allow metaphor users to quantify pollution. Consequently, the mapping makes emission reduction more concrete for the metaphor recipients (2014:28).

On the one hand, the TRANSFORMED HOUSE narrative has been discussed with reference to the EARTH AS A HOME metaphor (Romaine 1996: 181). The metaphor users refer to pollution as the DANGEROUS MATERIAL OF THE TRANSFORMED HOUSE. This interpretation focuses on human behaviour: humans are attributed an integral part in the CONSTRUCTION but also in the DESTRUCTION of the HOUSE. The scenario pictures humans ADDING MATERIAL which is subsequently expected to be REMOVED.

The TRANSFORMED HOUSE narrative can be extended to define a CLOSED CONTAINER. The CLOSED characteristic of the CONTAINER is attributed dangerous features related to the addition of heat metaphorically described as an ABSORPTION leading to SATURATION. This scenario is effective in picturing the danger of pollution as the DANGEROUS MATERIAL OF THE CONTAINER, and humanity and heat as a CONTENT. The CLOSED characteristic can establish the responsibility of humans who are pictured as LOCKING THEMSELVES UP INSIDE A DANGEROUS CONTAINER.

The EARTH AS A HEATED CONTAINER scenario involves more dramatic images used in our corpus to inform about the risk of inaction. We can compare the features of the metaphor recipients' experiential knowledge of heat with the features presented by the WARMING AS A BLANKET scenario. This scenario helps metaphor users to distinguish the different levels of heat (i.e., from a beneficial BLANKET to a GRILLING BLANKET).

On the other hand, the POLLUTION AS FOOTPRINT(S) scenario focuses on the visible features of the source domain to attribute them to the target. The materialisation of pollution is perceived through the occurrence of a DIRTY TRACE that needs to be CLEANED. This scenario can be related to the conceptualisation of the EARTH AS A SHARED HOME: this conceptualisation enables metaphor users to identify the CLEAN and the DIRTY INHABITANTS, attributing specific responsibility to particular countries. The FOOTPRINT scenario is less dramatic than the scenarios related to the TRANSFORMED HOUSE narrative because it relies on the idea of the EARTH AS A SHARED NATURAL HOME, which is not TRANSFORMED yet: the FOOTPRINT represents a DIRTY or dangerous TRACE left within the HOME (while the competing narrative about pollution involves a DANGEROUS TRANSFORMATION OF THE HOUSE).

The POLLUTION AS FOOTPRINT(S) scenario concretely quantifies the amount of pollution. This amount can be expressed in terms of a SINGLE BIG FOOTPRINT left by humanity when metaphor users promote common responsibility for climate change, or it can be expressed through the description of SEVERAL FOOTPRINTS. In such cases, the comparative ground differs depending on the features highlighted by metaphor users. They can focus on the SIZE of the FOOTPRINT or they can focus on the BODY at the origin of the FOOTPRINT with differences of WEIGHT and HEIGHT. Metaphor users can characterise the FOOTPRINT through the MORE IS UP conceptual blend (Fauconnier 2003; Fauconnier & Turner 2008) to describe continuous environmental damage.

In the next chapter, we discuss the perspective which illustrates doom predictions about the evolution of climate change. The associated narratives picture different ranges of INTERACTION between Nature, pollution, and humans which can lead to a CRASH, A RESPONSE, A WAR, or A CRIME.

Chapter 7: Perspective of doom prediction: Emphasis on the life-threatening aspect of irreversible climate change

7.1. Introduction

The narratives observed in our corpus can illustrate and emphasise the consequences of irreversible climate change. Irreversible climate change is described as a subsequent stage of the phenomenon which, once it is reached, would prevent any human control over environmental damages.

The scenarios discussed in this chapter rely on images of DEATH resulting from a range of events such as A TRANSPORT CRASHING/SINKING, A WAR, and A CRIME involving humans, pollution, and Nature. These metaphors provide effective arguments to convince metaphor recipients about the possibility of future life-threatening situations. The focus of this chapter can be contrasted with the scenarios observed in Chapter 4: while in Chapter 4, we have established that metaphors can emphasise the pleasant aspects of unaffected nature to argue for the recovery of these pleasant natural resources, in this chapter nature (affected by climate change) may be perceived as an ENEMY which endangers human life or as a VICTIM of human CRIME.

We identify two main narratives which focus on different images of irreversible climate change as a LETHAL EVENT. On the one hand, the CRASHING/SINKING TRANSPORT narrative pictures humanity as PASSENGERS OF A SHARED TRANSPORT who are doomed to die because this TRANSPORT IS DEFECTIVE. The metaphor users describe the need to FIX THE DAMAGE before the TRANSPORT CRASHES/ SINKS.

On the other hand, the FORCED INTERACTION, the WAR, and the CRIME scenarios give a more prominent role to humans within the CLIMATE CHANGE AS A CONFLICT narrative: polluting activities are perceived as a DECLARATION OF WAR to the planet, climate change is interpreted as nature or pollution being at WAR with

humanity, and particular weather events are identified as PROOFS OF A CRIME committed by humans or nature. Some metaphor users present a more detached view on the future through images of FORCED INTERACTIONS between nature and humans with the possibility of avoiding a more ANTAGONISTIC exchange. The JUSTICE scenario-version promotes the RESOLUTION OF THE CRIME by identifying the CULPRITS and preventing them from doing more damages.

7.2. The CRASHING TRANSPORT narrative

CRASHING TRANSPORT scenarios describe decisions about climate change and their consequences. These predicted consequences can be judged positively or negatively depending on authorial stances. The TRANSPORT can reach its DESTINATION, but this DESTINATION may be undesirable, according to the metaphor users. Other descriptions involve a JOURNEY which leads to a CRASH because the TRANSPORT IS DEFECTIVE (see extract 5 below).

CRASHING TRANSPORT scenarios in climate change discourse can be related to the JOURNEY metaphor which has been analysed in existing literature. Atanasova & Koteyko (2017b) report the frequent use of JOURNEY metaphors in *The New York Times* online editorials to advance pro-climate change arguments (e.g., conceptualisation of efforts and solutions to solve the issue). In their corpus composed of online press editorials from different countries, they find that the focus is on the JOURNEYING (e.g., the means put in place to reach a certain destination) rather than on the DESTINATION itself. Their findings supplement our analysis of CRASHING TRANSPORT scenarios highlighting an alternative view on the solutions proposed (e.g., counterarguments about environmental decisions). Asplund (2011) focuses on the PACE OF THE JOURNEY described in Swedish farm magazines discussing climate change. She highlights that efforts of adaptation are regularly conceptualised through motion verbs such as *break*, *crash*, and *creep,* and metaphorical expressions related to SPEED. These metaphorical expressions emphasise the need to SLOW climate change and convey a feeling of urgency to find solutions. In our analysis, the narrative (FUTURE) CLIMATE CHANGE AS A CRASHING TRANSPORT involves particular expectations about the SPEED which can be conceptualised as a dangerous characteristic of the JOURNEY. From a different

perspective, Deignan (2017) notes the frequent use of JOURNEY metaphors related to a particular TRAJECTORY in the descriptions of scientific diagrams illustrating different aspects of climate change.

The EARTH AS A SPACESHIP metaphor in environmental discourse is also documented in existing literature. Muir (1994) explains that this metaphor originates in Richard Buckminster Fuller's (theorist) book *Spaceship Earth* published in 1969. In this book, the Earth is conceptualised as an INTERSTELLAR VEHICLE CRUISING through the galaxy (1994: 148). Muir suggests that the SPACESHIP EARTH metaphor has been popularised to identify humanity as CREW ON THE SHIP (e.g., Disney Channel's use of the metaphor; 1994: 149). He writes that several metaphor users have relied on the SPACESHIP EARTH metaphor to comment on humans' lifestyle through depictions of humans' SURVIVAL TEST ON THE SHIP. According to this interpretation, humans are given the ability to CONTROL THE SHIP (1994: 149-50).

However, this metaphor was not observed in our corpus. This absence was also observed by Deese (2009). He shows that the use of the metaphor has been geographically and timely limited. According to his research, the SPACESHIP EARTH metaphor was part of American discourse about the environment from the 1960s and 1970s (2009: 70-1). The metaphor has emerged as a result of the Cold War and scientific improvements which provided a more concrete understanding of the Earth. Later, this conceptualisation gave rise to the MOTHER EARTH scenario (see Chapter 4) which has replaced the TRANSPORT metaphor in discourses about the environment (2009: 72-5). Therefore, the absence of the SPACESHIP EARTH metaphor in our corpus confirms Deese's claims.

The JOURNEY metaphor has been identified in a variety of discourses such as health communication (Nie et al. 2016; Semino et al. 2017), religious texts (Charteris Black 2004), or political speeches (Charteris Black 2004; 2019; Musolff 2004a; Semino 2008; Cibulskiene 2012; Dávid & Furkó 2015; Silaški & Durovic 2019).

In our corpus, the narrative (FUTURE) CLIMATE CHANGE AS A CRASHING TRANSPORT includes TRAIN, MARITIME and AIR TRAVEL scenarios. These scenarios are ordered in terms of SPEED and DESTINATION which characterise the different types of TRANSPORT. The BOAT scenario describes a SLOW JOURNEY: the metaphor users rely on this feature to illustrate the DAMAGES which are progressively

affecting the MOTION OF THE BOAT. The TRAIN scenario depicts a HIGH-SPEED JOURNEY and the source domain TRAIN suggests a relatively SHORT DISTANCE (compared to MARITIME and AIR TRAVEL). HIGHER SPEED is associated with higher probability of a CRASH, i.e. higher probability of irreversible climate change. The PLANE source domain comprises features related to a HIGH-SPEED JOURNEY and a DISTANT DESTINATION. With this scenario, metaphor users focus on two main characteristics of the PLANE: the PLANE is a FAST TRANSPORT and it allows PASSENGERS to reach DISTANT PLACES. Consequently, the DEFECTS OF THE PLANE are assumed to be unfixable while the PLANE IS IN MOTION.

We show that the CRASHING TRANSPORT narrative conveys specific features to climate change communication depending on the characteristics of the TRANSPORT and the DESTINATION.

7.2.1. The BOAT scenario

The BOAT scenario in climate change discourse presents specific features which differ from the features at play in other discourses. This scenario highlights the progressive aspect of environmental damages. Metaphor users focus on the time needed to FIX these DAMAGES before the BOAT SINKS. The source domain BOAT comprises features related to SLOW MOTION. This SLOW MOTION gives the PASSENGERS time to prevent DAMAGES. On the one hand, the BOAT can be described as progressively TAKING ON WATER (see extract 1), and on the other hand, a LIFEBOAT must be BUILT for humanity to survive climatic changes (see extract 2).

> (1) NEW - But at a conference on reporting climate change last week, senior Chinese scientists and negotiators were in an altogether less emollient mood. The official Chinese position is snappily summarised as "shared burden, differentiated responsibilities", **which roughly translates as: We're all in the same boat** but it's your fault that **it's taking on water**, so you'd better do most of the **baling**. *The Guardian* September 17, 2009 Thursday The world waits for Beijing: It could be the most crucial question we face today: just what is China's climate change strategy? BYLINE: Ian Katz

> (2) NEW - But with public confidence in climate science **taking such a knock** in recent months, what will it take to convince the public that urgent action really is required to reduce greenhouse gas emissions - or, as is Lovelock's preference, **to adapt and prepare the lifeboat** for a changing climate? (…) Lovelock freely admits that, at 90, he won't be around to see the results of the "experiment" humans are currently conducting with the atmosphere. It's what, in part, gives him the

> licence to speak with such frankness. But for anyone younger, Lovelock's prognosis for our species is hard to hear, let alone accept. That a black, rain-laden cloud is welling up over the nearby moorland as I set off to leave only acts to darken the mood. *The Guardian* March 30, 2010 Tuesday G2: 'Fudging data is a sin against science' BYLINE: Leo Hickman

In existing literature, the source domain BOAT has been observed in British political discourse and its frequent use has been justified with references to British maritime history (Charteris Black 2004: 162; 2019: 145; Silaški & Durovic 2019: 4). In our corpus, however, CRASHING TRANSPORT scenarios have exclusively been identified in newspapers (see Chapter 8) while other genres rely on different scenarios to illustrate doom predictions. The source domain BOAT can highlight the negative aspects of political decisions (e.g., to characterise the opposing party's JOURNEY; Charteris Black 2004: 163; 2019: 145-6; Cibulskiene 2012: 138; 149-50; Silaški & Durovic 2019: 4), through the identification of the SHIPWRECK scenario-version (Musolff 2004a: 55-6; 59). This interpretation can be compared to the metaphor users' view on environmental decisions.

The BOAT scenario in our corpus depicts a FAULTY BOAT which is SINKING. Consequently, PASSENGERS are expected to find solutions to SURVIVE. The depiction of the MARITIME TRAVEL reveals the extent of environmental damages. The EARTH AS A HOME narrative (Chapter 4) is adapted to define the EARTH AS A BOAT. The description of a SINKING BOAT focuses on the difficulty for humans to live in such a space. Extracts (1) and (2) discuss potential solutions to allow PASSENGERS TO SURVIVE: BALING or PREPARING THE LIFEBOAT.

In (1), the journalist re-interprets ("roughly translates") the Chinese opinion during a climate change conference. The picture of the EARTH AS A BOAT suggests that no PASSENGER can be OFF THE BOAT ("We're all in the same *boat*"). The conceptualisation of a SHARED CONTAINER presents climate change as a global threat. The characterisation of the BOAT as a SINKING BOAT fulfils argumentative functions in the Chinese scientists and negotiators' criticism of the bad behaviour of some of the PASSENGERS. The DANGEROUS JOURNEY is not attributed to climate change but to the PASSENGERS, which illustrates the anthropogenic cause of the phenomenon.

The MISBEHAVED PASSENGERS are expected to FIX THE BOAT/ to BALE to allow all PASSENGERS to stay ON BOARD.

This extract focuses on the responsibility of some countries for REPAIRING the environment. The journalist describes the Chinese position through the representation of INNOCENT PASSENGERS who have taken care of the BOAT while other countries, like the UK, are identified as the PASSENGERS responsible for the DAMAGES. This attribution of responsibilities is given by Chinese scientists and negotiators as a justification for asking other countries to find solutions to climate change.

The journalist uses this scenario to strongly criticise this stance. The scenario illustrates the Chinese unwillingness to take responsibility for climate actions. The picture of PASSENGERS ON BOARD OF A SINKING BOAT is effective in identifying the countries which are working to find solutions and the countries (China) which remain passive. The journalist's reinterpretation is emphasised through the explicit reformulation of the Chinese discourse (i.e., "The official Chinese position is snappily summarised as"; "which roughly translates as") and through ideological comments on this discourse (i.e., "Chinese scientists and negotiators were in an altogether less emollient mood"). The journalist aims at highlighting the inaccuracy of the Chinese position by opposing the collective consequences of climate change ("shared burden"; "same *boat*") and the partial responsibilities attributed by China to other countries ("differentiated responsibilities"; "it is your fault"). This opposition emphasises the contradiction in the Chinese statement which, consequently, appears as a selfish statement. This criticism also occurs in the headline: "The world waits for Beijing"/ "Just what is China's climate change strategy". The journalist uses the BOAT scenario to counter the Chinese position. This scenario can be compared with the narrative of the TRANSFORMED HOUSE in Chapter 6 (extract 6) which assigns the responsibility for CLEANING the environment to the DIRTY INHABITANTS of the Earth (as opposed to the CLEAN INHABITANTS).

In (2), the journalist distinguishes two alternatives to deal with climate change. He compares emission reduction with adaptation. He refers to the latter through the LIFEBOAT scenario-version which is attributed to James Lovelock (with reference to the Gaia theory; see Chapter 4). Lovelock's theory gives power to nature and describes climate change as the realisation of Nature's (or Gaia's) intended actions. Consequently, humans are attributed a passive role in mitigating climate change. Their role, according

to Lovelock, is to PREPARE A LIFEBOAT: we can infer that the Earth is conceptualised as a DEFECTIVE CONTAINER which cannot carry humans anymore. Hence, humans are expected to BUILD ANOTHER CONTAINER to survive.

The results provided by the BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "lifeboat" show that this word is often part of contexts describing various ranges of accidents, with collocations depicting life-endangering conditions like "ambulance", "hospitals", "flooding", "death", and "victim".

Here, the LIFEBOAT scenario-version identifies climate change as a MARITIME ACCIDENT which endangers the lives of the PASSENGERS. Compared to extract (1), the description in (2) is more dramatic because the PASSENGERS cannot remain in the present CONTAINER. Lovelock assumes that the DEFECTS of this CONTAINER are impossible to FIX.

This dramatic depiction is contrasted with the journalist's alternative solution: "reduce greenhouse gas emissions". The progressive evolution of climate change allows the PASSENGERS time to adopt this solution (i.e., the LIFEBOAT can still be avoided). The LIFEBOAT represents an alternative CONTAINER for humans whose characteristics, in comparison to the present CONTAINER (i.e., the Earth), comprise less desirable features, i.e. it is a TRANSPORT used for survival, as indicated in the BNC. Additionally, the DESTINATION OF THE LIFEBOAT adds undesirable features to Lovelock's solution: "the *lifeboat* for a changing climate". The purpose of the LIFEBOAT is described as an EMBARKATION in the DIRECTION of climatic changes. James Lovelock's stance, quoted by the journalist, reflects specific arguments about humans' choice not to reduce emissions.

The journalist endorses Lovelock's argument: the journalist's opposition to the LIFEBOAT scenario-version and his consent to reduce emissions appear as a self-evident choice. In the remainder of the extract, he establishes the validity of Lovelock's stance. Consequently, the lack of appropriate environmental decision appears absurd. The journalist contradicts arguments arising from a sceptical trend ("public confidence taking such a knock") through an emphasis on the danger of inaction, contrasted with the benefits of existing solutions.

7.2.2. The TRAIN scenario

The TRAIN scenario relies on a source domain whose features can convey different interpretations of the topic. Compared to the BOAT scenario, the TRAIN can TRAVEL FASTER, and its referent is more routinely used by the population.

In existing literature, the source domain TRAIN has been analysed as part of political speeches. Semino (2008: 92-5) notes that this source domain can illustrate the problems of the European monetary Union (e.g., each *carriage* corresponds to an EU country; the *engine* corresponds to the economy; and the *engineer* corresponds to the countries' governments). Cibulskiene (2012: 140) studies the EUROPEAN EXPRESS metaphor in Lithuanian political speeches about Europe. She finds that the metaphor is predominantly used by the Conservative Party to picture integration into the EU as a TRAIN TICKET. This conceptualisation helps the Party speakers to identify "good" and "bad" political *roads*, which can convince metaphor recipients about the desirability to REACH the EU (2012: 144). In a corpus of political debates about Europe, Musolff (2004a: 59) links the SPEED OF THE TRAIN JOURNEY to the SUCCESS OF THE JOURNEY (through SPEED comparison for different TRAVELLERS; 2004a: 41).

In our corpus, the relationship between SPEED and SUCCESS OF THE JOURNEY has been adapted to fit the particularity of the topic of climate change. The SPEED OF THE TRAIN JOURNEY is related to the INCREASING RISK OF CRASHING. The TRAIN concept is used for its features associated with FAST MOTION, and with the time required to SLOW IT. The necessity to SLOW THE TRAIN JOURNEY is derived from the DANGEROUS characteristics of the JOURNEY or the LETHAL characteristics of the DESTINATION (as opposed to the desirability of the DESTINATION discussed by Cibulskiene 2012). This is illustrated in the examples below:

> (3) NEW - The pollution we emit today will have effects for many years (partly because of the oceans). We cannot just stop emitting pollution and think this problem will immediately go away. We have to plan ahead. And, importantly, we have to stop emitting before most of the effects are evident. I like to think of the Earth's climate **like a heavy train**. **A train cannot stop quickly; the brakes have to be applied far ahead of an obstacle**. The ocean is our **"climate train."** *The Guardian* December 26, 2017 Tuesday US government climate report looks at how the oceans are buffering climate change BYLINE: John Abraham

> (4) NEW - "Coal-fired power plants are factories of death," wrote (Dr. James) Hansen, "the trains carrying coal to power plants are **death trains**". This deliberate echo of the **trains carrying Jews to Nazi death camps** recalled how the more extreme warmists like to equate sceptics on climate change with "**Holocaust deniers**". (…) Later in the week sceptics were struck by an admission from Professor William Schlesinger, a lead author for the IPCC. Since one of the enduring **myths** of our time is that the case for global warming is supported by "the world's top 2,500 climate scientists" on the IPCC, Schlesinger was asked in a public debate how many of its contributors are in fact climate experts. The best he could come up with was that "something on the order of 20 per cent have had some dealing with climate". (This will not of course stop the BBC calling any old evolutionary biologist or economist who supports its views a "leading climate scientist"). *The Sunday Telegraph* February 22, 2009 Climate change rhetoric spirals out of control BYLINE: Christopher Booker (my addition in parenthesis)

In (3), the journalist emphasises the HEAVINESS of the TRAIN to highlight the extent of the climate issue. He conceptualises THE AMPLITUDE OF CLIMATE CHANGE AS THE WEIGHT AND SPEED OF THE TRAIN which is grounded in metaphor recipients' knowledge of the (FAST) MOTION OF A HEAVY ENTITY which requires time to be STOPPED. This interpretation justifies the comparison with the phenomenon whose amplitude suggests limited time to find suitable solutions. The journalist emphasises the role of oceans in the regulation of climate change in the remainder of the article. He identifies oceans as a CLIMATE TRAIN and signals the metaphor with inverted commas. This shows that the identification is related to the metaphorical description in the preceding sentences of the extract: the identification of the oceans as a CLIMATE TRAIN comprises all the features highlighted in the preceding sentences and is only valid because of these features.

The presence of an OBSTACLE ON THE RAILWAYS (i.e., irreversible climate change) places a dramatic emphasis on the risk of a tragic ending (i.e., TRAINWRECK). This conceptualisation establishes strong arguments about the necessity for immediate actions, even though no PASSENGER is explicitly involved in this scenario. The journalist presents climate change as a rapidly evolving phenomenon: he relies on concrete concepts to illustrate this evolution through the TRAIN scenario. The characterisation of irreversible climate change as an OBSTACLE leading to a

TRAINWRECK is used to argue in favour of urgent actions that need to happen in the present: otherwise, the TRAINWRECK would be unavoidable.

In (4), the journalist cites the metaphor used by a scientist, Dr. James Hansen, to criticise his analogy. This extract presents three different points of view on the relation between coal and climate change.

First, the journalist refers to James Hansen's metaphor which characterises coal trains as *death trains*[11]. This TRAIN scenario-version equates human use and production of coal to the lethal consequences of pollution. The characterisation of the TRAINS as DEATH TRAINS identifies the coal industry as the entity responsible for the DEATHS related to climate change. This interpretation relies on the image of a DEADLY TRAIN JOURNEY. However, the cause of the DEATH is not metaphorically pictured as a TRAINWRECK or DEADLY DESTINATION. James Hansen simply highlights the deadly characteristics of the coal production, perceived through the scope of its transportation which triggers the use of the TRAIN scenario.

Second, the journalist re-interprets James Hansen's use of the TRAIN scenario to link the image of DEATH TRAINS to the HOLOCAUST ("trains carrying Jews to Nazi death camps"). Despite the journalist's opinion on James Hansen's "deliberate echo", we cannot perceive such a link between the DEATH TRAINS and the NAZI TRAINS in the initial quotation (nor in *The Guardian* article authored by the scientist). The journalist establishes this link to strongly criticise the scientific stance. He relies on irrelevant features of coal trains and NAZI TRAINS to ridicule the scientist's statement. The journalist emphasises his criticism through the identification of coal factories as DEATH CAMPS and climate change as the HOLOCAUST. This exaggerated view on coal production is attributed by the journalist to James Hansen. Consequently, the scientist's communication appears unsubstantial and irrational. By re-interpreting James Hansen's quote, the journalist pictures coal producers (and possibly coal users) as NAZIS: this involves a criticism which is missing from the original statement.

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[11] This scenario originates in a press article from *The Guardian*, authored by James Hansen (accessed 04/10/2019): https://www.theguardian.com/commentisfree/2009/feb/15/james-hansen-power-plants-coal

This scenario-version can be interpreted by reference to the "Blending Theory" (Fauconnier 2003; Fauconnier & Turner 2008): here, the generic space (i.e., the space in which the features of each domain are compared, see section 2.2.) involves two types of TRAIN which are both perceived through their negative characteristics. One of the input spaces includes the deadly destinations of Nazi trains and the other input space includes the deadly consequences of coal production (in relation to climate change) with a focus on the transport of coal. This leads to a blending which highlights a relationship between PROGRESS IN SPACE (in the case of Nazi trains) and PROGRESS IN TIME (in the case of coal trains) which present a lethal feature. This lethal feature is the aspect on which the journalist focuses to re-interpret the TRAIN scenario. This lethal feature is also explicitly referred to by James Hansen. However, the link established (exclusively) by the journalist between the lethal feature of coal and the lethal feature of the Holocaust transforms the focus on the deadly characteristics of coal industries and provides an absurd picture of the scientist's description of coal production.

The last point of view in this extract is attributed to the "extreme warmists". This viewpoint involves the role of deniers whose lack of belief in climate change is represented as a belief that the genocide did not happen ("*Holocaust* deniers"). This quote is often attributed to George Monbiot, a journalist and activist. In his blog, he attributes this quote to his colleague, James Randerson[12].

According to the journalist, "warmists" associate sceptical arguments about a well-documented genocide with sceptical arguments about the uncertain outcome of climate change. This comparison produces a strong criticism of deniers which is used by the journalist to ridicule the warmists' stance. He characterises "warmists" as EXTREMISTS and criticises the environmentalist rhetoric (headline: "Climate change rhetoric spirals out of control").

In the remainder of the article, the journalist's stance is very sceptical: he aims at disproving a list of scientific findings about climate change, which are presented as a

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[12] George Monbiot's quote in his blog:
https://www.theguardian.com/environment/georgemonbiot/2009/feb/27/climate-change-deniers-sceptics
James Randerson's quote in his blog:
https://www.theguardian.com/environment/blog/2009/feb/25/climate-change-denial-christopher-booker
(accessed 18/07/2019)

"myth" ("how many of its contributors are in fact climate experts"). All these aspects of the scenario uncover the journalist's highly sceptical view. He uses analogy with strong emotional impact (i.e., the Holocaust) to question climate change and relies on the non-matching features of the HOLOCAUST and CLIMATE CHANGE to ridicule James Hansen's and warmists' descriptions of the danger associated with the phenomenon.

7.2.3. The PLANE scenario

The PLANE scenario conveys specific features to the topic of climate change regarding the characteristics of this TRANSPORT (e.g., danger of a PLANE CRASH mapped to the danger of IRREVERSIBLE CLIMATE CHANGE).

This source domain has been analysed in existing literature about political discourse. Silaški & Durovic (2019: 7) identify the PLANE scenario in Brexit-related political cartoons which focus on the risk involved in this political decision. They note that the particularity of the source domain involves features associated with the force of gravity and knowledge about objects falling through the air. The resulting rapid and uncontrollable downward movement which can occur during a PLANE CRASH is used by cartoonists to picture political change as extreme or fatal (e.g., BREXIT AS JUMPING OFF THE AIRPLANE; 2019: 7). In political debates about Europe, Musolff (2004a: 58) notes that the PLANE scenario can be used to question the DESIRABILITY TO GET ON BOARD with references to a possible PLANE CRASH.

The focus established in the political uses of the PLANE scenario on the risk involved in the JOURNEY is prevalent in our corpus. The scenario helps the metaphor users to raise doubts about actions that need to take place (or not) with reference to the uncertainty regarding the effects of climate change, as in:

> (5) NEW - The often repeated question is: **would you get into a plane if someone told you there was a ten-to-one chance it would crash?** Of course you wouldn't. So why take that chance with the planet? *The Guardian* November 30, 2009 Monday Copenhagen 2009: Why Copenhagen matters BYLINE: Fred Pearce

> (6) NEW - Imagine you are about to **get on a plane** with your family. A huge group of qualified airline mechanics approach you on the tarmac and explain they've studied the engine for many years and they're sure it will **crash if you get**

> **on board**. They show you their previous predictions of **plane crashes**, which have overwhelmingly been proven right. Then a group of vets, journalists, and plumbers tell they have looked at the diagrams and it's perfectly obvious to them the plane is **safe** and that airplane mechanics - all of them, everywhere - are scamming you. **Would you get on the plane?** That is our choice at Copenhagen. *The Independent* December 4, 2009 Friday How I wish that the global warming deniers were right BYLINE: Johann Hari

These extracts are related to the characteristics of the PLANE as a means of TRANSPORT with which the readership may have less experience than with the TRAIN. This lack of familiarity can instigate fear about the BOARDING. Metaphor users instigate fear through descriptions of the DISTANT DESTINATIONS suggested by a JOURNEY ON A PLANE.

In (5), the focus is on THE EARTH AS A SHARED PLANE. The journalist describes scientific uncertainty related to climate change, from a general viewpoint ("the often repeated question"). He emphasises the potential risk for the planet which is identified as A PLANE WITH POTENTIAL FAULTS. He relies on the readers' fear of TRAVELLING IN A (POTENTIALLY) FAULTY PLANE to describe humans' impossibility of living on the Earth following the damages caused by climate change. The stance of the extract presses for actions to FIX THE FAULTS. The planet is perceived as a means of TRANSPORT which is not yet MOVING. The irreversible stage of climate change is identified as the MOTION OF THE TRANSPORT and the PLANE scenario emphasises that this MOTION cannot be stopped easily and involves a LONG JOURNEY. The journalist suggests that the absence of action would lead humanity to a DANGEROUS JOURNEY ON A FAULTY PLANE (that will eventually CRASH).

In (6), the journalist questions the identification of humanity as PASSENGERS OF THE PLANE. He represents CLIMATE CHANGE AS AN UNCERTAIN PLANE CRASH predicted by scientists ("airline mechanics") but contradicted by "a group of vets, journalists, and plumbers". This opposition produces an effective argument mocking the behaviour of climate sceptics who favour the advice of an unqualified part of the population rather than the advice of well-informed individuals. This subjective view is observable in the way in which the two groups are respectively described: "huge group of *qualified airline mechanics*", "have studied the *engine* for many years", "previous predictions", and in the emphasis on the biased opinion of the opposing participants: "a

group of vets, journalists, and plumbers", "have looked at the diagrams". The PLANE does not represent a SHARED TRANSPORT, it represents the effects of polluting activities which people pursue because they question the existence of climate change. The representation of the effects of these activities as a PLANE is justified through the features related to its DESTINATION ("get on board") which, in this case, will not be REACHED because the PLANE WILL CRASH, i.e. if people still pursue these activities, there will be severe climatic disasters. The journalist presents a picture which effectively argues in favour of scientific findings, and in favour of emission reduction by mocking sceptical beliefs.

In both extracts, the PLANE scenario aims at representing the significance of the Copenhagen summit, which involves political decision on global emission reduction.

7.3. The CLIMATE CHANGE AS A CONFLICT narrative: Evolution of the antagonistic relationship between humans, pollution, and Nature

7.3.1. The FORCED INTERACTION scenario*: emphasis on scientific prediction*

The human activities characterised by their progressive detrimental effects on nature are described in our corpus through scenarios corresponding to humans' expression of antipathy towards the environment. The metaphor users establish a relation of reciprocation according to which nature reacts to humans' behaviour. This reaction is defined according to scientific prediction. The effect of humans' activities is identified through the FORCING scenario used as an exemplary model of antagonistic intervention.

The results provided by the BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "forcing" show that this word is almost never used as a noun (only one occurrence was found in the BNC where the noun "forcing" is part of a labelling), compared with our corpus where the scenario relies on the nominal form. The expression *forcing* in our corpus has been specifically adapted to fit the topic of climate change because we can infer that the nominal use of the expression is specific to climate change discourse. In the BNC, the use of "forcing" as a verb includes this word within situations where an action or an element has a detrimental effect on the participants who

consequently have to alter their behaviour or project (e.g., in sentences like "However, the Japanese Energy Agency latter admitted that an emergency pressure release valve had failed to work during the shutdown process, *forcing* technicians to use a back-up water sprinkler system" token number: J2T-82618). The word is also used in situations where an action or movement is prevented and external elements or participants have to produce a range of actions to allow this action or movement to be realised (e.g., in sentences like "Shifting forward, she placed her hands down firmly on the sternum, *forcing* oxygen into his lungs" token number: JXW-1933120).

In climate change discourse, the FORCED INTERACTION scenario characterises human activities as altering the environment's normal evolution. This alteration is described through predictions about climate change. The resulting antagonistic relationship promotes the use of personifications enabling the metaphor users to raise awareness about a RESPONSE/FEEDBACK from the environment. The FORCED INTERACTION scenario relies on the characteristics established in the descriptions provided by the BNC (from *SketchEngine*, Kilgarriff 2003): these descriptions all reflect an alteration or a prevention of particular actions (e.g., Japanese technicians cannot work on the system they usually work on; the oxygen cannot reach the character's lungs). In all cases, "forcing" refers to the consequences imposed by an event that has disturbed the usual course of actions. In the context of climate change, this event can be identified as human pollution which has disturbed the evolution of climate. This causal relation is expressed through the FORCED INTERACTION scenario in our corpus. The RESPONSE/FEEDBACK represents the clues observed by humans (scientists) which demonstrate that the FORCING has disturbed the evolution of the climate, as in:

> (7) NEW - When the final version of the IPCC science report is released the qualifications will be there. One hundred per cent certainty cannot be provided for systems as complex as the earth's atmosphere, oceans, ice-caps and life, which all **interact** in shaping the planet's **response** to humanity's **massive intervention**. *The Independent* October 16, 1995, Monday The right climate for tax on fuel BYLINE: Nicholas Schoon

> (8) SCI - Even with no aerosol effect, it is several decades before any noticeable radiative **forcing response** to an emissions reduction policy occurs, simply because the carbon cycle has such a **long response time.** (…) Even a small aerosol effect, however, would **delay the response** of the climate system to future attempts to control or limit the greenhouse problem. *Nature* volume349, pages503–506 (07 February 1991) Could reducing fossil-fuel emissions

cause global warming? T. M. L. Wigley

In (7), the journalist refers to scientific findings which describe an INTERACTION which does not display particular emotional features (compared to descriptions of an ALTERCATION, see below). The "earth's atmosphere, oceans, ice-caps and life" are described as part of the same organism which is being disturbed by humans' INTERVENTION. This disturbance is expected to lead to a RESPONSE. The lack of characterisation of this RESPONSE can be a threatening interpretation of possible future events happening as a result of this FORCING. The lack of characterisation makes their occurrence more difficult to predict, which emphasises the risk involved in disturbing this organism. The journalist's argument focuses on the scientific impossibility of describing the RESPONSE with certainty ("One hundred percent certainty cannot be provided"). He justifies this uncertainty by emphasising the characteristics of the disturbed organism which may RESPOND in different ways. However, he qualifies humans' INTERVENTION as being "massive", which suggests that he does not question the occurrence of this RESPONSE. The journalist relies on the scenario to justify the scientific claims about climate change.

The perceptible alteration of nature is viewed as a RESPONSE or FEEDBACK from the environment. The two metaphorical expressions focus on the identification of specific natural events related to environmental disturbance. This relation emphasises the non-committal aspect of the RESPONSE because it identifies nature as an element that evolves and changes according to other neighbouring elements (e.g., humans).

In (8), the characterisation of the RESPONSE focuses on an INTERACTION that results in particular human expectations. The scientist distinguishes these expectations from the LONG RESPONSE TIME of the gas and nature. This LONG RESPONSE can mislead humans' belief that their activities were not "noticed" by Nature until its REACTION occurs. The focus is on the role of aerosols to potentially delay the greenhouse effect ("to control or limit the greenhouse problem") by blocking radiation and preventing rays from reaching the Earth. Aerosols are characterised by their role in the formation of clouds, which could block radiative rays[13]. The scientist argues that

[13] Stevens, B & Boucher, O. (2012). 'The aerosol effect'. *Nature* 490: 40-41, https://www.nature.com/articles/490040a

producing this "aerosol effect" or reducing emissions would not have the expected immediate consequences. He informs the readers that the INTERACTION between carbon and radiation takes time to produce particular consequences ("long response time"), even in the absence of the aerosol effect. The gas emissions, identified as a FORCING, would not result in an immediate REACTION from the carbon cycle.

This INTERACTION is contrasted with the aerosol effect. This effect would "delay" the occurrence of particular climatic REACTIONS resulting from the INTERACTION between gas, aerosol effect, and climate. The aerosol effect would also "delay" the RESPONSE of the climate to "future attempts" to control climate change. The scientist aims at contradicting expectations about the effects of human actions, he highlights that the effects of these actions will occur in a distant future.

Overall, the scenario establishes a FORCED INTERACTION in which the evolution of nature is influenced by humans. The metaphor users focus on humans' expectations about nature's RESPONSE. The function of this scenario is explanatory, i.e. it illustrates the consequence of human activities on nature/gas. The scenario pictures the INTERACTION between human activities and nature, perceived as a causal relation. Human actions are represented as imposing (or FORCING) a certain evolutionary course on nature. Consequently, nature presents signs that its evolution has been altered by displaying RESPONSE and FEEDBACK to humans.

7.3.2. The WAR scenario: Emphasis on the justification of climate change decisions

The CLIMATE CHANGE DECISIONS AS A WAR scenario focuses on a more dramatic view of the INTERACTION: it emphasises the damaging effects of climate change and pollution on humans and on nature. These damaging effects are perceived from a more emotional stance involving a WAR between humans, pollution, and nature.

The CLIMATE CHANGE DECISIONS AS A WAR scenario in our corpus is used to call for actions to protect the environment and to prevent a disastrous evolution of climate change. Associated occurrences identify nature or pollution as an ALLY or as an ENEMY.

Atanasova and Koteyko (2017a) link the use of WAR metaphors in climate change media discourse to the rise of scepticism. This increasing scepticism promotes the

metaphor users' need to share a feeling of emergency which calls for climate actions (2017a: 453-4). The linguists notice that WAR metaphors help to shift the metaphor recipients' attention by downplaying economic arguments and focusing on the emergency to find solutions (2017a: 459). Additionally, WAR metaphors can picture politicians on the same side as scientists, i.e. they are part of the same CAMP (2017a: 464-5). These findings have been confirmed by Flusberg, Matlock, and Thibodeau's (2017) survey whose results show that WAR metaphors were more effective in convincing participants to understand the risk associated with climate change than RACE metaphors (see Chapter 1, section 1.2.). Consequently, the participants were willing to operate change in their lifestyle (2017: 778-9). However, Nay and Brunson's (2013) survey about the impact of WAR and MEDICINE metaphors on the participants' beliefs about the management of forests shows contradictory results: they conclude that WAR metaphors do not influence support for any particular solution (i.e., tree burning or felling; 2013: 165).

Here, we demonstrate that such contradictory results can be explained by the different features involved in the CLIMATE CHANGE DECISIONS AS A WAR scenario. Depending on the decisions described and on the metaphor users' stance, this scenario can refer to polluting activities as an ATTACK on humans and Nature, but it can also present sceptical arguments, mocking the environmentalists' involvement in climate actions and exaggerating their claims about pollution. These arguments are illustrated in the examples provided below:

> (9) NEW- In Britain, 29,000 people die a year from breathing in particles of unburned carbon and construction dust, and an estimated 23,500 more as a result of nitrogen dioxide. To condone these deaths is unforgivable; to actively seek to carry on polluting **is like declaring war on the public**. *The Guardian* February 20, 2016 Saturday Climate change politics is blinding us to the devastating effects of dirty air BYLINE: John Vidal

> (10) ENV - In Cancún, small farmers and social movements aligned themselves with countries opposed to the unjust trade rules and agreements and protested against the WTO (World Trade Organisation) because this institution tries to guarantee rights for transnational corporations instead of environmental and human rights for people. (…) In the United States organizations have emerged to **fight for environmental justice** and against **ecological discrimination**, and so far as we know, they have yet to be called **terrorists**. Some of our organizations were created in Europe, Asia and Oceania to **fight** against the catastrophes caused by nuclear power plants and the mining of radioactive materials. Forest dwellers have united to oppose forest monocultures and tree plantations. We have also come together to **fight** the threats to rural communities and consumers all over the world due to the introduction of genetically modified

> organisms (GMOs) that destroy traditional agricultural practices and take away food sovereignty. Our organizations are not and never have been the fruit of **terrorist conspiracies**. *Friends of the Earth*. Declaration of international conference of environmental and human rights, Cartagena 18 September 2003
>
> (11) POL - Let me conclude – the **battle** the leaders of the G20 are **fighting** this week is not **the old one against old enemies**– but a new one, against global recession, **against climate chaos**, and against unemployment, insecurity poverty and hopelessness. "Global Rules, Global Values", London, Gordon Brown (Labour) 31/03/2009

These extracts demonstrate the extent to which metaphor users can depict CLIMATE CHANGE DECISIONS AS A WAR. In (9), polluters and non-environmentally-friendly political decisions are depicted as a common ENEMY for the rest of humanity ("on the public"). The journalist discusses the consequences of pollution on human health. This description associates the WAR on pollution with the WAR on humans, considering the lethal effect of pollution. The environment and humans (whose "health" is affected by pollution) are opposed to a portion of humanity who is DECLARING A WAR which endangers humans' survival ("29,000 people die a year from breathing in particles of unburned carbon"). The picture of affected humans suffering from a similar offensive ("polluting") is effective in identifying of a MUTUAL ENEMY: polluters and non-environmentally-friendly government. We can infer that the scenario depicts nature and affected humans as being part of the SAME CAMP. The journalist places polluters in the position of the humans responsible for the effect of climate change. The CLIMATE CHANGE DECISIONS AS A WAR scenario emphasises this responsibility since it carries images of DEATH which are associated with reported dramatic events ("29,000 people die a year"; "23,500 more") related to a series of deaths caused by pollution.

In (10), *Friends of the Earth* describe a range of environmental actions produced by the United States organisations to prevent the implementation of decisions taken by the World Trade Organisation (WTO). They claim that the WTO favours trade over environmental and human rights. The opposition of American environmental organisations to the WTO is depicted as a FIGHT. *Friends of the Earth* use the scenario to refer to a variety of environmental protests sparked off by the detrimental effects of particular events caused by trade-related decisions (e.g., "We have also come together to *fight* the threats to rural communities and consumers all over the world due to the

introduction of genetically modified organisms (GMOs) that destroy traditional agricultural practices and take away food sovereignty").

The disagreement following these protests is inferred from the response expected by *Friends of the Earth* from the WTO (and other organisations favouring trade). They foretell the traders' forthcoming argument and explicitly rely on this argument as a way to discredit them, even before they start criticising these environmental actions. *Friends of the Earth* justify the reason for the American organisations' protests: "In the United States organizations have emerged to *fight* for environmental *justice* and against ecological *discrimination*". Once such justifications have been established through particularly effective metaphorical expressions such as *fight*, *justice*, and *discrimination*, the environmentalists refer to the potential argument from the WTO using the TERRORISTS scenario-version. This scenario-version helps environmentalists to deride this latter argument and to highlight its contradiction by relying on related metaphors to depict the mischievous actions of the trading organisation ("ecological *discrimination*"), which are described as not respecting JUSTICE and promoting DISCRIMINATION.

In (11), the then British Prime Minister, Gordon Brown, focuses on the unprecedented characteristics of the risks involved in a wide range of issues which include climate change. He establishes a scale with different ranges of ENEMIES, which enables him to compare "old" issues with "new" ones. He emphasises the comparison to convey a feeling of emergency. These "old" and "new" issues (which include climate change) are described through the BATTLE scenario-version to cover the various issues that his government aims at tackling. Compared with the FORCED INTERACTION scenario which has been adapted to fit the topic of climate change (i.e., nominal form of *forcing*), this extract shows that the WAR scenario in the politician's speech is not limited to environmental issues. Instead, the scenario identifies the wider range of problems the government is about to tackle. Gordon Brown's distinction between "old" and "new" issues, which are altogether identified as ENEMIES, emphasises the conventional conceptualisation of political concerns as BATTLES. This conventional use of the scenario provides further insight into the politician's view on climate change because the identification of environmental concerns as a BATTLE places the phenomenon on the same scale as other concerns such as unemployment, insecurity, and poverty, pictured as several ENEMIES. This general conceptualisation prevents any particular emphasis on

the significance of each problem and presents all issues as sharing similar characteristics (i.e., affecting the population in a similar way). By excluding the characteristics of each problem that the government aims at tackling, Gordon Brown consequently downplays the particular impact of climate change.

The CLIMATE CHANGE DECISIONS AS A WAR scenario in our corpus focuses on environmental decisions leading to disagreements on the enactment of particular climate actions. It describes the consequences of actions which may lead to a division of communities, countries or, to a larger extent, humans. We have shown that the WAR scenario does not only convey a feeling of emergency to solve the issue but also presents a negative perspective on environmental actions or discourse.

7.3.3. The CRIME-JUSTICE scenario: Emphasis on scientific prediction and environmental solution

The CLIMATE CHANGE AS A CRIME scenario adds particular characteristics to the description of human influence on the evolution of the environment. On the one hand, it identifies CRIMINALS who can be characterised by their lack of concern about emission reduction (human CRIMINALS). Dangerous weather events can also be personified as CRIMINALS (nature as a CRIMINAL). Consequently, the scenario identifies different VICTIMS, depending on the authorial stance (humans or Nature). The VICTIMISED nature recalls the DAMAGED BODY narrative discussed in Chapter 5. The BODY is pictured as suffering from a CRIMINAL ATTACK by humans as a result of the damages of pollution.

The CLIMATE CHANGE AS A CRIME scenario suggests that humanity is not always perceived as a single entity but is divided between CRIMINALS, VICTIMS, and WITNESSES OF THE CRIME. These different roles have an argumentative function in view of pollution rates and consequences on humanity and nature. The occurrence of the CRIME can be uncertain (i.e., scientific uncertainty). In some cases, metaphor users assert that the CRIME has already been COMMITTED and that its effects are still producing damage.

The PROOF OF CLIMATE CHANGE AS A FINGERPRINT scenario-version describes the INVESTIGATION PROCEDURE, taking into account the uncertainty

concerning climatic evolution. The CLUES described in the extracts presented below are perceived in relation to scientific prediction about the evolution of climate change.

> (12) NEW - The unmistakeable **fingerprint** of extreme weather event[s] at the **crime scene** of global warming seems intuitively obvious: consider that Houston is reckoned to have been hit by three "500-year floods" in three years. *The Guardian* September 10, 2017 Sunday The Guardian view on climate change: see you in court (my addition in parenthesis)
>
> (13) ENV - A study of the European heat wave in the summer of 2003 (…) concluded that there was a clear global warming **fingerprint on the killer heat wave**, and that by mid-century, such a summer would be cooler than average. *Friends of the Earth*. Climate change: governments talk but don't act 13 May, 2005
>
> (14) SCI - The study of Santer et al., and those reported in the IPCC Second Assessment, show that an anthropogenic component of global climate change – the '**anthropogenic fingerprint**' may be appearing in the observed data. *Nature* volume382, pages27–28 (04 July 1996) An **incriminating fingerprint** Neville Nicholls

The PROOF OF CLIMATE CHANGE AS A FINGERPRINT scenario-version ascribes particular features to the topic. Its source domain represents the exemplary CLUE by which INVESTIGATORS can identify a CRIMINAL. This CLUE enables scientists to confirm or contradict climate predictions. The focus is on the uncertainty associated with climate change.

The results provided by the BNC (from *SketchEngine*, Kilgarriff 2003) for the search term "fingerprint" show an explicit link between the word and collocates from the semantic field of "crime" (e.g., "British spy Ian Spiro left bloody *fingerprints* smeared on his son's bedroom walls after blasting him in the head twice with a handgun" token number: CEM-83430411). "Fingerprint" qualifies a clue left by a human body part. Unlike "footprint" (see Chapter 6), this particular body part enables observers to identify the individual to whom the clue belongs. In the BNC, the descriptions of "fingerprint" depict the function of the referents: it can help to identify an individual (e.g., "the case had been brought to the attention of the legal authorities when the family contacted the police to ask if a DNA *genetic fingerprint* could be obtained from the aborted foetus to provide legal evidence on the identity of the alleged rapist" token number: HLG-13999465).

In our corpus, we notice that the identifying function of the referent is relevant to interpret the scenario. In (12) and (13), the weather is attributed human characteristics

which are related to human CRIMINALITY. In both cases, climate change and weather events are pictured according to their involvement in the CRIME: in (12), "global warming" is identified as the CRIME SCENE while "weather events" are the CRIMINALS, and in (13), "global warming" is the ACCOMPLICE of a particular weather event.

In (12), the journalist focuses on the identification of specific weather events as part of the effects of climate change. He/she aims at proving the existence of the destructive effect of climate change by including "extreme weather events" within the CRIME scenario. The CRIME scenario emphasises the danger of climate change: related events are conceptualised as CRIMINALS involved in the CRIME SCENE.

In (13), *Friends of the Earth* report on scientific findings: they discuss these findings through the CRIME scenario which reiterates the content of the scientific report (i.e., the scientists are able to observe a FINGERPRINT). They refer to the findings through the KILLER scenario-version which emphasises the dramatic aspect of such findings. The FINGERPRINT belongs to climate change and the CRIMINAL is explicitly identified as being the "*killer* heat wave". The possibility of OBSERVING THE FINGERPRINT enables the metaphor users to portray climate change as an ACCOMPLICE. Here, climatic events are identified as one of the CRIMINALS. *Friends of the Earth* rely on these scientific findings to highlight the danger of climate change. The resulting picture is threatening because climate change is perceived as a CRIMINAL whose presence is acknowledged by scientists (i.e., specific visible features of the source domain FINGERPRINT) committing CRIMES with a KILLER. *Friends of the Earth* describe the INVESTIGATION to establish and exemplify the dangerous effect of climate change, which induces fear into the metaphor recipients. This threatening version may be effectively used to convince metaphor recipients about the lethal effects of climate change.

In (14), the FINGERPRINT scenario reveals the human influence on climate change, identified as a CRIME. The explicit establishment of the human origin of the FINGERPRINT may seem redundant, especially within the CRIME scenario. The scientist focuses on the particularity of observing such a clue on an element which humans are not expected to access (i.e., climate). The description of this clue transgresses the features of the target domain which defines an immaterial entity. The scientist emphasises

the human origin of the FINGERPRINT to justify findings about the anthropogenic cause of climate change: these findings are documented by the observation of a clue. The human alteration of climate is perceived as a CRIME ("an incriminating fingerprint"), which reveals a strong criticism on the part of the scientist. He focuses on the human origin of the FINGERPRINT to blame human activities, identified as a human CRIME on the climate (in the title of the article). The particularity of the scientist' knowledge places him in the position of the OBSERVER OF THE FINGERPRINT (i.e., the source domain referent requires particular knowledge and tools to be observed). This ability to OBSERVE THE FINGERPRINT enables the scientist to report the identity of the CRIMINAL: he has the responsibility to draw a link between humanity and the CRIME. This interpretation can be related to the WAR scenario in (9): pollution is here attributed CRIMINAL features which emphasise the harmful effects of polluting activities on nature.

We notice that none of the occurrences of the FINGERPRINT scenario-version establishes the identity of the VICTIM (except in 13: the VICTIMS can be indirectly identified as the people killed by the heat wave). The lack of identification of the VICTIM shows that metaphor users focus on the nature of the CRIME that has been committed and on the identity of the CRIMINALS.

This focus establishes a common goal to control climate change that is, convincing the metaphor recipients to STOP THE CRIMINAL or STOP THEIR CRIMINAL ACTIVITIES. Some scenario-versions focus on the identity of the CULPRIT and contrast the damaging features of polluting entities to perform this identification. This is illustrated in the example below:

> (15) ENV - The UN climate talks in Durban have reminded the world that **agriculture is responsible** for almost one fourth of the world's emissions of greenhouse gases. However, they are failing to expose industrial agriculture as the **culprit** and small-scale agroecological food production **as the only solution to the problem**, said Friends of the Earth International today. *Friends of the Earth*. Climate talks: sustainable, small-scale, and peasant agriculture needed to cool down the earth 05 December 2011

In (15), the CULPRIT scenario-version establishes distorted beliefs about responsibility for climate change. According to the environmentalists, decision makers involved in Durban talks express misleading reasoning about the identity of the

CULPRIT. Their general identification of the entity responsible for pollution ("agriculture") is contradicted by *Friends of the Earth*. They distinguish the "industrial agriculture" from the "small-scale agroecological food production". This distinction helps them to emphasise the negative features of the former and the positive features of the latter. The identification of "industrial agriculture" as a CULPRIT produces an emphasis on the consequence of the industrial activities whose pollution is described as A CRIME. The environmentalists deny the identification of the whole sector as forming a single entity responsible for the damages. *Friends of the Earth* highlight the particularities of each type of agriculture which enable them to identify the REAL CULPRIT (industrial agriculture) as opposed to the WRONG CULPRIT (small-scale agroecological food production). They describe the WRONG CULPRIT through a focus on its beneficial effect: "the only solution to the problem". The identification of the REAL CULPRIT involves an argument in favour of particular regulations to control the CULPRIT (industrial agriculture).

The CRIME scenario promotes the call for JUSTICE which aims at asserting responsibility for the CRIME, as in:

> (16) NEW - Consider the words of James Lovelock's **Revenge of Gaia**, published this year. 'The bell has started tolling to mark our ending. Only a handful of the teeming billions now alive will survive.' And in The Last Generation Fred Pearce revealed a similar sense of biblical misery in his subtitle: 'How Nature will take **revenge** for Manmade Climate Change'. Lovelock and Pearce's Calvinistic glee is understandable, of course. (…) On the other hand, such a response has only a limited publishing appeal and we need, very rapidly, to move on to a form of climate writing that is a little more prescriptive, a point clearly understood by George Monbiot. He describes his book, Heat, not as a warning to the world, but as 'a manifesto for action and a thought experiment'. As he states: 'We have a short period - a very short period - in which to prevent the planet from shaking us off.' *The Observer* November 12, 2006 Review: Books: ENVIRONMENT: Who will save the Earth? BYLINE: Robin McKie
>
> (17) ENV - But climate negotiations show no progress and communities are calling for urgent action to address climate change and to protect their livelihoods in a manner that is consistent with human rights, worker's rights, and **environmental justice**. *Friends of the Earth*. Urgent action needed to address climate change, says rally 28 October 2002
>
> (18) POL - Madam President, there is nothing new or unusual about the Tory commitment to protect the environment. The last thing we want is to **leave environmental debts** for our children to clear up - slag, grime, acid rain and pollution. Leader's speech, Brighton Margaret Thatcher (Conservative) 14/10/1988

The CLIMATE CHANGE SOLUTION AS JUSTICE scenario-version illustrated in these extracts provides additional information about the CRIMES previously discussed. It focuses the potential responses to these CRIMES and highlights the need to improve the resulting situations. The JUDGEMENT involved in the interpretation of the scenario-version is expected to be undisputed and imposed on society because of its legal characteristics.

In (16), the depiction of the REVENGE involves humans' ATTACK over nature as a LIVING ENTITY (Gaia/ *Mother Nature*; see chapter 4). The JUSTICE occurs according to a typically human reaction, REVENGE, which results in the personification of Nature. The journalist Robin McKie distinguishes three main uses of the REVENGE scenario-version in this extract – James Lovelock's, Fred Pearce's, and George Monbiot's – to establish the most convincing use of this scenario-version.

Robin McKie first refers to the link between the Goddess Gaia and James Lovelock's theory, which depicts climatic disruption as a REVENGE performed by Gaia.

Robin McKie then describes how this link is exploited by the journalist and activist Fred Pearce who attributes the REVENGING behaviour to Nature. This personification induces fear into the metaphor recipients because of the divine features invoked. To this extent, Pearce's book echoes Lovelock's theory. Lovelock conceptualises CLIMATE CHANGE AS GAIA'S REVENGE, however, Pearce interprets the phenomenon as NATURE'S REVENGE. Pearce's interpretation adds a threatening characteristic to the topic because the REVENGE is not associated with a myth but with an element that is part of humans' reality. Additionally, Pearce identifies "Manmade Climate Change" as the cause of the REVENGE. The emphasis on the human origin of the phenomenon identifies humanity as the entity who will suffer from this REVENGE.

In both publications ("Revenge of Gaia" and "The Last Generation"), the characterisation of JUSTICE as a PERSONAL JUSTICE emphasises the threat because of the related absence of control and absence of social and official structures helping to frame it. Hence, this REVENGE is threatening because its manifestation cannot be predicted.

In the remainder of the extract, Robin McKie contests this threatening view on the phenomenon: he claims that these pictures of irreversible climate change do not trigger enough attention ("limited publishing appeal") and he promotes a different view on the topic endorsed by George Monbiot's book, "Heat".

In (17), *Friends of the Earth* use the JUSTICE scenario-version to insist on the role of the government and nations. The scenario-version highlights the legal features of the source domain. The experience of global warming and its damaging effects have triggered the call from particular communities to make climate negotiators act to warrant ENVIRONMENTAL JUSTICE. We can infer that this extract depicts the ROBBERY of "healthy" living conditions in the affected communities ("communities are calling for urgent action"). The JUSTICE scenario-version emphasises the extent of the effect of polluting activities, depicted as a JUDICIAL ISSUE.

In (18), the DEBT scenario-version pictures the disappearance of natural resources as MONEY that has been BORROWED by the current generation from the generation which does not exist yet. The former UK Prime Minister conceptualises the future unavailability of natural resources as keeping MONEY from the future population. We can compare this scenario-version with the scenario HUMANITY/NATURE AS A FAMILY discussed in Chapter 4. However, in (18), Margaret Thatcher does not argue for the need for environmental protection in terms of emotional and familial values but in terms of FINANCIAL DUTY. These financial aspects define this protection as a LEGAL DUTY rather than a PERSONAL DUTY. Additionally, the political origin of the scenario-version emphasises the LEGAL characteristic of this DUTY, i.e. politicians can enact particular decisions. This is a way for the politician to justify environmental decisions. In the remainder of her speech, she praises the existence of *green* policies implemented by a Conservative government. For example, she mentions the Clean Air Act which was voted in 1956 by her Party. Hence, the CLIMATE CHANGE SOLUTIONS AS A DEBT scenario-version comprises arguments to promote the environmental concerns from the perspective of this particular Party.

7.4. Summary

In this chapter, we have identified the narratives that emphasise the role of humans in causing and/or solving climate change. These narratives illustrate a variety of doom predictions about climate change resulting from different decisions or observations.

On the one hand, the CRASHING TRANSPORT narrative focuses on the outcome (DESTINATION/MOTION) of environmental decisions. We have shown that different means of TRANSPORT convey specific features to the topic of climate change. The relation between the source domains and climate change discourse gives rise to specific interpretations. These interpretations can differ from the metaphorical interpretation in other discourses relying on the same source domains (Charteris Black 2004: 163; Musolff 2004a: 55-6; 59; Cibulskiene 2012: 138; 149-50; Silaški & Durovic 2019: 4). Scenarios such as (FUTURE) CLIMATE CHANGE AS A SINKING BOAT, TRAINWRECK, and PLANE CRASH are of particular interest. They emphasise the danger of (potentially) irreversible climate change. For instance, the BOAT scenario relies on the conceptualisation of a CONTAINER SHARED by humans. Climate change is pictured as a DEFECT which is making the BOAT SINK. The metaphor users focus on the solutions proposed for the survival of humanity. This can involve the identification of the responsible PASSENGERS or the construction of a LIFEBOAT. A significant aspect of the interpretation of the TRAIN scenario is the description of the SPEED OF THE TRAIN JOURNEY. In political debates, the SPEED OF THE TRAIN and its DESTINATION are associated with SUCCESS (Musolff 2004a: 59; Cibulskiene 2012: 140) while in our corpus, the SPEED OF THE TRAIN is presented as a risk involved in THE TRAIN JOURNEY (e.g., climate change as an OBSTACLE) which can lead to a TRAINWRECK. The PLANE scenario focuses on humans' decisions to GET ON BOARD, i.e. to reduce emissions. The (FUTURE) CLIMATE CHANGE AS A CRASHING TRANSPORT narrative illustrates the outcome of climate decisions, whose enactment influences the characteristics of the MOTION/DESTINATION.

The prediction about the evolution of climate change gives rise to a narrative picturing CLIMATE CHANGE AS A CONFLICT between humans, polluters, government, and Nature. This CONFLICT can be described as a FORCED

INTERACTION or, in more dramatic forms, as a WAR or CRIME involving humans, polluters, government, and Nature. The descriptions of various disagreements about climate change (e.g., political, (inter)national, sceptics and environmentalists' disagreements) by means of the WAR scenario emphatically picture the emergency of the issue and the need to solve the problem. Our discussion has shown that the metaphor users rely on the CLIMATE CHANGE DECISIONS AS A WAR scenario to define particular CAMPS, with different ENEMIES or ALLIES.

The CLIMATE CHANGE AS A CRIME scenario has not been previously discussed in the literature. In our corpus, the scenario describes scientific findings about climate change. While the CLIMATE CHANGE DECISIONS AS A WAR scenario involves climate-related decisions, the CLIMATE CHANGE AS A CRIME scenario involves scientific findings and provides justification to confirm or contradict predictions. The scenario shifts the metaphor recipients' attention to focus on the INVESTIGATION, instead of focusing on the CRIME itself. The description of this INVESTIGATION is relevant because it establishes the role of scientists and informs about existing uncertainty. The observation of the FINGERPRINT results in the identification of the CRIMINAL which leads to the CLIMATE CHANGE SOLUTION AS JUSTICE scenario-version. This scenario-version either involves Nature's PERSONAL JUSTICE or takes place in a more legalistic setting to establish a DEBT to be paid.

Our discussion of the CLIMATE CHANGE AS A CRIME scenario provides a new insight into the argumentative function of narratives in climate change discourse. The CRIME-JUSTICE scenario is effective in establishing responsibility for climate change. It focuses on the origin and effect of the problem and on the actions that need to take place to find a favourable resolution.

In the next chapter, we relate the use of the scenarios discussed in Chapters 4, 5, 6, and 7 to the particularities of each genre (RQ2), and we illustrate the evolution of each narrative to identify a possible link between the use of scenarios and narratives in the four genres and particular events related to climate change (RQ3).

Chapter 8: Distribution and chronological patterns of climate change narratives and scenarios in the four genres

8.1. Introduction

We now investigate the use of each scenario discussed in the preceding chapters (Chapters 4, 5, 6, and 7) in terms of their respective distribution in each genre. The distribution patterns are expected to provide answers to our second research question as to whether and to what extent the use of climate change scenarios can be contrasted in the four genres. By observing specific use of scenarios in each genre, it is possible to demonstrate a how climate change is described through the scenarios in newspapers, scientific papers, environmentalist publications, and political speeches. We focus on the particular uses of the scenarios to identify a dominant interpretation in each genre.

In this chapter, our analysis focuses on the smaller version of our corpus which comprises articles and speeches produced between 2001 and 2017 (see Chapter 3, section 3.7.). We study the frequency of use of narratives and scenarios in this smaller version of our corpus, identifying the percentages representing the frequency of a specific scenario/narrative within a particular genre.

We also investigate the chronological evolution of narratives in our corpus. Tracing the evolution of particular narratives can establish key periods during which climatic events have promoted a more frequent use of scenarios.

We first focus on the specific features of the scenarios used in newspapers. We then investigate the use of scenarios in the scientific, environmentalist, and political discourses. We study the chronological distribution of the narratives in each genre. These frequencies draw links between the scenarios observed in our corpus and climatic events.

8.2. Distribution of scenarios in NEW

To establish the particularities of the metaphorical descriptions of climate change in newspapers, we investigate the distribution of the scenarios and narratives previously discussed and their interpretations. This distribution shows the most salient scenarios in British newspapers to describe climate change. This identification emphasises the particular ways in which journalists metaphorically perceive climate change according to the specific requirements associated with the newspaper readership.

The number of NEW articles published between 2001 and 2017 amount to 18, 656 articles. The average number of words per NEW article is established at 714.051 words (total number of words: 13, 321, 344). The total number of scenarios in NEW is 2,671. Table 6 presents the number of NEW articles per year, the average number of words per article, and the number of scenarios per year. Table 7 presents the general distribution of NEW scenarios pertaining to the different perspectives discussed in the preceding chapters. The percentages displayed in Table 7 represent the frequency of the scenarios associated with each perspective in NEW out of the total number of scenarios in NEW.

Table 6: Number of articles/ scenarios and average number of words per year in NEW

Year	**Number of articles**	**Average number of words per article**	**Scenarios (occurrences)**
2001	199	521.27	32
2002	127	617.73	15
2003	157	577.77	31
2004	274	596.82	68
2005	647	576.23	107
2006	974	528.16	181
2007	1,235	612.6	303
2008	777	582.53	140
2009	1,334	635.1	272
2010	880	593.7	107
2011	751	651.06	119
2012	917	613.9	156
2013	1,452	631.14	154
2014	1,851	697.7	205
2015	2,562	780.1	326
2016	2,462	805.58	235
2017	2,057	715.11	220

Table 7: Distribution of scenarios across perspectives in NEW

Perspectives	Percentages	Occurrences
Eulogy	9.85%	263
Deterioration	***35.75%***	***955***
Materialisation	***41.37%***	***1,105***
Doom Prediction	13.03%	348
Total	100%	2,671

Table 7 shows that NEW articles mainly depict climate change in terms of a deterioration of nature (35.75%) and a materialisation of pollution (41.37%). By comparison, journalists seldom rely on the other perspectives, i.e. those associated with the eulogistic view on (unaffected) nature (9.85%) and the doom prediction about the evolution of climate change (13.03%). In the following section, we discuss the use of NEW scenarios in more details.

8.2.1. The salient scenarios in NEW: deterioration of nature and materialisation of pollution

Table 7 shows that the journalists frequently discuss climate change in terms of a deterioration of nature and a materialisation of pollution. We focus on these two perspectives to establish the journalistic metaphorical stance on the topic.

8.2.1.1. The scenarios of deterioration of nature

As observed in Chapter 5, the scenarios that picture climate change as a deterioration of nature can be related to the DAMAGED BODY narrative: the ORGANS and HEALTH CONDITIONS are attributed to a non-human entity. The *ozone hole* metaphor can be related to the DAMAGED BODY narrative with metaphorical collocates such as *heal* or *cure*. The metaphorical expression can also be part of the DAMAGED CONTAINER narrative: the *ozone hole* metaphor refers to a DAMAGED PART OF THE CONTAINER. The interpretation of the metaphorical expressions *escape*, *release*, *runaway,* and *fugitive* is related to the detrimental aspect of climate change, it describes a MOVEMENT OUTSIDE THE CONTAINER resulting in a LOSS OF THE CONTENT that is detrimental for humans. The CAPTURE/SEQUESTRATION scenario describes human actions aiming at preventing the LOSS ("carbon *capture*").

We have distinguished the scenarios used as part of the DAMAGED BODY narrative from the scenarios used as part of the DAMAGED CONTAINER narrative in NEW. Table 8 illustrates this distribution.

Table 8: Distribution of deterioration scenarios in NEW

Scenarios	Percentages	Occurrences
DAMAGED BODY	6.28%	60
DAMAGED CONTAINER	***93.72%***	***895***
Total	100%	955

Table 8 shows a prevalence of scenarios picturing the effects of climate change as leading to the existence of a DAMAGED CONTAINER (93.72%). The DAMAGED CONTAINER scenarios include the descriptions of various processes, which metaphorically establish a LOSS of CONTENT but also solutions provided to limit this LOSS, i.e. CAPTURE/SEQUESTRATION scenario. Comparatively, the DAMAGED BODY scenarios involve particular VITAL ORGANS and a variety of MEDICAL EQUIPMENTS applied to natural resources. Therefore, while the DAMAGED CONTAINER narrative focuses on the global effect of climate change (see section 5.3), the DAMAGED BODY narrative focuses on particular resources and their VITAL functions for the unproblematic evolution of nature/humanity (see section 5.2). These different narratives and their distribution in NEW show that journalists focus on the general detrimental effect of climate change instead of the effect on particular resources.

At a closer inspection of these scenarios in NEW, we note that journalists refer to a DAMAGED CONTAINER more frequently in terms of a LOSS than in terms of the limitation of this LOSS (CAPTURE/SEQUESTRATION).

Table 9: Distribution of DAMAGED CONTAINER scenarios in NEW

Scenarios	Percentages	Occurrences
LOSS	***60.11%***	***538***
CAPTURE/SEQUESTRATION	39.89%	357
Total	100%	895

We identify a prevalence of the LOSS OF CONTENT scenario in NEW which helps journalists to describe particular pollution rates. The scenario identifies particular

polluters and particular sectors which are responsible for the damage. Extract (2) exemplifies this metaphorical use in newspapers.

(1) Now the bad news for the environment: Stansted airport alone is responsible for the **release** of the equivalent of around one tonne of CO2 into the atmosphere every six seconds. *The Times* October 27, 2007, Saturday Climate change: what we do and don't know[14]

In extract (1), the LOSS scenario illustrates how journalists explain the DAMAGE OF THE CONTAINER caused by climate change. The scenario emphasises the former condition of CO2, which was previously CONTAINED. However, the population's reliance on airplanes has altered this CONTAINMENT leading to the RELEASE of CO2. The journalist perceives this RELEASE in a negative light: in the beginning of the extract ("the bad news for the environment"), he/she explains the DAMAGE on the environment. This RELEASE results in the presence of the previously CONTAINED element (i.e., CO2) in the atmosphere. This presence leads to the alteration of the environment and therefore, to climate change (title of the article).

Extract (1) is here cited as an exemplary use of the DAMAGED CONTAINER narrative in NEW. Our investigation of the occurrences in our corpus indicates that the LOSS OF CONTENT scenario describes the over-reliance on polluting practice or elements (here, airplanes) and establishes this reliance as the cause of environmental damage.

8.2.1.2. The scenarios of materialisation of pollution

The results in Table 7 present a high frequency of materialisation scenarios in NEW between 2001 and 2017. We now focus on materialisation scenarios, which are particularly frequent in this genre.

The materialisation scenarios can be part of the EARTH AS A TRANSFORMED HOUSE narrative (section 6.2). They distinguish a NATURAL HOME from a DANGEROUS TRANSFORMED HOUSE. These scenarios can describe the progressive CONSTRUCTION (or DECONSTRUCTION) OF THE HOUSE, becoming a

[14] Extract (1) is an extra occurrence of the scenario discussed in Chapter 5

GREENHOUSE. The negative features attributed to the TRANSFORMED HOUSE are emphasised through the TRAP and HEATED CONTAINER scenarios. Alternatively, the BLANKET scenario conceptualises pollution as a WARM COVER (section 6.2.4). The perspective includes another narrative which defines POLLUTION AS A DANGEROUS TRACE (section 6.3). The related occurrences establish the SPACE/DIRECTION delimited by the FOOTPRINT(S) which cause climate change. The metaphor users attribute DIRTY or DANGEROUS features to the FOOTPRINT. They describe the SIZE OF THE FOOTPRINT to identify the BODY AT THE ORIGIN OF THE FOOTPRINT.

We now present the distribution of the materialisation scenarios in NEW articles. Table 10 illustrates this distribution.

Table 10: distribution of materialisation scenarios in NEW

Scenarios	Percentages	Occurrences
TRANSFORMED HOUSE	***78.1%***	***863***
DANGEROUS TRACE	21.9%	242
Total	100%	1,105

Table 10 shows that the NEW articles substantially favour the depiction of pollution in terms of a TRANSFORMATION OF THE HOUSE.

The EARTH AS A TRANSFORMED HOUSE narrative is characterised by a variety of metaphorical expressions, not restricted to the *greenhouse effect* metaphor. This is, however, not the case of the POLLUTION AS A DANGEROUS TRACE narrative which is exclusively identified in our corpus through the use of the metaphorical expression *footprint*. However, the use of *footprint* varies depending on the co-text which gives rise to a plurality of scenario-versions. The DANGEROUS TRACE narrative is less emphatic than the TRANSFORMED HOUSE narrative: the use of *footprint* in our corpus highlights that the TRANSFORMATION OF THE HOUSE has not occurred yet and focuses on mitigation. We present the distribution of the TRANSFORMED HOUSE scenarios. Table 11 illustrates this distribution in NEW.

Table 11: distribution of the TRANSFORMED HOUSE scenarios in NEW

Scenarios	Percentages	Occurrences
GREENHOUSE	***51.1%***	***441***
TRAP	***42.06%***	***363***
HEATED CONTAINER	3.82%	33
BLANKET	3.01%	26
Total	100%	863

Table 11 shows that, despite the "theory-constitutive" aspect of the *greenhouse effect* metaphor (Nerlich & Hellsten 2014; Boyd 1993: 486), NEW articles also frequently rely on the POLLUTION AS A TRAP scenario. This result is remarkable because the source domain of the EARTH AS A GREENHOUSE (51.1%) scenario comprises a plurality of features (containment, warmth, specific characteristics of the content) while the features of the POLLUTION AS A TRAP (42.06%) scenario limit the interpretation, emphasising a specific aspect of the *greenhouse effect*: the CONTAINMENT, which adds a more dramatic perspective. This is achieved through the POLLUTION AS A TRAP scenario which relies on different metaphorical expressions to convey particular characteristics to the CONTAINMENT, i.e. *trap*, *lock*, and *saturation*. Extract (3) illustrates the use of the scenario in NEW and highlights the characteristics attributed to the TRANSFORMATION OF THE HOUSE.

(2) But other **greenhouse gases**, such as methane, account for up to 40 per cent of the **greenhouse gas effect, trapping** the Sun's heat on Earth. *The Express* December 4, 2010 Saturday What a gas...surgery is now being blamed for global warming BYLINE: John Ingham[15]

Extract (2) exemplifies the use of the scenario in NEW. The occurrence of the metaphorical expression *trap* associated with the two occurrences of the *greenhouse* metaphor show that the TRAPPING feature helps the journalist to specify the use of the TRANSFORMED HOUSE narrative. The POLLUTION AS A TRAP scenario emphasises the CLOSED feature and attributes this feature to the GREENHOUSE. This

[15] Extract (2) is an extra occurrence of the scenario discussed in Chapter 6

emphasis highlights the danger of pollution because the TRAP scenario shows to the readership that the elements CONTAINED WITHIN THE GREENHOUSE (i.e., heat) cannot EXIT THE GREENHOUSE. The collocation of the GREENHOUSE and the TRAP source domains in extract (3) directs the readership's attention to the CLOSED feature of the GREENHOUSE.

The frequent reliance on the POLLUTION AS A TRAP scenario in NEW can be explained by the reported misleading understanding of the *greenhouse effect* metaphor (Deignan, Semino & Paul 2019: 389). Journalists specify the characteristics of the CONTAINMENT involved in the meaning of the *greenhouse effect* metaphor to promote a more dramatic picture of this effect to their wide readership.

In the following section, we discuss the less frequent scenarios in NEW. These scenarios are seldom used in the metaphorical representations of climate change in newspapers. We study and explain this limited use.

8.2.2. The less frequent scenarios in NEW: the eulogy of nature and the doom prediction

Table 12, below, shows that the scenarios of the deterioration of nature and the materialisation of pollution are typically used by journalists to metaphorically describe the effects of climate change in NEW while the scenarios associated with the eulogistic view on nature (9.85%) and with the doom prediction (13.03%) are more sporadically observed. We now investigate the more limited use of these two latter perspectives in NEW articles.

We first present the distribution of the eulogistic scenarios in NEW in Table 12.

Table 12: distribution of eulogistic scenarios in NEW

Scenarios	Percentages	Occurrences
GREENNESS	***46.77%***	***123***
HOME/FAMILY	19.77%	52
RELIGION	33.46%	88
Total	100%	263

Table 12 shows that the UNAFFECTED ENVIRONMENT AS GREEN scenario represents almost half of the eulogistic scenarios observed in NEW. In chapter 4, we have demonstrated that the idea of GREENNESS fulfils various arguments about climate change. It can be traced back to William Blake's poem describing England as "a green and pleasant land". The references to/ quotations of this poem in newspapers connect this colour to the unaffected version of the environment. GREEN is not only used as a metonymy referring to the colour of environmental resources (i.e., GREEN FOR THE ENVIRONMENT), it is also attributed a "pleasant" feature: a "*green* environment" is identified as a "pleasant environment". In the context of climate change, GREENNESS can characterise an environment that is not affected by the phenomenon (because it still presents pleasant features). The colour adjective can also be used to characterise measures, actions, elements (e.g., *green* cars) whose functions aim at conserving or recovering the pleasant features of the environment (which have been lost because of climate change). Metaphor users can raise doubts about the environmental benefits of GREEN referents. Extract (3) illustrates the use of the scenario in NEW.

(3) We need an agenda to make the world rich because a rich world is more educated, inventive and **green**. The wrong summit is happening in Paris. If world leaders devoted their time to slashing agriculture subsidies and the protectionism that suffocates trade across Africa and Latin America the benefits to poor nations would be many times bigger than reparations. It is a tragedy for the poor and the planet that the 21st climate change summit has learnt nothing from the 20 failed summits that went before. *The Times* December 7, 2015 Monday Climate change reparations are a ridiculous idea BYLINE: Tim Montgomerie [16]

[16] Extract (3) is an extra occurrence of the scenario discussed in Chapter 4

Extract (3) shows that the idea of GREENNESS can be used by journalists to depict an ideal future. The recovering of the environment is cited as a characteristic of this ideal future through the GREEN scenario. The link between the idea of GREENNESS and economic growth is prevalent in NEW.

Here, the journalist associates the idea of GREENNESS with economic prosperity ("to make the world rich"). The topic of the article deals with the financial "reparations" for climate damages in poorer countries. The journalist criticises this decision because such financial "reparations" are, in his opinion, not sufficient to implement real changes: the situation in poorer countries is such that populations are compelled to rely on industrialisation, and pollution. The journalist establishes potential solutions in economic but also environmental and cultural terms ("educated, inventive, and *green*").

In NEW, we notice that the ideal future promoted by the enactment of GREEN measures or actions (or the promotion of GREEN elements such as *green* cars) is opposed to financial arguments favouring economic growth. In (3), the journalist describes GREEN features (along other aspects such as education and innovation) as a consequence of economic growth leading to an ideal future.

We now focus on other less frequent scenarios used in NEW: Table 12 shows that journalists sporadically rely on scenarios associated with doom predictions. Table 13 illustrates the distribution of scenarios that compose this perspective in NEW.

Table 13: Distribution of doom prediction scenarios in NEW

Scenarios	Percentages	Occurrences
CRASHING TRANSPORT	3.45%	12
CONFLICT	***96.55%***	***336***
Total	100%	348

Table 13 shows that journalists do not often rely on the CRASHING TRANSPORT scenarios to describe the predictions about climate change. However, they discuss these predictions in terms of a CONFLICT with nature or pollution. Additional research shows

that the CONFLICT narrative is mostly composed of occurrences of the CLIMATE CHANGE DECISIONS AS A WAR scenario in NEW, as indicated by Table 14 below:

Table 14: Distribution of CONFLICT scenarios in NEW

Scenarios	Percentages	Occurrences
FORCED INTERACTION	17.26%	58
WAR	***52.08%***	***175***
CRIME	30.65%	103
Total	100%	336

Journalists mostly discuss the climate-related prediction in terms of a WAR involving Nature, pollution, and humanity. Extract (4) illustrates the journalistic use of the WAR scenario.

(4) All right, so George Monbiot didn't actually use the "s" word in his Guardian column today. (Like a Japanese soldier in 1944, he'd rather commit hara kiri than that). But the meaning is there all the same in key sentences like: "It's over." and "Now we must adapt to what nature sends our way. If we can." The significance could not be plainer. George "Moonbat" Monbiot, high priest of the Anthropogenic Global Warming movement (UK branch), has finally conceded what serious scientists have been saying all along. That there is nothing human kind can do to stop climate change. "Mitigation (limiting greenhouse pollution) has failed," he announces. (…) So let's say it one more time, shall we? George Monbiot, the eco-doommonger who - more than perhaps anyone in Europe - has been pushing for ever-more-stringent, intrusive and expensive government measures to **combat "climate change" has finally conceded that the war is lost**. *telegraph.co.uk* June 16, 2009 Tuesday Now even Moonbat has **surrendered** on global warming why can't Barry Obama? BYLINE: James Delingpole[17]

Extract (4) shows that the CLIMATE CHANGE DECISIONS AS A WAR scenario can fulfil sceptical arguments in newspapers. The journalist relies on the dangerous features involved in the meaning of WAR to justify the withdrawal of environmental policies. He refers to George Monbiot, a journalist from *The Guardian* and an environmental activist, and distinguishes Monbiot's recent stance on climate change from his past allegation. James Delingpole describes Monbiot's past articles through a first occurrence of the

[17] Extract (4) is an extra occurrence of the scenario discussed in Chapter 7

WAR scenario: "to combat 'climate change'". The scenario emphasises the extent to which Monbiot has argued for environmental policies: it is preceded by several references depicting Monbiot's past expectations (according to Delingpole), i.e. "ever-more-stringent, intrusive and expensive government measures". The association of these references and the scenario exaggerates Monbiot's stance. This exaggeration aims at mocking the left-wing journalist ("Moonbat") because the ENEMY, climate change, does not really exist according to Delingpole ("the "s" word"; use of inverted commas to refer to climate change). Additionally, the metaphorical occurrence CLIMATE CHANGE AS A RELIGION in the beginning of the extract reinforces the criticism: Monbiot is pictured as a HIGH PRIEST, believing in and FIGHTING against a fictitious phenomenon (see Chapter 4).

Delingpole contrasts Monbiot's ludicrous description with another occurrence of the WAR scenario ("the war is lost") to refer to the left-wing journalist's recent stance ("Now we must adapt to what nature sends our way. If we can."). This latter occurrence emphasises the criticism: it implies that Monbiot's fictitious beliefs have led to a WAR which has been LOST because of the fictive characteristics of the ENEMY. The dramatic features involved in the scenario strengthen the criticism because a LOST WAR involves destructive consequences. These consequences are relevant to interpret the scenario because of Delingpole's focus on environmental policies, which he perceives as destructive ("stringent, intrusive, expensive"). According to Delingpole, Monbiot's recent claims have prevented the evolution of such consequences and are therefore interpreted as a SURRENDER (in the title). However, Delingpole acknowledges that the WAR is still going on since he describes the former US President Barack Obama as a SOLDIER STILL FIGHTING ("why can't Barry Obama?").

In (4), the WAR scenario argues in favour of inaction: the destructive features are used to convince the metaphor recipients that environmental actions are not required because the WAR is already LOST. According to this interpretation, actions would increase (socio-political) destruction. In NEW articles, the WAR scenario overall depicts a FIGHT between humans and Nature, but journalists can adapt the scenario to provide different arguments related to this CONFLICT. The FORCED INTERACTION and CRIME scenarios are more sporadically used in newspapers.

We can explain these different distribution patterns by considering the different features of each scenario attributed to the topic of climate change. The WAR scenario involves national or international consequences. These consequences are precarious because of the LETHAL feature involved in the meaning of the source domain. Comparatively, the CRIME scenario relies on a source concept which can also depict more delimited effects (e.g., focus on the identity of the CRIMINAL and on the INVESTIGATION, see section 7.3.3). The FORCED INTERACTION scenario emphasises uncertainty regarding the evolution of climate change. Hence, the WAR scenario illustrates the general effect of environmental decisions whilst the CRIME and FORCED INTERACTION scenarios highlight the significance of scientific finding by establishing the cause of particular events.

In the following sections, we investigate the distribution of scenarios in the scientific papers. This investigation highlights a specific metaphorical focus in this genre.

8.3. The distribution of scenarios in SCI

The SCI articles published in *Nature* between 2001 and 2017 amount to 331 articles. The average number of words per articles is estimated at 1,712.178 words (total number of words in SCI: 566,731). We have selected 342 scenarios in SCI whose features correspond to the features identified in previous chapters (see below). Table 15 presents the number of SCI articles per year, the average number of words per article, and the number of scenarios per year. Table 16 presents the distribution of the different scenarios per perspective. The percentages displayed in Table 16 represent the frequency of use of the scenarios that are part of a particular perspective among the totality of scenarios observed in SCI.

Table 15: Number of articles/ scenarios per year and average number of words in SCI

Year	**Number of articles**	**Average number of words**	**Scenarios (occurrences)**
2001	27	1,258.741	17
2002	18	1,789.389	19
2003	16	1,705.763	21
2004	35	1,200.686	30
2005	24	1,211.25	17
2006	18	1,951.389	31
2007	19	1,062.211	14
2008	19	1,397.368	19
2009	22	1,417.955	24
2010	26	1,559.346	22
2011	22	1,875.182	24
2012	16	1,926.125	22
2013	12	2,352.75	18
2014	13	2,970	11
2015	18	2,275.389	21
2016	15	2,477.933	20
2017	11	2,865.182	12

Table 16: distribution of scenarios per perspective in SCI

Perspectives	Percentages	Occurrences
Eulogy	1.46%	5
Deterioration	21.05%	72
Materialisation	30.41%	104
Doom Prediction	***47.08%***	***161***
Total	100%	342

Table 16 shows that the SCI articles mainly rely on the scenarios of doom prediction. This latter perspective represents almost half of the scenarios identified in SCI (47.08%) whilst the scenarios of materialisation and of deterioration still represent relatively high frequencies in these articles (30.41% and 21.05%, respectively). We also notice that scientists rarely use eulogistic scenarios (1.46%). In the following sections, we discuss the distribution of SCI scenarios.

8.3.1. The salient scenarios in SCI: doom prediction

Table 16 shows that the scenarios related to doom prediction are the most salient in SCI articles. We start the discussion of this result by outlining the particularities of these scenarios.

The perspective on doom prediction is composed of two main narratives. The CRASHING TRANSPORT narrative describes a CONTAINER which is metaphorically linked to the topic of climate change (BOAT, TRAIN and PLANE). This CONTAINER is described as FAULTY with reference to forthcoming dangerous situations. These FAULTS can be metaphorically interpreted in terms of a FAULTY TRANSPORT, a CRASH, or a DANGEROUS JOURNEY/DESTINATION (or a BENEFICIAL DESTINATION THAT CANNOT BE REACHED).

The second narrative related to doom predictions is CLIMATE CHANGE AS A CONFLICT. It comprises the CLIMATE CHANGE AS A FORCED INTERACTION scenario: this scenario describes a process involving a non-human entity (e.g., climate) DISTURBED as a consequence of a human or non-human action, i.e. “anthropogenic climate *forcing*”, and the RESPONSE/ FEEDBACK describes a REACTION resulting from a range of environmental disruptions. The CONFLICT narrative also comprises the CLIMATE CHANGE DECISIONS AS A WAR and CLIMATE CHANGE AS A CRIME scenarios attributing a particular role to environmental issues characterised by their conflictual features and including descriptions of JUSTICE to represent a resolution in terms of CRIME PUNISHMENT.

We have distinguished the distribution patterns of the related scenarios in *Nature*. This investigation shows that the doom predictions in SCI are exclusively discussed in the CONFLICT narrative. The CONFLICT narrative is composed of different scenarios whose distribution in SCI is represented in Table 17.

Table 17: distribution of CONFLICT scenarios in SCI

Scenarios	Percentages	Occurrences
FORCED INTERACTION	***91.3%***	***147***
WAR	0.62%	1
CRIME	8.07%	13
Total	100%	161

Table 17 shows that the CONFLICT scenarios in SCI predominantly present this CONFLICT in terms of a FORCED INTERACTION (91.3%). The CLIMATE CHANGE AS A CRIME scenario is only sporadically used by scientists (8.07%) and the CLIMATE CHANGE DECISIONS AS A WAR scenario has only been observed once in these articles.

The CLIMATE CHANGE AS A FORCED INTERACTION scenario establishes a causal link between different elements (i.e., human activities) whose occurrence causes changes in environmental patterns (i.e., climate). In *Nature*, scientists describe a phenomenon called "climate *forcing*" whose use in the text is semantically similar to the non-metaphorical expression "climate change". This metaphorical expression may have been favoured by scientists following the findings about the origin of climate change: human pollution. Additionally, this scenario is extended to refer to a RESPONSE or FEEDBACK resulting from this FORCING. These metaphorical concepts convey a PHYSICAL feature to natural resources which can be FORCED in such a way that their patterns are subjected to an alteration. The scenario also conveys a HUMAN feature to natural resources which are attributed the ability to RESPOND to this FORCING. Extract (5) illustrates this use in SCI.

(5) Earth's history tells us that climate has often **responded to forcing** in a sensitive, nonlinear and unpredictable way. *Nature* volume464, page681 (01 April 2010) "How ocean stirring affects climate" Stefan Rahmstorf [18]

Extract (5) shows that CLIMATE CHANGE AS A FORCED INTERACTION scenario can be used in scientific papers to illustrate the evolution of climate. This scenario involves a gradual process (e.g., gradual amount of polluting gases being released in the atmosphere) which results in climate's RESPONSE. This extract shows that this RESPONSE can take place in different ways. The RESPONSE refers to a general metaphorical understanding of environmental evolution which has been successively altered following the FORCING. Here, the RESPONSE is characterised as "sensitive, nonlinear, and unpredictable". The FORCED INTERACTION scenario metaphorically describes scientific observations about the altered evolution of climate. The INTERACTION involved in the FORCING ascribes concrete features to the more specific and detailed observations of this altered evolution. We can infer that the FORCED INTERACTION scenario in *Nature* results from scientists' aim at raising the metaphor recipients' awareness about the impact of human activities on the climate, resulting in climate change (or, CLIMATE RESPONSE). They rely on the FORCED INTERACTION scenario to convey concrete features to the target domain (i.e., affected evolution of climate) which facilitates the communication of scientific findings. This scenario describes climate change as a causal link between different events, which is not conveyed by the expressions "climate change" or "global warming".

8.3.2. The less frequent scenarios in SCI: materialisation, deterioration, and eulogy of nature

Table 16 shows that the scenarios of doom prediction are prevalent in SCI. Comparatively, the scientific articles in our corpus do not display equally high frequency of scenarios that are part of the three other perspectives: the eulogistic view on nature, the deterioration of nature, and the materialisation of pollution. This disparity may be caused

[18] Extract (5) is an extra occurrence of the scenario discussed in Chapter 7

by the limited size of our SCI corpus (331 articles) but this sample of scientific discussion on climate change helps us to investigate the use of scenarios in this genre.

We first present the distribution of scenarios related to the materialisation of pollution in SCI. This distribution represents 30.41% of the SCI scenarios. This perspective comprises the narratives EARTH AS A TRANSFORMED HOUSE and POLLUTION AS DANGEROUS TRACE.

The distribution of materialisation scenarios shows that scientists, like journalists, favour the description of the effect of pollution in terms of a TRANSFORMED HOUSE (95.19% of the materialisation scenarios), while the DANGEROUS TRACE narrative only represents 4.81% of the occurrences within this perspective.

We distinguish the different scenarios in SCI articles related to the narrative EARTH AS A TRANSFORMED HOUSE. Table 18 illustrates this distribution.

Table 18: Distribution of TRANSFORMED HOUSE scenarios in SCI

Scenarios	Percentages	Occurrences
GREENHOUSE	***69.7%***	***69***
TRAP	29.3%	29
HEATED CONTAINER	0%	0
BLANKET	1.01%	1
Total	100%	99

Table 18 shows that the TRANSFORMED HOUSE narrative in SCI mostly describes pollution in terms of a TRANSFORMATION OF THE EARTH INTO A GREENHOUSE. The scenario POLLUTION AS A TRAP is also relatively frequent (29.3%) while other scenarios rarely occur (or do not occur at all) in SCI. In our corpus, we notice that scientists use the TRAP scenario to illustrate the dangerous effect of the gases which TRANSFORM THE EARTH INTO A GREENHOUSE ("heat-*trapping greenhouse* gases"). The GREENHOUSE scenario focuses on the human origin of pollution and on the relation between pollution and climate change. Hence, this frequency can be related to the frequency of the FORCED INTERACTION scenario which also focuses on the impact of pollution on the environment. The EARTH AS A

GREENHOUSE scenario highlights the specific origin of pollution: humans. It illustrates the evolution of human pollution and its impact on the climate or the environment. The related scenario-versions present images of humans TRANSFORMING THE HOUSE by ADDING DANGEROUS MATERIAL (i.e., *greenhouse gases*). These versions can also present images of humans expected to DECONSTRUCT THE TRANSFORMED HOUSE or to REMOVE THE MATERIAL. Extract (6) illustrates the use of the scenario in a SCI article.

(6) Here we use 80-year integrations from the CMIP2 (second coupled model intercomparison project) multi-model ensemble of 19 global coupled ocean–atmosphere climate models as discussed in the recent IPCC assessment. This increase in CO_2 is somewhat faster than is anticipated for the twenty-first century, but its use can be justified from the neglect of other **anthropogenic greenhouse gases** in CMIP2. *Nature* volume415, pages512–514 (31 January 2002) "Quantifying the risk of extreme seasonal precipitation events in a changing climate" T. N. Palmer & J. Räisänen[19]

Extract (6) shows that the adjective "anthropogenic" qualifies the target (i.e., pollution) of the GREENHOUSE scenario (while both source and target domains share a "+human" feature). The MAN-MADE origin of the GREENHOUSE is highlighted to emphasise the role of particular gases in the development of climate change as opposed to the gases which are not emitted by humans (e.g., natural *greenhouse effect*). The scientists demonstrate that CO2 is not the only "anthropogenic gas" which plays a role in the evolution of climate: humans emit various kinds of gas which also alter the temperatures. However, these other gases have decreased in the 21st century ("neglect") which resulted in the increase of CO2. From our observations, the occurrences of the EARTH AS A GREENHOUSE scenario in SCI focus on this human origin to link the evolution of climate change to the evolution of pollution. When scientific findings show an increase of temperatures (over a particular period or place), this is explained by the gases that have been added by humans during this period. This human origin is also described in *Nature* to discuss solutions to prevent a dangerous evolution of climate change (i.e., emission reduction).

[19] Extract (6) is an extra occurrence of the scenario discussed in Chapter 6

We now focus on another perspective which has been observed less frequently in SCI articles. The scenarios related to the deterioration of nature do not represent a major metaphorical perspective in *Nature* (21.05%). This perspective is composed of two main narratives which conceptualise NATURE AS A DAMAGED BODY and NATURE AS A DAMAGED CONTAINER. Table 19 illustrates the distribution of these scenarios in SCI.

Table 19: distribution of deterioration scenarios in SCI

Scenarios	Percentages	Occurrences
DAMAGED BODY	4.17%	3
DAMAGED CONTAINER	***95.84%***	***69***
Total	100%	72

Table 19 shows that scientists most frequently describe the deterioration of nature through the DAMAGED CONTAINER narrative (95.84%). The DAMAGED BODY narrative relies on emotional features related to PHYSICAL SUFFERING which may not correspond to the scientific stance aiming at providing an objective discussion of findings. The deterioration as a DAMAGED CONTAINER can be expressed in terms of a LOSS or CAPTURE OF CONTENT in SCI articles.

Table 20: Distribution of DAMAGED CONTAINER scenarios in SCI

Scenarios	Percentages	Occurrences
LOSS	***49.27%***	***34***
CAPTURE/SEQUESTER	***50.72%***	***35***
Total	100%	69

Table 20 shows that scientists metaphorically depict deterioration as being caused by a LOSS OF CONTENT as frequently as a deterioration being solved by the CAPTURE OF THE CONTENT. This distribution shows that scientists do not only describe their observations of the effect of pollution, they also analyse potential solutions.

Table 16 shows that the use of the eulogistic perspective is minimal in SCI articles (1.46%). This may be explained by the ideological function of the related scenarios which contradicts the documented view on scientific findings in *Nature*.

Our research shows that the eulogistic perspective in SCI is mostly composed of occurrences of the scenario HUMANITY/NATURE AS A FAMILY (60% of all eulogistic scenarios in SCI, 3 occurrences) while the UNAFFECTED ENVIRONMENT AS GREEN and the CLIMATE CHANGE AS A RELIGION scenarios have only been observed once, respectively. The use of the FAMILY scenario in *Nature* focuses on the NURTURING ability of natural resources: a natural resource is described as a FAMILY MEMBER. In the context of climate change, this illustrates how the disappearance of a natural resource can affect the environment.

In the following section, we discuss the use of scenarios in environmental communication (ENV).

8.4. The distribution of scenarios in ENV

Our investigation of environmentalist discourse about climate change highlights specific use of scenarios. The environmentalist publications under study are publications from the Non-Governmental Organisation *Friends of the Earth*. We have selected 867 ENV articles dealing with climate change. The average number of words of these articles is 621.323 (total number of words in ENV: 538,687). Our research of metaphor scenarios has resulted in the identification of 316 ENV scenarios.

Table 21 presents the number of ENV articles per year, the average number of words, and the number of scenarios per year. Table 22 presents the distribution of the scenarios observed in ENV. The percentages in Table 22 represent the frequency of use of scenarios that are part of one perspective among the totality of ENV scenarios.

Table 21: Number of articles/ scenarios per year and average number of words in ENV

Year	**Number of articles**	**Average number of words**	**Scenarios (occurrences)**
2001	95	554.86	10
2002	135	575.55	31
2003	112	602.48	18
2004	69	593.39	18
2005	73	655.53	28
2006	57	796.98	20
2007	41	722.68	31
2008	32	576.06	20
2009	40	584.48	34
2010	41	580.54	16
2011	29	641.34	16
2012	27	658.26	13
2013	20	671.95	11
2014	25	605.68	18
2015	32	712.56	23
2016	30	656.07	6
2017	9	432.22	3

Table 22: Distribution of scenarios in ENV

Perspectives	Percentages	Occurrences
Eulogy	13.29%	42
Deterioration	23.73%	75
Materialisation	23.1%	73
Doom Prediction	***39.87%***	***126***
Total	100%	316

Table 22 shows that *Friends of the Earth* favour the perspective of doom prediction (39.87%) to describe the evolution of climate change. This recalls our findings in SCI articles which also favour this perspective. However, the scenarios in ENV are more evenly distributed: the scenarios of the deterioration of nature and the materialisation of pollution are almost equally frequent (23.73% and 23.1%). Like SCI articles, ENV communication also displays a limited use of eulogistic scenarios, although they still represent 13.29% of the scenarios observed in this genre.

In the following section, we focus on the salient scenarios in ENV, which are related to doom prediction. We then provide more details about the occurrences of the less frequent scenarios.

8.4.1. The salient scenarios in ENV: doom prediction

Table 22 shows that environmentalists frequently rely on the scenarios of doom prediction to communicate about climate change. We study the use of scenarios by *Friends of the Earth* to identify specific metaphorical description of climate change in this genre.

The specificity of the doom prediction scenarios in ENV is comparable to the characteristics we have discussed in section 8.3.1. about the use of these scenarios in *Nature*. Our research has demonstrated the absence of CRASHING TRANSPORT scenarios in ENV. Therefore, the doom prediction is exclusively described by environmentalists through CLIMATE CHANGE AS A CONFLICT narrative. Table 23 illustrates the distribution of the CONFLICT scenarios in ENV.

Table 23: distribution of CONFLICT scenarios in ENV

Scenarios	Percentages	Occurrences
FORCED INTERACTION	0%	0
WAR	2.38%	3
CRIME	***97.62%***	***123***
Total	100%	126

Table 23 shows that *Friends of the Earth* mostly describe climate change as a CONFLICT which is metaphorically shaped as a CRIME (97.62%). Unlike scientists, they do not use scenarios to illustrate a FORCED INTERACTION. They rarely use the CLIMATE CHANGE DECISIONS AS A WAR scenario (3 occurrences) in their publications. We can link the environmentalists' focus on CLIMATE CHANGE AS A CRIME to the promotion of environmental actions in the articles. They use the CRIME scenario to picture the environment as a VICTIM of pollution who needs to be RESCUED by appropriate decisions. *Friends of the Earth* also blame a range of polluting sectors/industries and rely on the CRIME scenario to emphasise the effect of pollution on particular areas and communities. They perceive these effects as an INJUSTICE because polluters do not suffer from the consequences of pollution while other areas/communities whose pollution rate is minimal are experiencing the damages of climate change. Extract (7) illustrates this use in ENV.

(7) Targeting ExxonMobil, the biggest US corporation and its highest profile oil company, will spearhead the boycott campaign and send a message to Bush and all oil companies that the US has to take **climate justice** seriously NOW. *Friends of the Earth* 18 June 2001 "Exxonmobil (Esso) international day of action: 11th of July" [20]

Extract (7) shows an exemplary use of CLIMATE CHANGE AS A CRIME scenario in ENV which is interpreted in terms of A LACK OF JUSTICE. ExxonMobil, as well as "all oil companies", are pictured as CRIMINALS because of their responsibility for climate change. *Friends of the Earth* rely on the emotional impact promoted by the features of the scenario to emphasise the need for JUSTICE and convince the US government to regulate the pollution associated with this sector. The pollution emitted by these companies is described through a specific focus on environmental damages. This focus promotes the use of the JUSTICE scenario-version corresponding to the conceptualisation of THE EFFECT OF INDUSTRIAL POLLUTION AS A CRIME.

In the following section, we discuss the use of less frequent scenarios in ENV.

[20] Extract (7) is an extra occurrence of the scenario discussed in Chapter 7

8.4.2. The less frequent scenarios in ENV: deterioration, materialisation, and eulogy

Table 22 shows that ENV articles rely on the deterioration and materialisation perspectives in a more limited way, compared to the relevance of the doom prediction scenarios. Additionally, it shows that the eulogistic perspective represents a minimal use of scenarios. We first present the occurrences of the materialisation and deterioration scenarios in *Friends of the Earth* publications. Then, we move to the use of the eulogistic perspective in ENV.

Table 22 shows that the materialisation and deterioration scenarios are evenly distributed in ENV. We first focus on the materialisation of pollution. We notice that *Friends of the Earth* mainly depict pollution as TRANSFORMING THE HOUSE (86.3% of the materialisation scenarios in ENV) while they seldom rely on the conceptualisation of pollution as leaving a DANGEROUS TRACE (13.7%).

Table 24 illustrates the distribution of the scenarios related to the EARTH AS A TRANSFORMED HOUSE narrative in ENV.

Table 24: Distribution of TRANSFORMED HOUSE scenarios in ENV

Scenarios	Percentages	Occurrences
GREENHOUSE	***88.89%***	***56***
TRAP	9.52%	6
HEATED CONTAINER	1.59%	1
BLANKET	0%	0
Total	100%	63

Table 24 shows that environmentalists mostly focus on pollution as TRANSFORMING THE EARTH INTO A GREENHOUSE (88.89%). They sporadically describe pollution as forming a TRAP (9.52%). The other existing scenarios are negligible or absent from ENV articles (HEATED CONTAINER and BLANKET scenarios). *Friends of the Earth* focus on the DIRTY and DANGEROUS aspects of pollution: we can explain this finding through the aim of environmentalists' publications which promotes environmental actions. This is illustrated in the example below:

(8) Global warming is caused by **harmful greenhouse gases**. Most of them are released by the richest nations of the planet, causing rising temperatures and more extreme weather events such as droughts and floods. *Friends of the Earth*, 18 December 2004 "Poorest lose out at climate change talks"[21]

Extract (8) shows an exemplary use of the DIRTY/DANGEROUS TRANSFORMATION OF THE EARTH INTO A GREENHOUSE scenario-version in ENV. In this extract, the environmentalists do not only link the presence of *greenhouse* gases to global warming, they also emphasise their dangerous characteristics through the adjective "harmful" and through examples of climate change-related events which are described as consequences of gas emissions. *Friends of the Earth* depict GASES AS DANGEROUS MATERIAL which "the richest nations" need to REMOVE (although this REMOVAL is not explicitly described in the extract) to prevent additional catastrophic weather events ("droughts and floods").

The global effect of pollution emphasised by THE EARTH AS A GREENHOUSE scenario (i.e., relying on the idea of a SHARED TRANSFORMED HOUSE) explains the environmentalists' focus on this metaphorical conceptualisation. In contrast, the scenario POLLUTION AS FOOTPRINT(S) still involves the idea of a SHARED NATURAL HOME which is affected by A DANGEROUS TRACE. Hence, this latter scenario is less dramatic and may not favour effective arguments to reduce pollution.

We now focus on the use of deterioration scenarios in ENV. Table 22 shows that these scenarios are also relatively frequent in environmentalist publications (23.73%). We study the specific use of these scenarios in ENV. The deterioration perspective is composed of two main narratives: NATURE AS A DAMAGED BODY and NATURE AS A DAMAGED CONTAINER. Table 25 illustrates the distribution of deterioration scenarios in ENV.

[21] Extract (8) is an extra occurrence of the scenario discussed in Chapter 6

Table 25: Distribution of deterioration scenarios in ENV

Scenarios	Percentages	Occurrences
DAMAGED BODY	4%	3
DAMAGED CONTAINER	***96%***	***72***
Total	100%	75

Table 25 shows that *Friends of the Earth* mostly describe the deterioration of nature through the DAMAGED CONTAINER narrative (96%). As seen in relation to the distribution patterns of the materialisation scenarios in ENV, the environmentalists seem to favour a global perspective on the effects of climate change (whilst the CRIME scenario focuses on specific responsibility), which can explain this frequency. Our research demonstrates that environmentalists favour the metaphorical description of this DAMAGE in terms of a LOSS OF CONTENT.

Table 26: Distribution of DAMAGED CONTAINER scenarios in ENV

Scenarios	Percentages	Occurrences
LOSS	***77.78%***	***56***
CAPTURE/SEQUESTER	22.22%	16
Total	100%	72

Table 26 shows that, like journalists, environmentalists depict climatic deterioration more frequently through metaphorical expressions associated with a LOSS OF CONTENT (77.78%). Extract (9) illustrates the use of this scenario in ENV.

> (9) "G8 countries currently **release** 45 per cent of today's global emissions, and are the main decision makers in the World Bank. As such they are in a position to make a significant contribution to the **fight** against climate change" said Elizabeth Bast of Friends of the Earth US. *Friends of the Earth*, 19 April, 2006 "World Bank's Climate Plan fails to show the right path" [22]

[22] Extract (9) is an extra occurrence of the scenario discussed in Chapter 5

Extract (9) shows that *Friends of the Earth* use the LOSS scenario to illustrate the consequence of particular non-environmentally-friendly actions. These actions are attributed to the countries which are responsible for the RELEASE: the G8 countries. In this extract, the environmentalists metaphorically create a scale related to the emissions produced by the G8 countries (i.e., countries involved in international decisions) and the emissions produced by other countries of the world. This distinction is emphasised because the environmentalists criticise the role given to polluting countries in climate change mitigation. They contrast this role with the metaphorical expression *fight* which illustrates the extent of the actions required for this mitigation, i.e. they conceptualise ENVIRONMENTAL DECISIONS AS A FIGHT, while decision makers are RELEASING damaging gases.

The DAMAGED BODY narrative is more sporadically used in these publications. This can be explained by the features of the associated source concepts which describe particular effects of pollution on specific natural resources. The LOSS scenario links particular polluting activities to the wider consequences they involve, which fits the environmentalists' stance on the consequence of pollution.

Table 22 demonstrates a more limited use of eulogistic scenarios by environmentalists (13.29% of all ENV scenarios). The distribution of eulogistic scenarios in *Friends of the Earth* publications shows that the most frequent eulogistic conceptualisation of climate change is related to the UNAFFECTED ENVIRONMENT AS GREEN scenario (71.43% of all eulogistic scenarios in ENV). The narratives EARTH AS A HOME AND HUMANITY/NATURE AS A FAMILY and CLIMATE CHANGE AS A RELIGION only occur in a very limited way (19.05% and 9.52%, respectively).

Our data show that the idea of GREENNESS is frequently questioned in ENV articles, as in:

> (10) Kate Hampton of Friends of the Earth International said: "The United States is the world's biggest polluter. It is outrageous that President Bush is still refusing to cut emissions in order to avoid upsetting the powerful US fossil fuel lobby. (…) This is an insult to other countries who gave their backing to the Kyoto Protocol in Marrakech last year. World leaders must not play along with **this green con trick** and continue to press him to ratify Kyoto." *Friends of the Earth*, 14 February 2002

> "President Bush's climate policy, released today, was condemned by Friends of the Earth International as his latest climate con"[23]

Extract (10) shows an exemplary use of the GREEN scenario in ENV. *Friends of the Earth* criticise the former US president's stance on emission reduction. Kate Hampton distinguishes Bush's decisions from other governmental decisions taken in other countries. This distinction is qualified as being a *green con trick*: while the Kyoto Protocol has been ratified in various countries, the "world's biggest polluter" is not involved in this agreement. This decision makes the expected objectives of the Protocol impossible to reach, at a global level. The main argument that can be inferred from the use of the scenario is that *Friends of the Earth* call the countries which have ratified the Protocol not to follow the example set by the US and, instead, to convince Bush about the benefits of the environmental decisions they have previously enacted. The GREEN scenario refers to the characteristics of the Protocol (i.e., protection of the environment) and its collocation with the phrase "con trick" establishes the impact of the US position on international decisions about the environment.

We now investigate the use of scenarios in POL. This research highlights specific uses of metaphors by politicians in their speeches describing climate change.

8.5. The distribution of scenarios in POL

POL extracts have been selected from 44 speeches produced by British politicians to discuss climate change. This limited number of relevant speeches may be related to the *Britishpoliticalspeech* archives, from which we accessed speeches from the Labour, Conservative, and Liberal Democrat parties. Our limited number of speeches on environmental topics may indicate that politicians have a specific way to deal with the topic and avoid the use of specific terms such as "climate change" and "global warming" (which have helped us to build our corpus, see Chapter 3). The POL speeches demonstrate the way scenarios about the environment can be used in politics. The average number of

[23] Extract (11) is an extra occurrence of the scenario discussed in Chapter 4

words per speech is 4,732.841 (total number of words in POL: 208,245). We identify 24 occurrences of scenarios.

The distribution of the scenarios in POL demonstrates the specific metaphorical descriptions of climate change by politicians. Table 27 presents the number of speeches per year, the average number of words per speech, and the number of scenarios per year. Table 28 presents the distribution of scenarios in POL. The percentages displayed in Table 28 represent the frequency of use of the scenarios pertaining to one perspective among the totality of scenarios in POL.

Table 27: Number of articles/ scenarios per year and average number of words in POL

Year	**Number of articles**	**Average number of words**	**Scenarios (occurrences)**
2001	4	3,735.75	0
2002	2	2,545.5	0
2003	2	4,810	1
2004	1	4,462	1
2005	2	3,463	0
2006	5	4,639.4	3
2007	6	4,852.17	4
2008	4	4,641	1
2009	3	5,278.33	4
2010	4	4,117.75	3
2011	2	5,081.5	1
2012	1	4,350	1
2013	2	6,947	1
2014	2	5,965	2
2015	2	6,508.5	0
2016	1	5,863	0
2017	1	5,106	2

Table 28: Distribution of scenarios in POL

Perspectives	Percentages	Occurrences
Eulogy	***66.67%***	***16***
Deterioration	25%	6
Materialisation	4.17%	1
Doom Prediction	4.17%	1
Total	100%	24

Table 28 shows a prevalence of scenarios related to the eulogistic perspective on nature (64.67%). Although the limited amount of POL speeches does not allow us to draw significant conclusions about this use, we can note that it is the only genre we have investigated which favours this perspective. We can also note the sporadic use of the perspective of the deterioration of nature (25%). The scenarios related to the materialisation of pollution and to doom prediction are used in a negligible way (one occurrence, respectively).

In the following section, we analyse the specific use of the salient scenarios in POL. We then investigate the use of less frequent scenarios observed in this genre.

8.5.1. The salient scenarios in POL: eulogy of nature

Table 28 shows that POL speeches rely on scenarios displaying a eulogistic view on (unaffected) nature. This metaphorical use in political speeches about climate change has not been documented in existing literature. The metaphorical eulogy (in Chapter 4) distinguishes a previous or imaginary state of nature before or without climate change from the present state of nature which has been affected by the phenomenon (e.g., references to the pre-industrial period opposed to industrial pollution).

We identify the eulogistic perspective through the idea of GREENNESS which can either promote environmental decisions or question the environmental benefits of these decisions. The HOME-FAMILY narrative depicts the Earth as a HOME SHARED

BY HUMANITY. The HOME concept "entails" images of humanity forming a FAMILY. This FAMILY can be limited to humans or to natural elements, or it can identify humanity and nature as FAMILY MEMBERS. The CLIMATE CHANGE AS A RELIGION narrative relies on the idea that humanity has to cope with a HIGHER AUTHORITY which has to be respected to avoid climate change.

Our investigation of the eulogistic scenarios in POL shows that this perspective is exclusively identified through the scenario associated with the idea of GREENNESS. The political use of the colour adjective *green* to characterise environmental policies can explain this finding. POL speeches discuss climate change through eulogistic pictures of a GREEN environment. The POL scenario does not frequently display a questioning of the positive features related to the idea of GREENNESS. Politicians rely on a metaphorical picture of a pleasant and unaffected nature expressed through the colour adjective to characterise this beneficial aspect. The idea of GREENNESS promotes particular policies or ideologies which involve images of an ideal future. Extract (11) illustrates this use.

> (11) It is only by governing that we will have the opportunity to build a society that is **free, fair and green**. (…) And when that moment comes, to ensure that we are ready to build a Britain that is **free, fair and green**. 21/09/2006 Leader's speech, Brighton Menzies Campbell (Liberal Democrat)[24]

Extract (11) shows that the idea of GREENNESS is characterised by the collocation of the adjective *green*. The collocating adjectives can be interpreted as positive: "free, fair". This collocation has not only been observed in this speech from the Liberal Democrats. The same collocation has also been produced by David Cameron (Conservative) and Gordon Brown (Labour) who similarly rely on positively oriented adjectives to specify the interpretation of *green*. The occurrence of this collocation of *green* with positive adjectives shows that speeches from opposing political parties all display a positive picture of the environment unaffected by climate change, even if these parties share different opinions about climate change mitigation. In this extract, the UNAFFECTED ENVIRONMENT AS GREEN scenario attributes a particular role to the protection of the environment in the development of a free and fair society.

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[24] Extract (11) is an extra occurrence of the scenario discussed in Chapter 4

We now analyse the less frequent scenarios in POL. Although the very limited use of these scenarios does not allow us to draw particular conclusions, we illustrate how the selected scenarios are used in POL.

8.5.2. The less frequent scenarios in POL: deterioration, materialisation, and doom prediction

Because of the limited amount of political speeches in our corpus, the details associated with these scenarios have to be carefully treated in terms of their significance in political communication. The details discussed here are more limited than in the other genres (e.g., only one occurrence of materialisation and doom prediction scenarios, respectively).

We first study the use of the deterioration scenarios in POL. We have observed 6 related occurrences, representing 25% of the totality of POL scenarios (Table 28). Our research shows that politicians describe the deterioration of nature through exclusive reliance on the DAMAGED CONTAINER narrative. Unlike the other genres, POL speeches exclusively rely on this narrative to depict the CAPTURE OF CONTENT (the totality of the occurrences). Extract (12) illustrates the use of this scenario in POL.

> (12) We are already global leaders in wind power, **green cars, clean coal and carbon capture**. And now we will lead again, with new designated low carbon zones around the regions of this country. And I say to you today – we will create over a quarter of a million **new green British jobs**. 29/09/2009 Leader's speech, Brighton Gordon Brown (Labour)[25]

Extract (12) shows that the CAPTURE OF CONTENT (i.e., carbon) is perceived positively by the former UK Prime Minister. He discusses this CAPTURE through the idea of a CLEAN environment ("*clean* coal") and through the description of GREEN entities whose features are expected to protect the environment ("*green* cars"; "*green* jobs"; see Chapter 4). This CAPTURE is not only presented as limiting the damages caused by climate change and pollution (see Chapter 5), it is also cited as a feature that promotes a better future for Britain ("And now we will lead again"; "we will create over a quarter of a million new *green* jobs"). Hence, this extract associates the CAPTURE with

[25] Extract (12) is an extra occurrence of the scenario discussed in Chapter 5

the protection of the environment and with economic prosperity (which is comparable to the use of the GREEN scenario in POL). The politician compares the effects of the CAPTURE with the description of areas characterised by their lower amount of the CONTENT ("low carbon zones"). Gordon Brown conceptualises the absence of the CONTENT in the atmosphere as a distinguishing feature of British prosperity.

The occurrence of the perspective of materialisation of pollution in POL focuses on the DIRTY/DANGEROUS MATERIAL OF THE TRANSFORMED HOUSE to depict the effect of pollution. Extract (13) illustrates the use of the scenario in POL.

> (13)We will increase the amount of energy from renewable sources fivefold; ensure every major business in the country has a responsibility for **greenhouse gas reduction**; treble investment in **clean** technology, including **clean** coal; and make sure every new home is at least 40% more energy efficient. 26/09/2006 Leader's speech, Manchester 2006 Tony Blair (Labour) [26]

Extract (13) shows that the DIRTY/DANGEROUS MATERIAL OF THE TRANSFORMED HOUSE scenario-version has been identified through the link produced by the politician between a reduction of the MATERIAL (i.e., *greenhouse gas*) and the CLEAN characteristics of "technology" and "coal" which are expected to prevent a detrimental TRANSFORMATION OF THE HOUSE.

The doom prediction scenario in POL shows that its occurrence is related to the CONFLICT narrative (the CLIMATE CHANGE DECISIONS AS A WAR scenario, see extract 11 in Chapter 7). This doom picture of the evolution of climate change raises the British population's awareness about environmental damage to convince metaphor recipients about the relevance of environmental decisions (among other political decisions).

In the following section, we pay attention to the occurrence of genre-specific scenarios in our corpus. These particular scenarios have exclusively been observed in a single genre or rarely occur in other genres.

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[26] Extract (13) is an extra occurrence of the scenario discussed in Chapter 6

8.6. Genre-specific distribution of scenarios

The distribution patterns of narratives and scenarios within the four genres reveal the occurrence of genre-specific scenarios, i.e. scenarios which have been used in a single genre whereas we did not observe any occurrence of these scenarios (or only a few occurrences) in the other genres. The following results establish that these genre-specific scenarios are mostly found in newspaper articles. The absence or rare use of these particular scenarios in the scientific, environmental, and political discourses reveals that journalists can also produce climate change metaphors without relying existing metaphorical conceptualisations which may originate in scientific observations related to climate change (although such findings can be explained by the higher amount of newspaper articles in our corpus).

As part of the perspective of the deterioration of nature (Chapter 5), the distribution of scenarios in the four genres shows that the depiction of the *ozone hole* as a WOUND is specific to newspapers. The *ozone hole* metaphor may have been perceived as being too abstract for the newspaper readership, which can explain the occurrence of a different scenario produced by journalists.

The WARMING AS A BLANKET scenario, which is part of the perspective of the materialisation of pollution (Chapter 6), mostly occurs in newspapers. It has not been identified in the ENV publications and POL speeches, and only one occurrence has been observed in SCI (extract 20 in Chapter 6 was published in 1997 in *Nature*). This scientific occurrence needs to be analysed because its use differs from the use of the scenario in NEW.

> (14)SCI - Conversely, in sediment-rich trenches, the **blanketing** of the trench in several kilometres of sediment will raise oceanic basement temperatures near the toe of the overriding prism by up to 100 °C (ref. 24, for Andean subduction parameters), which would make up for any thermal deficit from reduced shear heating, without important surface slumping so that sediment is carried much farther down the plate interface. *Nature* volume425, pages792–797 (23 October 2003) Cenozoic climate change as a possible cause for the rise of the Andes Simon Lamb & Paul Davis [27]

[27] Extract (14) is an extra occurrence of the scenario discussed in Chapter 6

As we have observed in Chapter 6, the WARMING AS A BLANKET scenario indicates an alteration of temperatures following the metaphorical materialisation of pollution. Extract (14) from SCI illustrates this metaphorical conceptualisation. However, while the NEW extracts discussed in Chapter 6 (extract 18, "increasing these gases raises temperatures, *as if adding a blanket to the duvet*"/ extract 19 "*grilled* under a *blanket* of gases") conceptualise the gas as forming a BLANKET around the Earth, extract (14) from SCI identifies the BLANKET as being formed out of sediments present in the ocean. Yet, this different target domain does not challenge the significance of this scenario in *Nature* (extract 1) because the scientists use it to picture the results of an experiment aiming at observing the warming mechanisms in the oceans. In this extract, the presence of a high amount of sediments in the trench ("sediment-rich trench") is understood through the BLANKET source domain which materialises this amount and illustrates the warming effect of the presence of sediments. This occurrence of the scenario in SCI is thus comparable – to some extent – to its occurrences in NEW: the source concept BLANKET is used by journalists and scientists to materialise the warmth produced by an element (gases or sediments). This materialisation helps metaphor users to explain the warming effect produced by this element over various areas.

Another finding is related to the CRASHING TRANSPORT narrative, part of the perspective of doom predictions (Chapter 7). This narrative has been exclusively identified in newspapers. This is compatible with the alarmist stance in newspapers observed by Foust and Murphy (2009). While scientists, environmentalists, and politicians express their doom prediction through the narrative CLIMATE CHANGE AS A CONFLICT, journalists add another dramatic aspect to the perspective by extending the illustration of doom prediction through the specific metaphorical features of the CRASHING TRANSPORT narrative.

The CLIMATE CHANGE DECISIONS AS A WAR scenario (Chapter 7) is also mostly part of the journalistic genre (175 occurrences; see previous sections). The metaphor only occurs once in SCI articles and POL speeches, and three times in ENV (although this finding can be explained by the different numbers of articles in each genre).

This confirms Atanasova and Koteyko's (2017a) claim about the use of this metaphor in newspapers, such as *The Guardian*, which do not often present a sceptical stance on climate change (this existing finding results from the study of *The Guardian*'s opinion pages). The WAR scenario in newspapers highlights a particular view on climate change decisions from journalists: the comparison of Atanasova and Koteyko's findings (2017a) with the findings from our corpus about the WAR scenario provides clues regarding the prevalence of this particular scenario in this specific genre.

We now focus on the chronological findings, which highlight the evolution of narratives in all genres.

8.7. The chronological evolution of climate change narratives

We now focus on the chronological evolution of narratives in our corpus. This chronological analysis addresses two sub-questions that help us answer RQ (3) about the influence of climatic events on the use of climate change scenarios and narratives: we ask whether an event has been of particular interest and has triggered the use of scenarios in one genre and we ask whether other genres metaphorically describe this event and, if so, whether the same scenarios are used. To discuss our results in an accurate way, we exclusively use the smaller version of our corpus composed of articles published between 2001 and 2017.

8.7.1. Chronology across genres

In this section, we investigate the highest frequencies of each scenario and narrative to study their chronological evolution in different genres. This evolution can highlight a similar focus across genres on particular climatic events described metaphorically. We start our research by analysing the evolution of NEW scenarios. We study the possible link between the chronology in NEW and a particular event. We then look for metaphorical descriptions of this event in the other genres to establish how the use of scenarios describing this event differs. While this section reveals chronological findings which are comparable in different genres, the next section focuses on chronological

findings which are specific to a single genre and cannot be contrasted with the chronological findings in other genres.

We start this chronological research by considering the evolution of one of the most salient narratives in NEW: the NATURE AS A DAMAGED CONTAINER narrative. The extracts from our corpus indicate that these scenarios occur frequently in NEW articles published in 2007 (see Graph 1 p5, Appendix 1). We look for the evolution of this narrative in the other genres to potentially find similar chronological frequencies. Our data show that occurrences of this narrative are also frequent in SCI and ENV articles published in 2006-7 (see Graphs 5 p9 and 9 p13, Appendix 1). The number of articles published in each genre during this year (see tables 6 p191, 15 p210, and 21 p219) cannot explain this frequency because the number of articles published in 2006-7 in each genre is not distinctly high. The frequency of the DAMAGED CONTAINER narrative in the three genres can be linked to the release of the Stern Review, published in October 2006, and the release of the associated report in 2007. The release of this review was a major event because it establishes evidences of the phenomenon and the costs associated with it (Stern 2006). Stern is an economist who has worked for the government and he was the Head of the Government Economic Services when the review was released[28]. His position and his involvement in climate change decisions made this review relevant for the establishment of environmental decisions. The Stern Review explains necessary actions and economical change required to mitigate climate change. The NEW articles published in 2007 show frequent references to this release, as in:

> (15) NEW - The business leaders echoed the findings of last year's **Stern Review** in which the British economist argued that bringing emissions under control now would cost less than one per cent of global GDP annually, whereas "business as usual" would quickly result in **runaway** climate change and an eventual loss of at least one-fifth of the world's GDP. *The Independent* December 1, 2007 Saturday Businessmen back urgent action to halt climate-change emissions BYLINE: Daniel Howden[29]

Extract (15), from *The Independent*, shows that the chronology of the DAMAGED CONTAINER narrative can be explained through journalistic interest in the findings of the Stern Review. Here, the journalist describes business leaders' speech which "echoed"

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28 Biography of Nicholas Stern: https://royalsociety.org/people/nicholas-stern-12343.

29 Extract (15) is an extra occurrence of the scenario discussed in Chapter 5

the content of the review. He distinguishes Stern's advice (from 2006) from the "business as usual" economical trend. He pictures the consequences of this trend through the CLIMATIC DAMAGE AS A LOSS OF CONTENT scenario: if Stern's indications are not followed, climate change would become a RUNAWAY, i.e., a LOST element which humanity cannot control anymore. The journalist emphasises the risks with reference to Stern's economic finding about mitigation ("one per cent of global GDP") which is opposed to the economic consequences of RUNAWAY climate change "at least one-fifth of the world's GDP" (Gross Domestic Product).

SCI and ENV articles do not include such references. We can only infer that the chronology of the DAMAGED CONTAINER narrative in these two genres is related to this event. We can justify the absence of explicit reference in these articles with reference to the specific stance associated with the genres: while newspapers adopt an "event-based tactic" (Trumbo 1996: 274-5), scientific papers focus on scientific findings and experiments, and environmentalist communication deals with the responsibilities for the damages caused by climate change and pollution.

The chronology of the DAMAGED CONTAINER narrative in the four genres indicates that the narrative was salient in articles published in 2008-9 (see Graphs 1 p5, 5 p9, 9 p13, and 13 p16, Appendix 1). This higher frequency can be observed in all genres and cannot be explained by a higher number of articles published during these years (see tables 6 p190, 15 p208, 21 p217, and 27 p228). Our research shows that this frequency can be related to the enactment of the Kyoto Protocol at the international level in 2008. This enactment was still significant in 2009 because this agreement established emission targets for all countries which ratified the Protocol and 2009 was the first year following its enactment. This Protocol was aimed at preventing increase of temperatures by establishing levels of pollution and international emission reduction. Our corpus shows references to the Protocol in NEW articles published in 2009, as in:

> (16) NEW - There is concern that the big energy companies will be pushing **carbon capture and storage (CCS)** as a way of keeping the oil-based economy running. *The Guardian* May 25, 2009 Monday Financial: Climate change summit hijacked by world's biggest polluters, critics claim: Shell could help shape **post-Kyoto agenda** BYLINE: Terry Macalister [30]

[30] Extract (16) is an extra occurrence of the scenario discussed in Chapter 6

Extract (16) shows that the targets established by the Kyoto Protocol in 2008 were still relevant in 2009. The title of the NEW article, "post-Kyoto agenda", indicates that these targets became a comparative ground for the results of climate decisions and the polluting actions of industries (Shell) and polluting countries. Here, the CAPTURE is compared to energy companies' financial interest.

Although the narrative is frequently observed in all genres in 2008-9, newspapers appear to be the only genre which discusses the decisions of the Kyoto Protocol through the DAMAGED CONTAINER narrative. Environmentalists describe these decisions through the CLIMATE CHANGE AS A CRIME AND SOLUTIONS AS JUSTICE scenario in their publications, as in:

> (17) ENV - Friends of the Earth International is running an international petition demanding industrialised countries to turn **climate justice** into reality, asking **new targets** of at least 40 per cent emissions reductions, without offsetting compared to 1990 levels as well as sufficient public finance for adaptation and climate protection in the global south. *Friends of the Earth*, 06 November, 2009 "Rich countries scheme to ditch **Kyoto targets**" [31]

In extract (17), *Friends of the Earth* argue that these targets are not sufficient to provide JUSTICE to non-industrialised countries. They call the governments of industrialised countries to make amend by accepting new targets. *Friends of the Earth* use the CLIMATE CHANGE AS A CONFLICT narrative to describe the targets of the Kyoto Protocol. They emphasise the essential actions required by characterising these actions as providing JUSTICE to non-industrialised countries. We can explain the frequent use in 2008-9 of the DAMAGED CONTAINER narrative in ENV articles by considering the associated descriptions of increasing polluting rates and increasing environmental damages in non-industrialised countries (see Appendix 2 pp. 433-443).

Alternatively, scientists describe the Kyoto Protocol targets through the CLIMATE CHANGE AS A FORCED INTERACTION scenario, as in:

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[31] Extract (17) is an extra occurrence of the scenario discussed in Chapter 7

> (18) SCI - For the lower scenarios, **Kyoto-gas emissions** in the year 2050 are a remarkably good indicator for probabilities of exceeding 2 °C, because for these scenarios (with emissions in 2050 below 30 Gt CO_2 equiv.), **radiative forcing** peaks around 2050 and temperature soon thereafter. "Greenhouse-gas emission targets for limiting global warming to 2 °C" Malte Meinshausen, Nicolai Meinshausen, William Hare, Sarah C. B. Raper, Katja Frieler, Reto Knutti, David J. Frame & Myles R. Allen, *Nature* volume458, pages1158–1162 (30 April 2009) [32]

In this extract, scientists refer to the Kyoto decisions to explain their experiments related to the "scenarios" established by this Protocol (which include the "business as usual" scenario discussed in extract 15). They use the FORCED INTERACTION scenario to picture the future climatic effects of the absence of reduction and targets, scheduled in 2050 according to the Protocol. Scientists use the scenario to promote the decisions established in the Protocol. We can relate the frequency of the occurrences of the DAMAGED CONTAINER narrative in SCI articles published in 2008-9 to the metaphorical descriptions of the effects of ice melting, of CO2 releases, and of deforestation (see Appendix 2 pp.340-353).

In POL speeches, we cannot observe any reference to the Kyoto Protocol. Politicians use the CAPTURE scenario to discuss solutions to climate change.

We now focus on a different narrative which is salient in the metaphorical descriptions of climate change observed in NEW. Our corpus shows that the EARTH AS TRANSFORMED HOUSE narrative was frequently used in 2007 (see Graph 2 p5, Appendix 1). We can compare this finding with the frequency observed in ENV in which the TRANSFORMED HOUSE narrative is frequent in 2006 (see Graph 10 p13, Appendix 1). We can justify these high frequencies in both genres with reference to the release of the fourth IPCC Report which is referred to metaphorically via the TRANSFORMED HOUSE narrative in NEW articles and in ENV communication, as in:

> (19) NEW - The **greenhouse gases**, such as carbon dioxide, whose emissions growth is causing the atmosphere to warm, can be brought under control, said the economists of **the UN's Intergovernmental Panel on Climate Change (IPCC)** - but only if governments act decisively. *The Independent* May 5, 2007 Saturday Climate change can be halted if governments act now, concludes UN BYLINE: Michael McCarthy

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[32] Extract (18) is an extra occurrence of the scenario discussed in Chapter 7

> (20) ENV - **The second volume of the Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change (IPCC)**, Working Group II provides the starkest warning yet on **the threat** of global climate change and predicts the **severe consequences** the planet will face unless world leaders take urgent action to cut emissions of **greenhouse gases**. *Friends of the Earth*, 29 March 2007 Climate change set to overwhelm the world's poor [33]

The release of the report was also a major event for climate change discussions. These IPCC reports present scientific findings about the anthropogenic cause of the phenomenon and possible mitigation[34]. In (19), the journalist refers to the effects of pollution as ADDING DANGEROUS MATERIAL TO THE TRANSFORMED HOUSE: he describes the gas according to its warming consequences. He then links the dangerous characteristics of this ADDITION to the report's findings about the possible "control" over this ADDITION. This link emphasises the significance of the report which is endorsed by the journalist. He establishes the benefits of the solutions by contrasting them with the TRANSFORMED HOUSE narrative, which characterises the danger of climate change. The journalist also refers to the role of governmental policies which are expected to allow the realisation of these solutions. The references to the danger of pollution and to the scientific findings aim at calling the government to act.

In (20), the environmentalists use the EARTH AS A GREENHOUSE scenario to advocate emission reduction. The scenario is used to distinguish this reduction from the effect of inaction: "severe consequences". They describe these consequences to urge "world leaders" to act. Hence, the use of the narrative in the two extracts is grounded in similar interpretations and fulfils similar argumentative function.

Occurrences of the EARTH AS A TRANSFORMED HOUSE narrative have been frequently observed in NEW and SCI articles published in 2009 and 2012-3 (see Graphs 2 p5 and 6 p9, Appendix 1). We can link this frequency in 2009 to the enactment of the Kyoto Protocol, previously discussed, although the SCI extracts do not use the narrative to explicitly describe this event whilst more explicit reference is made in NEW. Scientists rely on this narrative to picture the effect of excessive pollution on the environment.

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[33] Extracts (19) and (20) are extra occurrences of the scenario discussed in Chapter 6

[34] IPCC Reports are available at: https://www.ipcc.ch/

We can justify the frequency in 2012-3 with reference to journalistic discussions of the release of the 5th IPCC report, although the narrative is not used in SCI to describe this report. The reference to the 5th IPCC report in NEW is illustrated in the example below:

> (21) NEW - Carbon dioxide essentially acts like **a giant transparent blanket** that allows sunlight though the atmosphere but then **traps** heat inside - hence the **greenhouse** analogy. (…) **The IPCC** argues that the concentrations of carbon dioxide, methane and nitrous oxide have all exceeded the levels that existed before 1750, before the industrial revolution, by 40 per cent, 150 per cent and 20 per cent. Air trapped in ice cores suggest these gases are at their highest levels in 800,000 years. Some critics argue that the level of warming the world has seen in the past century fails to match the increase in **greenhouse gases**. This suggests that the way the climate warms is highly complex. *telegraph.co.uk* September 27, 2013 Friday "**IPCC report**: Sceptics guide to climate change; As **the fifth major assessment** of the scientific evidence underlying global warming is being published by the UN's Intergovernmental Panel on Climate Change, we examine some of the issues that will be of interest to global warming sceptics". BYLINE: Richard Gray [35]

Extract (21) shows that the journalist describes the scientific findings from this report through the TRANSFORMED HOUSE narrative. Although the stance (in the title of the article) is one of scepticism, this extract is an exemplary use of the scenario by journalists to popularise scientific findings and, in this specific case, highlight the criticism associated with them. In contrast, the SCI extracts produced in 2012-3 use the narrative to describe experiments about the amount of heat and effect on the environment (see Appendix 2 pp.353-373).

The CONFLICT narrative is salient in SCI and ENV publications. We notice a more frequent use of this narrative in articles published in 2007 in NEW and in ENV, and they are also frequently used in SCI in 2006 (see Graphs 3 p5, 7 p7, and 11 p13, Appendix 1). As for NEW, we notice related occurrences of this narrative in extracts discussing the release of the Stern Review, which seems to be a prevalent topic in climate change discussions in newspapers at this time. The CONFLICT narrative in SCI articles from 2006 is frequently used to describe ice melting and environmental disruptions (see Appendix 2 pp. 374-426). In ENV, the narrative is frequently used to describe the 2007

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35 Extract (21) is an extra occurrence of the scenario discussed in Chapter 6

United Nations Conference in Bali, which is also discussed in NEW (to a lesser extent) through a similar scenario. This is illustrated in the examples below:

> (22) NEW - So, whatever the "road map" deal that is agreed, **post-Bali talks** will have to focus on their needs, rather than the concerns of the US and EU, if we are to deliver **climate justice** for all in the years to come. *Morning Star* December 15, 2007 Saturday Time is running out; Bali Diary BYLINE: Tom Sharman

> (23) ENV - Peoples from social organizations and movements from across the globe brought the **fight** for social, ecological and gender **justice** into the negotiating rooms and onto the streets during **the UN climate summit in Bali**. What's missing from the climate talks? **Justice! Climate justice now!** What's missing from the climate talks? **Justice**! *Friends of the Earth*, 14 December 2007 What's missing from the climate talks? Justice![36]

In (22) and (23), the journalist and the environmentalists use the CLIMATE CHANGE SOLUTION AS JUSTICE scenario-version to criticise the decisions taken during the Conference: in (22), the journalist blames the participants of the talk for focusing on industrialised countries which prevents global JUSTICE; in (23), this criticism is characterised as a LACK OF JUSTICE which applies to a range of issues, including environmental issues. Hence, the journalist and the environmentalists use a similar scenario to present similar arguments regarding the talks.

We also observe a higher frequency of occurrences of the CONFLICT narrative in NEW and SCI articles published in 2011 and 2012. Our extracts show that journalists mostly used the narrative to describe the effects of the hurricanes which took place during these years: 2012 was a record period for hurricanes[37]. We can observe the depiction of hurricanes in NEW through the use of the CONFLICT narrative, as in:

> (24) NEW - New York governor Andrew Cuomo and mayor Michael Bloomberg both pointed to climate change as **the culprit for Sandy's ravages** as they addressed the scale of the destruction on Tuesday morning. (…) However, many experts have denied that climate change was behind Hurricane Sandy - Houston Chronicle science reporter Eric Bergen wrote that the connection was 'a stretch that is just not supported by science at this time.' The Intergovernmental Panel on Climate Change has previously said that there is little evidence global warming

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[36] Extracts (22) and (23) are extra occurrences of the scenario discussed in Chapter 7

[37] Report on hurricanes in 2012: nhc.noaa.gov

> worsens tropical storms and hurricanes. *MailOnline* October 31, 2012 Wednesday Will global warming bring storm barriers to New York Harbor? Bloomberg and Cuomo blame **Hurricane Sandy** on climate change[38]

Extract (24) shows that journalists use the CLIMATE CHANGE AS A CONFLICT narrative to explain the cause of the 2012 hurricanes. Hurricane Sandy is described as resulting from climate change. The journalist refers to the New York governor's and the mayor's stance on the event through a personification of the phenomenon: CLIMATE CHANGE AS A CULPRIT. This personification emphasises the danger of climate change because it metaphorically identifies the phenomenon as an entity able to produce hurricanes to destroy the Earth. This identification is, however, questioned in the remainder of the extract through contradictory claims from scientists.

We notice that the occurrences of the CONFLICT narrative in 2011-2 in SCI describe FORCED INTERACTIONS between different resources (e.g., gas, atmosphere, oceans, and ice) which result in a range of climatic effects (e.g., melting, temperature increase). These SCI extracts illustrate scientific hypotheses and experiments to explain the phenomenon (see Appendix 2, pp. 374-426).

We can also observe a high frequency of occurrences of the CONFLICT narrative in NEW, SCI, and ENV in articles published in 2015-6. Our corpus shows that journalists and environmentalists frequently relied on the narrative to report on Pope Francis' speech on climate change. These references can be observed in the examples below:

> (25) NEW- On climate change, Hispanic Catholics hear **pope's** message - and it's personal; Long before **Pope Francis** called for the faithful to work toward **environmental justice**, water and drought were natural concerns for many in the western US and willing disciples may galvanize like never before. *The Guardian* June 27, 2015 Saturday BYLINE: Suzanne Goldenberg

> (26) ENV - "Those who owe the **biggest ecological debt**, industrialised countries, must now act with urgency and ambition. Dirty corporations that have long **abused our planet** have driven us to the brink of environmental and social catastrophe. **Pope Francis' words today** meet the surge in popular demand for urgent, ambitious and equitable action to address the climate crisis." (Lucy Cadena, Friends of the Earth) Pope says climate crisis is a **matter of justice** – reaction 18 June 2015 (my addition in parenthesis)[39]

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38 Extract (24) is an extra occurrence of the scenario discussed in Chapter 7

39 Extracts (25) and (26) are extra occurrences of the scenario discussed in Chapter 7

Extract (25) from *The Guardian* displays an occurrence of the CLIMATE CHANGE SOLUTION AS JUSTICE scenario-version to describe the 2015 Pope's speech. The associated metaphorical expression was part of this speech and it attracted journalists' attention. Here, the journalist relates the content of the speech triggering Hispanic responses to past climatic events in the western US. This comparison enables her to picture climate change through its global effects and to criticise the delay of such responses following the speech: affected populations have long been concerned by the issue, but they have not attracted a similar CALL FOR JUSTICE.

We can explain the high frequency of occurrences of the CLIMATE CHANGE AS A CONFLICT narrative in NEW in 2015-16 by considering the higher number of NEW articles published during this period (see Table 11). Events such as the Paris Agreement (see section 8.9.2) and climate change-related speeches have triggered a higher number of publications about climate change in newspapers.

In (26), the environmentalist endorses the Pope's message and justifies his stance through the CLIMATE CHANGE AS A DEBT scenario-version. She blames industrialised countries for "abus[ing] our planet". This blame is established as a DEBT although Lucy Cadena does not name the communities to whom the DEBT is owed (possibly, non-industrialised countries). She describes the REPAYMENT OF THE DEBT in terms of environmental actions: "now act with urgency and ambition". This REPAYMENT echoes the Pope's speech quoted in the remainder of the extract which is re-interpreted by the environmentalist.

Hence, while the journalist adopts a more critical stance on the Pope's message regarding its delay, the environmentalist endorses the message and uses the scenario to emphasise related arguments.

The use of the CLIMATE CHANGE AS A CONFLICT narrative in SCI during this period is not explicitly related to particular events: scientists discuss different ranges of environmental disruptions which do not display any common pattern regarding the year they all occurred in (see Appendix 2, pp.374-426).

The UNAFFECTED ENVIRONMENT AS GREEN scenario is the most salient scenario in POL. This scenario appears frequently in POL speeches and NEW articles from 2007 (see Graphs 4 p5 and Table A13 p15, Appendix 1). POL speeches rely on this scenario to present a positive picture of Britain's future (which is contemplated through the promotion of particular *green* policies), the occurrences of the scenario in POL are thus not associated with synchronous climatic events. Instead, this scenario is used to describe a fictitious British environment promoted by the politicians' decisions. The NEW occurrences show frequent journalistic discussions of political stances about the environment. Journalists discuss Al Gore's movie, *An Inconvenient Truth*, which was released in September 2006, and describe the stance of the former US vice President via this scenario. We also observe journalistic use of the scenario to discuss British politicians' speeches on the environment, as in:

> (27) NEW - The key difference between Mr Brown and Mr Blair's concept of our role in the world could be the idea of Britain as an exemplar. Mr Blair has always resisted the idea that the British people should risk putting themselves at a short-term disadvantage for a long-term higher purpose. He mocks the idea that any politician facing re-election would act to prevent people from flying; yet Mr Brown has just doubled airport tax, which should cut British flights by 4 per cent. Mr Miliband, the Secretary of State for the Environment, has advocated the idea that this country should set **a green example** to the world. *The Independent on Sunday* June 10, 2007 We need leaders fit for a climate of change[40]

Extract (27) is an exemplary use of the UNAFFECTED ENVIRONMENT AS GREEN scenario in NEW. The journalist compares different political stances on the environment. This description involves the former UK Prime Minister's, Tony Blair, "resistance" to environmental policies ("Mr Blair has always resisted the idea that the British people should risk putting themselves at a short-term disadvantage for a long-term higher purpose"). This stance is distinguished from the stance adopted by Gordon Brown, the successor of Tony Blair, who decided to double the airport tax to decrease the number of flights. The comparison ends with Ed Miliband's viewpoint which the journalist

[40] Extract (27) is an extra occurrence of the scenario discussed in Chapter 4

summarises by "this country should set a *green* example to the world". Hence, the journalist uses the scenario to picture an evolution of political interest and stance on the environment.

The ideological stance associated with the GREEN scenario (see Chapter 4) in NEW is linked to journalists' political discussions. This scenario has also been frequently used in NEW and POL discourses from 2009. The NEW extracts from 2009 show frequent references to Prince Charles' speech during the Copenhagen Climate Change Conference (see Appendix 2, pp.17-30). This finding confirms that the UNAFFECTED ENVIRONMENT AS GREEN scenario in NEW frequently describes political stance on climate change. The scenario in POL displays different stances on the UK's future and justifies political decisions which are presented as leading to a GREEN future. When the idea of GREENNESS is questioned by politicians, the extracts show frequent references to previous political stances which the metaphor users adapt to confirm or criticise (see Appendix 2, p.475-477).

In the following section, we look at the genre-specific chronological evolution of narratives. We link higher frequencies of scenarios and climatic events occurring during the periods of publication.

8.7.2. Genre-specific chronology

We now discuss the genre-specific focus on particular climatic events which have, according to the results from our corpus, influenced higher frequencies of scenarios in a particular genre. While in the previous section, we observed similar chronological evolution of narratives in different genres, this section focuses on the evolution of narratives specific to each genre: the chronological findings related to a narrative in a specific genre may not be comparable to the chronological findings related to the same narrative in other genres. In this section, we do not discuss the frequencies of the political scenarios because the limited number of occurrences of each scenario in the speeches does not allow us to draw conclusions about genre-specific focus.

We start our discussion by considering the chronological evolution of NEW narratives. The frequencies help us to identify a particular journalistic interest in Donald

Trump's decision to withdraw from the Paris Agreement which involves the establishment of international emission targets and which has been preceded by the Kyoto Protocol. We notice higher frequencies of deterioration and materialisation scenarios in NEW articles published in 2015-7 (see Table 11 and Appendix 1, Graphs 1 and 2 p5). The related extracts from our corpus show frequent references to the US political decision described through these scenarios, as in:

> (28) NEW - Salt Lake is **warming at twice the rate** seen in other parts of the country, and is running out of water. The city's water is **the lifeblood** for over a million residents in the area. *The Independent* June 18, 2017 Sunday US states to fight climate change after **Donald Trump pulls out of Paris agreement** BYLINE: CLARK MINDOCK

> (29) NEW - So far the world's average temperature has risen by just under one degree because of **greenhouse gas** emissions from human activity. *The Independent* May 31, 2017 Wednesday **Donald Trump to withdraw US from Paris Agreement on climate change**, sources say; The departure of the world's second **biggest source of greenhouse gases** from the international accord designed to reduce them would be **a major blow** BYLINE: Ian Johnston, Mythili Sampathkumar [41]

Extract (28) shows that the NATURE AS A DAMAGED BODY narrative has been used in newspapers to emphasise the severity of the environmental records established in 2016. The journalist draws a link between these records and the consequences of the US withdrawal. The LIFEBLOOD scenario highlights the VITAL characteristics of disappearing natural resource (i.e., water) following climate change (caused by high pollution rates). This description criticises Donald Trump's decision (in the title of the article) and emphasises its consequence for the environment.

Extract (29) shows that the EARTH AS A GREENHOUSE scenario draws a link between the evolution of climate change ("the world's average temperature has risen") and the evolution of human pollution ("from human activity"). The title of the article shows that such a link is effective in criticising the US withdrawal ("a major blow") from the Paris agreement which aims at establishing international targets for emission reduction.

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[41] Extracts (28) and (29) are extra occurrences of the scenarios discussed in Chapters 5 and 6

The chronological findings and the events described in NEW extracts show that the Paris Agreement and Donald Trump's decision have influenced journalists' interest in the topic of climate change (higher number of NEW articles published in 2015-7, see Table 11). This journalistic interest has triggered the higher frequency of climate change narratives in newspapers.

The chronological findings in *Nature* show that the CLIMATE CHANGE AS A CONFLICT narrative was salient in SCI articles published in 2011 (see Graph 7 p9, Appendix 1). Our extracts demonstrate that scientists focused on the impact of gas emissions, which they expressed through the FORCED INTERACTION scenario, as in:

> (30) SCI - It is also noteworthy that other **anthropogenic climate forcings** had a much stronger impact on the global temperature — Jones *et al*. find a three to four times greater warming by **greenhouse** gases. "Global warming: The soot factor" Johannes Quaas *Nature* volume471, pages456–457 (24 March 2011) [42]

Extract (30) shows that the FORCED INTERACTION scenario in SCI articles establishes a relation between temperature increase and human activities ("anthropogenic"). We can explain the frequency in SCI in 2011 by considering the record of temperature increase calculated during this year, associated with a record amount of CO2 in the atmosphere[43]. However, the scientific stance focuses on hypotheses, experiments, and findings, and prevents the identification of an explicit link between yearly events and scientific use of scenarios. The relation between environmental records and the SCI scenario in extract (30) has to be moderated because of the absence of reference in this genre.

The CLIMATE CHANGE AS A CONFLICT narrative is also frequently used in SCI publications from 2002-4. The related extracts describe experiments and hypotheses about the cause and effect of temperature increase (see Appendix 2 pp.374-426). Although no explicit reference to a climatic event has been noticed in these extracts, we can infer that this frequency could be related to the 2003 heatwave. This event has triggered scientific attention because scientists have published a report about the risk of

[42] Extract (30) is an extra occurrence of the scenario discussed in Chapter 7

heatwave[44] to foresee future damages. However, the link between the 2003 heatwave and the frequency of the SCI scenario remains speculative regarding the absence of reference in our corpus.

In *Friends of the Earth*'s publications, we notice that a number of scenarios describe the 2015 Paris Agreement. Indeed, the ENV extracts from our corpus show that environmentalists frequently used the CLIMATIC DAMAGE AS A LOSS OF CONTENT and CLIMATE CHANGE AS A LACK OF JUSTICE scenarios in 2015 publications, as in:

> (31) ENV - "Emission cut pledges made by rich countries so far are less than half of what we need to avoid **runaway** climate change. The draft **Paris agreement** on the negotiating table this week shows that many seem ready to accept irreversible and devastating consequences for people and the planet," said Susann Scherbarth, climate justice and energy campaigner at Friends of the Earth Europe. *Friends of the Earth*, 19 October 2015 "Rich countries put planet on course for irreversible climate change"

> (32) ENV - Florent Compain, President of Friends of the Earth France, said: "President Hollande stated that he wants an ambitious and equitable **climate agreement**. But how can France lead if it cannot reign in its polluters? Companies like Engie and EDF, in which the French state is a shareholder, still refuse to close their 46 dirty coal plants. This must change urgently, we need **climate justice** now." *Friends of the Earth*, 30 November 2015 "**Paris Summit**: Reaction to Heads of States" [45]

In (31), environmentalists use the CLIMATIC DAMAGE AS A LOSS OF CONTENT scenario (see Chapter 5) to discuss the decisions taken in the Paris Agreement. *Friends of the Earth* identify the RUNAWAY characteristics of climate change as a consequence of the decisions taken ("many seem ready to accept irreversible and devastating consequences"). The environmentalists use the scenario to criticise the politicians' stance: they claim that politicians are unaware of the danger of RUNAWAY climate change which leads them to take inappropriate decisions.

Extract (32) shows that *Friends of the Earth* discuss the Paris Agreement through the CONFLICT narrative. They use the CLIMATE CHANGE SOLUTION AS JUSTICE scenario-version to inform their readership about their disbelief regarding the future

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[44] Scientific report on the risk of future heatwaves following the 2003 heatwave: https://www.newscientist.com/article/dn4259-the-2003-european-heatwave-caused-35000-deaths/

[45] Extracts (31) and (32) are extra occurrences of the scenarios discussed in Chapters 5 and 7

effects of these decisions. They blame the former French President François Hollande for his stance on the decisions which he depicted as "ambitious and equitable". The environmentalists distinguish François Hollande's viewpoint from the multiplication of polluting industries ("46 dirty coal plants") in France. They describe these two facts via the JUSTICE scenario-version which highlights that the agreement, in view of the situation of industries, is an INJUSTICE. This distinction promotes the environmentalists' call for CLIMATE JUSTICE.

The genre-specific chronological findings demonstrate that journalists and environmentalists frequently communicated about the same topic, the Paris Agreement. However, they relied on different narratives to describe such an event: journalists described this Agreement via the NATURE AS A DAMAGED BODY and the EARTH AS A TRANSFORMED HOUSE narratives while environmentalists used the NATURE AS A DAMAGED CONTAINER and CLIMATE CHANGE AS A CONFLICT narratives. This difference may be explained with reference to journalists' and environmentalists' different viewpoints on the event: journalists focused on the US withdrawal from the agreement while environmentalists used scenarios to criticise the decisions taken in the Paris agreement.

Scientists' use of the CLIMATE CHANGE AS A FORCED INTERACTION scenario shows a scientific interest in record increases of temperatures and record increases of emissions. These findings show that scientists frequently use scenarios to illustrate the causal relation between climatic events and emissions. In contrast, journalists and environmentalists frequently use scenarios to discuss decisions about climate change.

In the following chapter, we discuss the different uses of climate change narratives and scenarios in newspapers, scientific papers, environmentalist publications, and political speeches. We discuss the identification of salient scenarios in each genre and we provide details about less frequent scenarios in different genres. We then discuss the chronological evolution of narratives in the four genres.

Chapter 9: Discussion

9.1. Introduction

In this chapter, we discuss the scope of the results observed through the qualitative analysis of the metaphor scenarios and narratives in newspapers, international scientific journals, environmentalist publications, and political speeches about climate change. We also discuss the findings from the distribution patterns of narratives and scenarios in our corpus.

This discussion highlights how these results respond to the aims and scopes of this present research and how they reveal gaps in existing literature about climate change metaphors.

9.2. The varying use of scenarios and narratives in the four genres

Our study complements existing findings about climate change metaphors which demonstrate the popularisation of the topic, the conventionalisation of some metaphors, and the influence of environmental events on metaphorical use (Nerlich 2010; Schaffer & Schlichting 2014; Atanasova & Koteyko 2017a; Van der Hel, Hellsten & Steen 2018). Our analysis offers an additional view which focuses on how the metaphorical features that are transferred (or not) to another context influence the descriptions of climate change. Our study shows that a single metaphorical expression can present different meanings depending on the context (because of editorial decisions in newspapers, for example). The particularities of the topic of climate change drew our attention towards the argumentative use of metaphors. Indeed, climate change is a scientific topic which has a global impact on humanity. For this reason, different discourse communities – such as journalists, scientists, environmentalists, and politicians – are involved in the communication of this topic, addressed to different audiences. Each of these discourse communities has particular interest and particular communicative goals. Their different interests in particular characteristics of climate change (the pleasant environmental conditions of the pre-industrial era, effects of pollution, environmental policies, climatic evolution), their different opinions on climate change (e.g., scepticism), and their different readership/audiences were conceived as possible factors which could influence the metaphorical production. We thus analysed the different uses of similar metaphorical expressions in four main genres: newspaper articles, international scientific journals, publications from Non-Governmental Organisations, and political speeches. The varying use of metaphorical expressions in these four genres showed that these expressions were

interpreted according to particular arguments regarding climate change. We thus identified metaphor scenarios and narratives in our corpus to observe the role of metaphors in the evaluation of climate change performed by particular metaphor users.

9.2.1. The use of scenarios and narratives in newspapers

Our focus on climate change metaphors in newspapers is justified by the function of this particular genre which has been established as a "filter of information" (Nerlich & Koteyko 2010: 38). Journalistic metaphors are used to promote the newsworthiness of the topic discussed and the population's interest (Charteris-Black 2004: 115). The metaphors in newspapers may respond to the readership's competence to understand the metaphorical meaning. Steen (1994) finds that the occurrence of non-journalistic metaphors (e.g., "literary metaphor") in newspapers is often explicitly signalled by journalists to emphasise the external origin of such metaphors (1994:72). Our analysis showed that the metaphorical occurrences in newspapers were linked to existing discourses, for example journalistic descriptions of scientific findings or political agreements. However, this link is sometimes questionable when the references to previous discourses in newspapers are not explicitly mentioned (e.g., general references to "scientists", "eco-doommongers"). Additionally, the extracts analysed in Chapters 4, 5, 6, and 7 show that journalists can explicitly quote a metaphorical expression produced by a specific metaphor user (e.g., politician) in order to ridicule his or her stance on climate change.

Following the results of our analysis of newspaper articles about climate change, we noticed that journalists rely on the NATURE AS A DAMAGED CONTAINER narrative to inform their readership about the origin of pollution (i.e., the CONTENT) and emphasise the consequences of the population's lifestyle and reliance on polluting sectors (i.e., causing the LOSS OF THE CONTENT) on the environment. Journalists can describe the LOSS as the cause of climate change: it leads to the DAMAGE of natural elements (e.g., the atmosphere, the earth, the climate). Journalists favour the CLIMATIC DAMAGE AS A LOSS OF CONTENT scenario as part of the narrative because these metaphorical descriptions draw a link between the global aspect of the phenomenon and more delimited/local aspects related to it. For example, the scenario in newspapers relates

the pollution produced in a specific area to the wider consequences on the climate. These metaphorical features have probably promoted the frequent reliance from journalists on this scenario since it helps to establish a relationship between climate change and individual lifestyle.

The DAMAGED CONTAINER narrative has been contrasted with the NATURE AS A DAMAGED BODY narrative which is also related to the perspective of deterioration of nature (Chapter 5). These two narratives present a new insight into the metaphor source domains discussed in Chapter 5. For instance, Semino, Deignan & Littlemore (2013) discuss the role of the POISON scenario within the SICK BODY narrative in Italian political discourses. They highlight the ideological function of the source domains through the analysis of political descriptions of the opposing Party as an ADDICTION to which the metaphor user proposes a VACCINE (2013: 48-9). These metaphors have been re-contextualised in an online forum where metaphor users mention EXCESSIVE DOSES OF VACCINE leading to POISONING (2013: 51). This source domain in climate change discourse has been adjusted to fit specific arguments. In Chapter 5, POISON describes the role played by carbon according to modern viewpoints on pollution which may lead sceptical metaphor users to criticise modern stances on carbon. The POISON is cited as an antipode of LIFEBLOOD, which argues that the mapping CARBON AS A POISON is absurd.

Our discussion of the *ozone hole* metaphor in the BODY-related (WOUND) and CONTAINER-related (DAMAGED ZONE) narratives is reminiscent of Semino's findings (2011) which associate the target domain PAIN MECHANISMS with the source domain OPENING/CLOSING GATE (i.e., OPENED GATE causes the experience of pain and CLOSED GATE does not cause the experience of pain). From a more general perspective, this association highlights the conceptualisation of the BODY AS A CONTAINER. In our corpus, this conceptualisation can "entail" the metaphor THE EARTH AS A BODY-CONTAINER.

The DAMAGED CONTAINER narrative shows that the movement outside the CONTAINER can be described through two main metaphorical verbs: *escape* and *release*. The *release* metaphor has been discussed by Deignan, Semino & Paul (2019) who identify it as one of the most frequent metaphors in their corpus composed of secondary student talks about climate change (2019:394; see below). Their interpretation

in terms of "a previously enclosed substance (…) being allowed to move" (2019: 394) corresponds to the association we have established between the deterioration of nature and the DAMAGED CONTAINER. In our corpus, we have identified differences of interpretation depending on the verb used to depict this process (i.e., *escape* or *release*), which have not been discussed in existing literature. For instance, the deliberate aspect of the RELEASE has been used by *Friends of the Earth* to criticise particular decisions leading to the damages on the environment. The ESCAPE scenario-version pictures the climatic damages as resulting from a lack of attention.

Deignan, Semino, and Paul (2019) investigate the frequencies of climate change metaphors in three genres: academic papers, textbooks, and students talks. They show how the use of metaphors in the two latter genres can differ from the use in the academic corpus. To reach this result, the linguists have built three corpora: the academic corpus composed of articles published between 2001-2010 in three scientific journals (*Climate Change*, *Global Environmental Change*, and *Nature*; 250,753 tokens), the corpus of materials composed of popular and educational texts published between 2005-2015 (textbooks, revision guides, teacher packs, educational and popular science websites; 206,976 tokens), and the corpus of interviews of school students aged 11-16 (87,929 tokens; 2019: 386). They notice the prevalence of the *release* metaphor in educational science materials: *release* is the eighth most frequent metaphor out of the ten most frequent metaphors used in this corpus (182 occurrences; 2019: 389; 394). They note that interviewed students also frequently rely on the *release* metaphor to discuss climate change (89 occurrences in the interviews; fourth most frequent metaphor out of ten; 2019: 390; 394). However, the metaphor does not occur in their academic corpus (2019: 391). Additionally, the interviewed students have been reported to use the metaphor in the same way the metaphor is used in educational texts, as opposed to other metaphors, such as *greenhouse effect*, whose meaning has been simplified by the students (2019: 395; see below). The existing findings about the link between the *release* metaphor and educational texts and the relevance of the scenario in our corpus leads us to assume that journalists give prevalence to metaphors which have an educational impact to discuss climate change. Indeed, the unambiguous interpretation of the scenario – as reported by Deignan, Semino, and Paul (2019) – may have promoted its frequent use in the newspaper articles which compose our corpus. Journalists favour scenarios whose metaphorical

features can be acknowledged by a wider readership (e.g., such as young students). However, our findings contradict existing claims about the absence of the metaphorical expression *release* in an academic genre: the scientific articles selected from the journal *Nature* also present a relatively frequent use of the associated scenario (LOSS OF CONTENT) which is contrasted, in this genre, with the possibility of CAPTURING THE CONTENT. Other scenarios may present specific features related to scientific findings (e.g., the *greenhouse effect* metaphor) and may therefore not be adapted to the understanding or interest of the newspaper readership.

In comparison, the frequency of the EARTH AS A TRANSFORMED HOUSE narrative in newspapers shows that such a narrative is salient in this genre to metaphorically describe climate change. Our findings highlight that the EARTH AS A GREENHOUSE scenario presents features which seem to be mostly acknowledged by the scientific community (Deignan, Semino, & Paul's academic corpus, 2019). The POLLUTION AS A TRAP scenario in newspapers highlights some of the features comprised in the meaning of the *greenhouse effect* metaphor which has become a "technical term" in climate change discourse (Deignan, Semino & Paul 2019: 389-90). The features at play in the use of the *greenhouse effect* metaphor may not be as noticeable as they were when the metaphor was still "novel". This metaphorical expression is effective in highlighting the warm and surrounding features shared by the gases and the GREENHOUSE concept. Journalists emphasise the relevant features of the metaphor in newspaper articles through the collocations of additional metaphorical expressions such as *trap* or *lock*. The disadvantageous effect of the TRAPPING has been analysed in political and media discourses about Brexit: the EU/ UK (depending on the stance) are characterised as an "unjust entrapment" to share a feeling of "Harm, Cheating, (…) and Oppression" (Charteris Black 2019: 174). This adaptation to a politically contested topic confirms the alarmism derived from the use of the scenario in climate change discourse (i.e., lack of freedom caused by politics/ pollution). POLLUTION AS A TRAP relies on the idea of imprisonment, as it has been analysed in discourses about Brexit (Charteris Black 2019: 311-2). Journalists may adapt the EARTH AS A GREENHOUSE scenario because their knowledge of the topic differs from scientists'. The newspaper readership may not find specific features sufficiently relevant or understandable. Additionally, journalists may extend the meaning of the metaphor *greenhouse effect* to trigger readership's attention

(Charteris Black 2011: 9; 32; 2014: 96) through more alarmist metaphorical expressions such as WAR-related expressions (Romaine 1996).

We have also discussed the less frequent scenarios and narratives in newspaper articles about climate change. We have demonstrated that the eulogistic view on (unaffected) nature and the doom prediction about the evolution of climate change are not prevalent aspects of climate change discussed in this genre. We can explain this limited reliance by considering the "event-based" focus of newspapers (Trumbo 1996: 274-5; Weingart, Engels, & Pansegrau 2000: 263; Brown, Budd, Bell, & Rendell 2010: 663). These two metaphorical perspectives are associated with ideological points of view on the topic and with uncertainty about the evolution of climate (as we have illustrated through the UNAFFECTED ENVIRONMENT AS GREEN and the CLIMATE CHANGE DECISIONS AS A WAR scenarios). Hence, they do not answer the journalistic requirement to communicate about climate change-related events. The deterioration and materialisation perspectives can both fulfil this function since they describe the effects of pollution. They can also establish a link between particular events and particular human activities, illustrated in section 8.7. These findings do not resonate with existing literature which establishes the prevalent use of WAR and RELIGION scenarios in the media discussing climate change (Atanasova & Koteyko 2017a; Nerlich 2010). However, our research shows that in contrast with other genres, these scenarios are most likely to occur in newspapers although their use remains relatively less frequent in this genre compared to other, more salient, scenarios such as CLIMATIC DAMAGES AS A LOSS OF CONTENT, EARTH AS A GREENHOUSE, and POLLUTION AS A TRAP.

9.2.2. The use of scenarios and narratives in scientific papers

We also focused on research articles published in *Nature*. This type of literature is aimed at a more limited readership (compared to the newspaper readership) whose scientific knowledge and interest is assumed by the metaphor users (most readers are part of the scientific community). Our focus on scientific research papers about climate change involves expectations regarding the readership's interest in the topic. Unlike the newspaper's readership, readers of scientific articles are interested in climate change as a

main topic while the newspapers readership may focus on climate change-related events among other topics. Metaphors are an integral part of scientific thought, as suggested by several studies (e.g., Gentner & Jeziorski 1993:447; see below). Scientific metaphors have been reported to differ from other literary metaphors (Gentner 1982), although this claim has been questioned in other studies (Steen 1994: 162). They can establish new meanings by relying on novel mappings of domains. These mappings fulfil an explanatory function within scientific texts (Boyd 1993: 482; Lakoff 1993: 244; Cacciari 1998: 139). Schön (1993:139-41) provides an example of the particularities of scientific metaphors through the PAINTBRUSH AS PUMP analogy which allows scientists to picture the particularities of the PAINTBRUSH in terms of a PUMP (1993:140). Another, more popular, example of scientific metaphors relies on the mapping between the planet MARS and the colour RED which involves mythological background related to Mars as the god of war and the association between war and bloodshed which are linked to the violent energy and activity on the planet Mars (Gentner & Jeziorski 1993: 470).

In our research, "novel" mappings of domains have indeed been identified in the articles from *Nature*. In particular, the nominal use of *forcing* – which is part of the metaphorical expression *climate forcing* – reveals that scientists have adapted the lexicon to produce metaphorical expressions which correspond to their observations and to the results of their experiments. The risk of ambiguous interpretation is a major concern for scientists because the interpretation would question the validity of their findings. Therefore, scientific articles can favour "literal and transparent" language (Knudsen 2015: 191-2). In our corpus, however, we observed that *climate forcing* was described as a more accurate observation of the causes and possible effects of climate change, compared to the use of the non-metaphorical expressions "climate change" or "global warming" to describe these causes and effects in other genres. This finding resonates with existing research which discuss problematic and ideological transformation of scientific discourse: Weingart, Engels, and Pansegrau (2000) show the problems of adaptation of the expression "climate catastrophe" which was originally used by scientists, and which has been adapted across media to convey alarmist perspectives on climate change. This popularisation of the expression revealed an alarmist understanding of the issue, which was not expected by scientists who have adjusted their claims following existing uncertainty. Hellsten (2002) shows how the meaning of scientific metaphors can be

debated and questioned when used in a plurality of discourses (scientific papers, educational science texts, and news media). She shows that this questioning can give rise to opposing arguments about the scientific topic. In our research, we showed that the metaphorical expression *climate forcing* was prevalent in the scientific genre. However, its use remains minimal in the other genres which seem to continue to describe the phenomenon through the expressions "climate change" or "global warming" although these expressions seem less accurate considering the metaphorical prevalence in *Nature*.

The metaphorical expression *climate forcing* has been interpreted as part of the scenario CLIMATE CHANGE AS A FORCED INTERACTION. Such a scenario has revealed a prevalent narrative in scientific papers which conceptualises CLIMATE CHANGE AS A CONFLICT. We can interpret the low frequency of use of other CONFLICT scenarios – such as CLIMATE CHANGE AS A CRIME and CLIMATE CHANGE DECISIONS AS A WAR – in *Nature* in relation to the lexical requirements of scientific discourse (Knudsen 2015). These scenarios present emotional features related to the precarious evolution of climate change. This emotional viewpoint contradicts the objective report on scientific experiments and findings. Similarly, we have also established that eulogistic scenarios constitute a very limited perspective in scientific papers. This perspective mostly occurs through the scenario HUMANITY/NATURE AS A FAMILY, but the related frequencies indicate a negligible relevance in scientific articles about climate change. The scientific stance is expected to show a degree of objectivity (Knudsen 2015) and a reliance on such eulogistic scenarios may lead metaphor recipients to question the validity of the scientific experiments.

The scientific articles from our corpus mostly describe climate change through the doom prediction perspective. We have demonstrated that scientists discuss their doom prediction in terms of a FORCED INTERACTION. This scenario illustrates the impact of pollution on the evolution of climate change and relies on the RESPONSE/ FEEDBACK scenario-version to describe findings or documented assumptions about climate's REACTION to the FORCING. Through this scenario, scientists can highlight the partial certainty associated with the topic: while the occurrence of the FORCING is not questioned by scientists, the subsequent RESPONSE/FEEDBACK comprises uncertain characteristics regarding the places in which it will occur, the time by which it will occur, and to which extent it will affect the population.

We have also demonstrated that the perspectives of the materialisation of pollution and the deterioration of nature have been more sporadically observed in scientific articles. Scientists mostly describe pollution in terms of a TRANSFORMATION OF THE EARTH INTO A MAN-MADE GREENHOUSE. According to this description of the GREENHOUSE, humans are identified as the BUILDERS OF THE TRANSFORMED HOUSE, which leads to particular arguments asking metaphor recipients to DESTROY THE HOUSE. This interpretation adds a new insight into Romaine's (1996) and Nerlich & Hellsten's (2014) discussions of the *greenhouse effect* metaphor. Particularly, Romaine (1996) interprets the metaphor in relation to humans as the INHABITANTS of the earth (i.e., conceptualisation of HUMANS AS PLANTS and EARTH AS A HOME, 1996:181) but does not discuss the depiction of HUMANS AS THE BUILDERS OF THE HOME. This latter conceptualisation helps metaphor users to highlight humans' responsibility for climatic events and emphasises the "+human" feature involved in the source concept GREENHOUSE.

We also demonstrated that scientists describe the deterioration of nature as a LOSS and CAPTURE OF CONTENT. They do not only focus on the deterioration caused by pollution, they also emphasise the existence of particular solutions which are then tested through various scientific experiments. Therefore, scientists perceive climatic damages as being caused by human activities and emphasise that these damages can be solved by humans' decisions to adopt a sustainable lifestyle.

9.2.3. The use of scenarios and narratives in publications from Friends of the Earth

The use of metaphors in science is more hazardous when scientific discourse is adapted to other discourses, such as public or political discourses. A scientific metaphor may be adapted in other discourses with no mention of the original scientific context which helps to specify its figurative meaning (Knudsen 2015: 195). Climate change metaphors in science are likely to be used in public discourses since the topic is relevant to all communities of discourse. In existing literature, climate change metaphors in the mass media have been analysed and their origin has been situated in scientific communication (Väliverronen & Hellsten 2002; Koteyko, Thelwall & Nerlich 2009; Lakoff 2010;

Nerlich, Koteyko, & Brown 2010; Schafer & Schlichting 2014). For example, Väliverronen and Hellsten (2002) show that the *ozone hole* metaphor emerged from scientific public communication as a consequence of scientific acknowledgement that ozone depletion could not be observed without specific machinery (2002: 229). The linguists note that journalists promote the use of such familiar concepts to deal with scientific issues (2002:230). Journalists also adapt theory-constitutive metaphors: the presentation of the environment as a *library of life* is a journalistic elaboration of the *book of life* metaphor about genetics, used in the press to call for environmental policies (Väliverronen & Hellsten 2002). Koteyko, Thelwall, and Nerlich (2009) notice the use of *carbon* compounds in the first IPCC assessment report in 1990 to draw a link between consumption and climate (2009:29-31). These compounds have then been adapted in the mass media and in online discourse about climate change mitigation (2009: 26).

However, our study demonstrates that the scientific impact on the use of climate change metaphors can be questioned. Indeed, the communication from NGOs is often discarded in existing literature. For instance, Nerlich and Hellsten (2014) use the *Web of Science* database to investigate the first use of the metaphor *carbon footprint* in scientific papers and news headlines produced between 1900 and 2013. They identify the first occurrences in *Web of Science* indexed articles in 2006 and in newspaper headlines in 2005 (2014: 28-9). In contrast, our analysis of climate change narratives and scenarios in four genres shows that the metaphorical expression *carbon footprint* was coined by environmentalists prior its documented use in scientific papers. Our corpus shows that the source domain FOOTPRINT has been observed in environmentalist communication published in 2003. This leads us to infer that the conceptualisation of POLLUTION AS FOOTPRINT(S) arises from environmentalist discourse. Overall, our discussion of the POLLUTION AS FOOTPRINT(S) scenario contributes to the analysis of climate change metaphors because existing literature mainly focuses on *footprint* as part of a *carbon*-compound and does not provide specific finding about the source domain FOOTPRINT and its various features in climate change discourse (e.g., Koteyko, Thelwall & Nerlich 2009; Koteyko 2010; Nerlich & Koteyko 2010).

The existing literature duscussing the use of climate change metaphors in publications from NGOs focuses on the environmentalist stance on climate change. Doyle (2007) highlights the function of NGO discourse about climate change as an adaptation

of scientific communication aimed at a wider readership. This adaptation fulfils a more ideological role compared to scientific papers because environmentalists are expected to raise the population's awareness and to favour the enactment of particular environmental decisions. For example, Doyle (2007: 6) studies *Greenpeace*'s reader guide for the first IPCC report in 1990 whose function is to promote a better understanding of the scientific stance. She also highlights a focus on the urgency to solve the issue through alarmist metaphorical occurrences such as visual metaphors representing CLIMATE CHANGE AS A TIME BOMB (2007: 8-10). Environmentalists can also use (visual) metaphors to respond to particular political decisions (e.g., Bush' policy on the use of oil; see Doyle 2007: 15).

In our research, similar alarmist metaphors have been observed in the publications from *Friends of the Earth*. For instance, our study shows that while scientists describe climate change predictions in terms of a FORCED INTERACTION (*climate forcing*), environmentalists emphasise the danger related to climatic evolution through the use of a more dramatic scenario: CLIMATE CHANGE AS A CRIME. This metaphorical conceptualisation of climate change has not been discussed in existing literature. However, the competing scenario associated with the CONFLICT narrative, CLIMATE CHANGE DECISIONS AS A WAR, has been given greater attention. The use of the source domain WAR in climate change communication has been analysed in existing literature (Romaine 1996; Olausson 2009; Nay & Brunson 2013; Shaw & Nerlich 2015; Atanasova & Koteyko 2017a; Flusberg, Matlock & Thibodeau 2017; Koteyko & Atanasova 2017). Atanasova and Koteyko's (2017a: 453-4) findings on the use of the CLIMATE CHANGE AS A WAR metaphor in the press opinion pages have been confirmed in our analysis: on the one hand, the WAR scenario helps metaphor users to picture different communities as being part of the same CAMP (2017a: 457-9) and, on the other hand, the scenario can be part of sceptical argumentation criticising the alarmist claims from environmentalists (2017a: 464-5).

The particularities of the scenario CLIMATE CHANGE AS A CRIME, which prevails in environmentalist communication, help metaphor users to put the blame on particular polluters, polluting sectors, or non-environmentally-friendly governmental decisions. We can explain this reliance on the scenario CLIMATE CHANGE AS A CRIME by the documented function of environmentalist discourse which is aimed at

adapting scientific discourse (Doyle 2007). Indeed, the narrative CLIMATE CHANGE AS A CONFLICT (which comprises the scenarios CLIMATE CHANGE AS A CRIME and CLIMATE CHANGE AS A FORCED INTERACTION) is also prevalent in scientific articles. However, the amount of environmentalist publications in our corpus does not allow us to draw any general conclusion about this potential link with scientific communication.

We noticed the absence of the FORCED INTERACTION scenario and the limited occurrences of the WAR scenario in environmentalist publications. This absence or limited use can be explained by focusing on the particular features of each metaphorical concept. While the CRIME scenario focuses on the need for JUSTICE, the WAR scenario involves an opposition between humanity, pollution, and Nature, which contradicts the role of environmentalists who identify themselves as "friends" of the Earth, i.e. the general effects of and responsibilities for the WAR can contradict the environmentalists' arguments. The FORCED INTERACTION scenario highlights existing uncertainty regarding climate prediction. This uncertainty may downplay the environmentalists' arguments about the necessity to solve the issue.

We have established that the environmentalists also rely on the materialisation perspective. They describe pollution as forming a DIRTY/DANGEROUS GREENHOUSE. This focus has been illustrated through occurrences from our corpus in which the environmentalists emphasise the damaging effect of the high amount of pollution produced by specific countries or sectors. The use of deterioration scenarios show that environmentalists focus on the LOSS OF CONTENT which is perceived as the cause of the environmental damages (the perspective is also relatively frequent in this genre).

We noticed that environmentalists use the scenarios EARTH AS A GREENHOUSE and CLIMATIC DAMAGES AS LOSS OF CONTENT in their publications to emphasise the danger of anthropogenic climate change which favours the enactment of appropriate environmental decisions. This interpretation is coherent with Doyle's findings (2007) about the alarmism conveyed by the use of metaphors in environmentalist discourse: environmentalists identify humans as the BUILDERS of the DANGEROUS HOUSE and the subsequent call to DESTROY THE DANGEROUS

HOUSE appears as a necessary action to sustain human life. Similarly, the causal relationship established through the use of the LOSS OF CONTENT scenario between industrial pollution and global environmental damages draw recipients' attention towards the necessity to reduce emissions to prevent further damages.

We have also discussed the limited use of eulogistic narratives in environmentalist publications. Where such narratives are observed in this genre, we noticed a focus on the idea of GREENNESS to question the environmental features of particular decisions. We can explain the sporadic use of eulogistic narratives via the environmentalists' focus on the consequences of polluting activities. Their discourse is action-oriented (Doyle 2007) which means that they do not favour ideological scenarios such as UNAFFECTED ENVIRONMENT AS GREEN. This can also explain the frequencies of materialisation and deterioration scenarios: while materialisation scenarios focus on the effect of pollution, the deterioration scenarios focus on the cause of emissions. Hence, environmentalists favour the CRIME-related scenario to picture the effect of human activities on the evolution of climate change.

9.2.4. The use of scenarios and narratives in political speeches

The use of metaphors in political discourse has been documented in existing literature. Political metaphors have often been studied through the scope of their persuasive impact on the population (Lakoff 2004; Musolff 2004; 2006; 2016a; 2019; Charteris-Black 2006; 2011; 2014; 2019; Fløttum 2013). Some studies analyse politicians' use of metaphors to describe climate change. These studies show that politicians rely on scientific discourse to communicate about the topic: for example, while media discourse uses the expression "global warming", scientists and politicians identify the topic through the expression "climate change" (Weingart, Engels, & Pansegrau 2000; Whitmarsh 2009; see section 9.2.2.). However, this reliance on scientific reports can also produce ideological issues when the political stance favours scepticism. Such issues have been illustrated by Scollon (2008: 138-9) who discusses the government's modification of scientific reports through the addition of markers of uncertainty (see Chapter 3, section 3.2. Piltz' report). Ly (2013) shows that members of the European Parliament try to avoid the complexity of the topic

of climate change and favour the use of familiar terms (2013: 152). She identifies the JOURNEY and WAR metaphors in political debates which are both used to unify the population by picturing climate change as a MUTUAL ENEMY, and by picturing a DISTANCE THAT HAS BEEN COVERED and an opposition between the WRONG and the RIGHT TRACKS (2013: 158-61; 163-4).

Ly's study (2013) resonates with our observation of political metaphors in our corpus. Indeed, while other genres describe the danger associated with climate change, we noticed that politicians favour metaphorical descriptions of environmental solutions (e.g., "carbon *capture*"). We have demonstrated that, while the use of the perspective of the deterioration of nature is limited in the political speeches from our corpus, politicians describe this deterioration in terms of a CONTENT that needs to be CAPTURED. By contrast, journalists and environmentalists describe this deterioration through a focus on the CONTENT that is LOST. This illustrates a political focus on the solutions which can be adopted to mitigate climate change, while other genres focus on the damaging effects of the phenomenon.

Additionally, these solutions are perceived through a eulogistic perspective which promotes the depiction of future Britain as a "green and pleasant land", which has recovered its pleasant natural resources. Shaw and Nerlich (2015) state that different political stances lead to different depictions of climate policies. Politicians can either picture energy policies as a *painless* transition or as *aggressive* cuts (2015: 39). However, these different metaphorical stances have not been observed in the political speeches which compose our corpus. We acknowledge that the selection of a larger amount of political speeches could have provided additional metaphorical views which could correspond to Shaw and Nerlich's (2015) observations. In our present research, we noticed that Labour, Conservative, and Liberal Democrat politicians all rely on pleasant images of the environment to promote their environmental policies. These similar images of the environment can be observed in the similar use of the adjective *green* which collocates with positively-oriented adjectives to reveal similar metaphorical collocations in speeches from different political parties. These similar metaphorical collocations of *green* may be surprising if we consider the opposing stances on climate change mitigation performed by opposing political parties.

Our analysis of political scenarios and narratives about climate change shows the prevalence of the eulogistic perspective on unaffected nature. The restricted amount of speeches does not allow us to draw particular conclusions regarding the significance of the scenarios and narratives in this genre. The frequency of the UNAFFECTED ENVIRONMENT AS GREEN scenario may be explained in terms of a pleasant description of nature which is aimed at justifying particular policies or ideologies. While the deterioration, materialisation, and doom prediction perspectives focus on the cause, effect, and precarious evolution of climate change, the eulogy of nature helps politicians to convince metaphor recipients about the benefits of environmental policies, and about their political concerns for the environment.

In the following sections, we summarise our findings about the salient scenarios and narratives in each genre. We then establish the chronological evolution of narratives in all genres.

9.3. Findings from the distribution of scenarios and narratives in the four genres

The distribution of scenarios in the four genres highlights particular viewpoints on climate change. The relevance of deterioration and materialisation scenarios in newspapers cannot be contrasted with the relevance in scientific and environmentalist publications, and in political speeches. Yet, these scenarios are still moderately exploited in these three genres, which provides enough ground to contrast the use of the related scenarios in each genre. Journalists may assume that the deterioration and materialisation scenarios are more appropriate to fit their readership's interest. This prevalence indicates an "event-based" focus in newspapers (Trumbo 1996: 274-5). The various editorial stances favour the questioning of the interpretation of the scenarios. To describe pollution as a material entity, journalists often rely on the EARTH AS A GREENHOUSE and POLLUTION AS A TRAP scenarios, while the salient scientific and environmentalist uses of this perspective are limited to the EARTH AS A GREENHOUSE scenario (MAN-MADE DANGEROUS/DIRTY MATERIAL OF THE TRANSFORMED HOUSE). The relevance of two scenarios in newspapers has been explained by the "theory-constitutive" nature of the *greenhouse effect* metaphor (Boyd 1993; Nerlich & Hellsten 2014; Deignan, Semino, & Paul 2019): journalists can make the metaphorical meaning more explicit to

their readership by relying on different metaphorical expressions to avoid repetition (justified by the regularity of publications pertaining to the genre). The TRAP scenario emphasises the dangerous features of the target which leads to more dramatic pictures of the topic.

The NATURE AS A DAMAGED CONTAINER narrative is favoured in all genres to depict the deterioration of nature. While journalists' and environmentalists' descriptions mainly rely on the scenario CLIMATIC DAMAGE AS A LOSS OF CONTENT, scientists also adopt the CLIMATE CHANGE SOLUTION AS A CAPTURE OF CONTENT scenario to discuss solutions to prevent the deterioration. Politicians exclusively use the latter scenario to advertise environmental protection and promote *green* policies.

The salience of the narrative CLIMATE CHANGE AS A CONFLICT in scientific and environmentalist publications does not seem to prevail in the journalistic use of metaphors. We can infer that these scenarios are more appropriate to the scientific and environmentalist readership. However, we notice various versions of the narrative in the different genres: journalists frequently use the CLIMATE CHANGE DECISIONS AS A WAR scenario to describe their prediction, scientists favour the CLIMATE CHANGE AS A FORCED INTERACTION scenario, and environmentalists depict climate change evolution as a CRIME (and we observed one occurrence of the WAR scenario in the political speeches from our corpus). These differences highlight a gradation in terms of the dramatic features associated with each source domain: journalists favour a more dramatic stance through a global view on the dangerous future effects of climate change, environmentalists rely on dramatic features whose causes and effects are more delimited (WAR vs CRIME), and scientists question the validity of these future effects (uncertain RESPONSE).

The use of the eulogistic perspective is limited in most of the genres (i.e., newspapers, scientific and environmentalist publications). This result indicates that the related scenarios can only be observed in a limited number of occurrences and none of these three genres favour such a metaphorical depiction of climate change. By contrast, political speeches show a prevalent use of UNAFFECTED ENVIRONMENT AS GREEN scenario to discuss climate change. The GREEN scenario is also frequently used

by journalists and environmentalists in descriptions and arguments about the possibility of recovering the pleasant characteristics of unaffected nature. This scenario helps politicians to promote an optimistic view on climate change, which is expected to be solved following the enactment of the politicians' *green* decisions.

We provide more details about the salience of scenarios and narratives in the four genres in the following section which contrasts these findings with the chronological evolution observed in Chapter 8.

9.4. The interrelation between scenarios in newspapers, scientific, environmentalist, and political discourses

In this chapter, we have discussed the use of different scenarios about climate change in four genres. This investigation helps us to identify the narratives on which metaphor users typically rely to communicate about climate change in different genres.

In Chapter 8, we have demonstrated that newspapers present a majority of scenarios related to the perspectives on deterioration of nature and materialisation of pollution. The metaphorical occurrences in the extracts specify the relevance of particular scenarios. Our study of the deterioration scenarios shows that journalists frequently use the NATURE AS A DAMAGED CONTAINER narrative and more specifically, the scenario which pictures CLIMATIC DAMAGE AS A LOSS OF CONTENT. Although the other genres do not display a similar focus, we can note that environmentalists also favour this scenario when they describe the deterioration of nature (see section 8.4.).

Our chronological analysis highlights that the DAMAGED CONTAINER narrative has been frequently observed in newspaper articles published in 2006-7, 2009, and 2015-2017 (see Graph 1 p5, Appendix 1). We have noticed that the frequency in 2009 is related to the enactment of the Kyoto Protocol. This event has promoted the use of scenarios in most of the genres but the metaphorical interpretation differs: journalists describe the Protocol through the LOSS/CAPTURE OF CONTENT scenario, environmentalists rely on the CLIMATE CHANGE SOLUTION AS JUSTICE scenario-version, and scientists use the CLIMATE CHANGE AS A FORCED INTERACTION

scenario to discuss the agreement. Hence, the chronology shows that this event has influenced different metaphorical descriptions in these genres.

Despite the similar chronological frequencies of the DAMAGED CONTAINER narrative in 2006-7 in newspapers, and in scientific and environmentalist publications (see Graph 1 p5, 5 p9 and 9 p13, Appendix 1), we have established a specific journalistic focus on the release of the Stern Review which has not been metaphorically described in other genres.

We have also observed higher frequencies related to the use of this narrative in newspaper articles published in 2015-7, in environmentalist communication produced in 2014-5, and in scientific papers released in 2012-3. We have associated this chronological evolution with the focus in newspapers and environmentalist publications on the Paris Agreement, with varying stances on this event and different scenarios (i.e., journalists describe the US withdrawal and environmentalists describe emission targets).

Chapter 8 demonstrates the relevance of materialisation scenarios in newspapers. Our research shows that journalists describe pollution through particular scenarios. Extracts from newspapers frequently rely on THE EARTH AS A GREENHOUSE and the POLLUTION AS A TRAP scenarios. The relevance of this particular perspective on climate change seems to be specific to newspapers. In contrast, the materialisation perspective is moderate in scientific and environmentalist articles. Scientific and environmentalist depictions of pollution mainly rely on THE EARTH AS A GREENHOUSE scenario. The metaphorical interpretation is specific to the stance adopted in each genre: journalists emphasise the dangerous features associated with the GREENHOUSE through metaphorical expressions which convey a worrisome picture of its TRAPPING capacity; environmentalists also emphasise the danger of pollution through descriptions of the DANGEROUS MATERIAL OF THE TRANSFORMED HOUSE; scientists focus on the cause of this TRANSFORMATION: humankind.

The chronological findings about the use of the EARTH AS A TRANSFORMED HOUSE narrative can explain the prevalence of this narrative in different genres over particular periods. We have frequently observed the narrative in newspaper articles published in 2006-7 (see Graph 2 p5, Appendix 1). Environmentalist articles published between 2005 and 2007 also frequently rely on this narrative (see Graph 10 p13,

Appendix 1). Scientists frequently use the narrative in articles published in 2004 and 2006 (see Graph 6 p9, Appendix 1). We have established a link between these similar chronological frequencies and a similar focus on the release of the fourth IPCC report. Hence, like the Kyoto Protocol and the Paris Agreement, the fourth IPCC report can also be considered as a major event which has influenced the use of scenarios and narratives in our corpus.

The perspective of doom prediction is the most salient in scientific and environmentalist discourses. By contrast, newspapers seldom rely on this perspective to describe climate change. The perspective of doom prediction in newspapers frequently pictures CLIMATE CHANGE DECISIONS AS A WAR. We can identify the most salient aspect of the CONFLICT narrative in environmentalist articles through the CLIMATE CHANGE AS A CRIME scenario. This prevalence differs in scientific articles which mostly rely on the scenario CLIMATE CHANGE AS A FORCED INTERACTION to describe doom predictions. This finding shows that journalistic interpretation of the CLIMATE CHANGE AS A CONFLICT narrative differs from the interpretations in environmentalist and scientific discourses. Journalists favour a scenario that conveys dramatic features to the doom prediction, these features are downplayed by *Friends of the Earth* who focus on the RESOLUTION OF THE CRIME. Scientists do not rely on such features: their doom prediction focuses on a FORCED INTERACTION which may result in different RESPONSES. In Chapter 7, we have demonstrated that the FORCED INTERACTION scenario describes the uncertainty about Nature's RESPONSE while the INTERACTION is occurring. Hence, scientists focus on the uncertainty about the evolution of climate change, which is demonstrated by the features of the most salient scenario in the scientific articles that compose our corpus. In contrast, journalists and environmentalists do not share the same focus. The WAR and CRIME source domains emphasise the dramatic aspects of future damages caused by climate change and the dramatic and "legal" aspects of their resolution.

Our chronological analysis indicates that the CONFLICT narrative has been frequently observed in newspaper articles published in 2007 (see Graph 3 p5, Appendix 1). We can relate this frequency to the prevalent use of this narrative in environmentalist publications in 2007 and in scientific publications in 2006 (see Graph 7 p9 and 11 p13, Appendix 1). While scientists do not associate the scenarios with particular events, we

have noticed that newspapers and environmentalist articles display similar metaphorical descriptions of the Bali Conference on Climate Change. Journalists and environmentalists rely on the scenario to criticise the decisions taken during this conference. However, in our corpus, journalists use this scenario more frequently to discuss the release of the Stern Review. Hence, we cannot infer that the conference was a major event that triggered the use of metaphors in different genres.

The CONFLICT narrative has also been frequently observed in newspaper articles published in 2012. We have explained this frequency through journalistic descriptions of hurricanes. We can contrast this frequency with the use of related scenarios in scientific articles published in 2011 but these scientific articles do not explicitly mention hurricanes. Therefore, we cannot infer that the hurricanes triggered particular metaphorical use in different genres.

Additionally, the three genres (newspapers, scientific and environmentalist publications) show frequent occurrences of the CONFLICT narrative in 2015-16 articles: high frequencies have been observed in newspaper articles published during these two years, these scenarios are frequent in scientific articles published in 2016, and environmentalist articles frequently display occurrences of these scenarios in 2015. While the scientific stance does not promote the reference to particular events, we noted that journalists and environmentalists use the scenario to describe the Pope's speech about climate change. The similar chronological frequencies in newspapers and environmentalist publications establish this event as a factor promoting the use of the CONFLICT narrative to describe climate change.

The eulogistic perspective on nature represents a limited use of climate change scenarios. Indeed, eulogistic scenarios have been very scarcely observed in newspapers, scientific and environmentalist publications. In contrast, politicians mainly rely on this perspective to discuss climate change. To convey a eulogistic picture of nature, journalists, environmentalists, and politicians mostly rely on the UNAFFECTED ENVIRONMENT AS GREEN scenario while scientists rely on the scenario HUMANITY/NATURE AS A FAMILY to highlight a relationship between different natural resources and the consequences of climate change on all of these resources.

The chronological evolution of the UNAFFECTED ENVIRONMENT AS GREEN scenario shows higher frequencies in newspaper articles published in 2007 (see Graph 4 p5, Appendix 1). This frequency cannot be related to the metaphorical occurrences in scientific and environmentalist articles (see Graphs 8 p9 and 12 p13, Appendix 1). Politicians rely on this scenario more frequently in 2006-7 than in other years (see Table A13 p15, Appendix 1). The semantic association between the idea of GREENNESS and journalistic reports on political decisions can explain the chronological similarity in newspapers and political speeches about climate change.

We have demonstrated that the most salient scenarios in newspapers (i.e., NATURE AS A DAMAGED CONTAINER and EARTH AS A TRANSFORMED HOUSE) share several features with environmentalist discourse. These similarities have been observed through the use of comparable scenario-versions and comparable chronological evolution of narratives and scenarios in these two genres.

Additionally, our results show that the environmentalists' use of climate change narratives can be contrasted with scientific metaphorical descriptions, i.e. comparable use of the DAMAGED CONTAINER and TRANSFORMED HOUSE narratives and comparable chronological frequencies. Hence, our chronological findings and our focus on the use of metaphorical expressions in different genres highlight similarities not only in the use of deterioration and materialisation narratives in newspapers and environmentalist publications, but also in the use of these narratives in scientific papers and environmentalist publications.

The distribution patterns show that journalists do not often discuss climate predictions while this perspective is the most salient in scientific and environmentalist articles. Our research demonstrates that the use of doom prediction scenarios in newspapers is chronologically related to the use of these scenarios in scientific and environmentalist discourses.

On the one hand, the prevailing scenarios associated with climate predictions present climate change through dramatic features in newspapers and environmentalist publications: both genres favour a conceptualisation of climate change as a WAR or a CRIME. On the other hand, the chronological results show that scientific metaphorical descriptions of climate predictions – which present less dramatic features – frequently

occurred during a period when journalists and environmentalists also frequently used these metaphor scenarios. Even though the prevailing scenarios differ in each genre, the evolution of narratives demonstrates a chronological interrelation.

Our research demonstrates that the metaphorical descriptions of climate change in newspapers shares many features with the metaphorical descriptions observed in environmentalist discourse: similar chronology, similar focus on climate change events, similar metaphorical descriptions. Additional research would be required to investigate the validity of our findings about the use of scientific metaphors in newspapers and environmentalist communication (with a specific focus on scientific metaphorical descriptions).

Chapter 10: Conclusion

10.1. Introduction

In this research, we have identified and discussed the various metaphor narratives and scenarios which occur in climate change communication. We have also established how they are adapted to present arguments and counterarguments or to question metaphorical features displayed in particular discourse. These steps have helped us to demonstrate that metaphors can be variably adapted depending on the genre they are used in, the period during which they are produced, and the authorial stance towards, or understanding about a particular concept. The reliance on frequency has permitted a distinction between the salient narratives and scenarios occurring in each genre. This distinction has provided a picture of the evolution of narratives and it has attributed salient scenarios to particular genres. We have also linked several metaphorical occurrences to highlight prevailing narratives which emphasise the images the metaphor users rely on to discuss particular aspects of climate change. These narratives constitute relevant settings through which climate change can be described in the four genres. Additionally, the identification of perspectives reveals the particular characteristics of the topic of climate change which trigger metaphorical descriptions in our corpus (e.g., pollution, environmental decisions, and environmental damages). In the following sections, we answer our three main research questions:

RQ1: Which metaphorical narratives and scenarios are used in journalistic, scientific, environmental and political discourse about climate change?

RQ2: What is the distribution of these metaphorical narratives and scenarios across the four genres?

RQ3: To what extent, if at all, has the production/adaptation of these metaphorical narratives and scenarios been influenced by climate change-related events?

In this chapter, we explain and elaborate the relevance of our findings to emphasise the significance of this research. We also acknowledge existing limitations related to our methodology and to the scope of our results. Finally, we focus on the additional steps that may be undertaken to extend this research.

10.2. The adaptation of metaphorical meaning: findings from the qualitative analysis

We start our discussion of findings by considering the qualitative results, related to RQ(1). The findings establishing different ranges of adaptations of scenarios and narratives show that the metaphor users rely on similar metaphorical expressions and, in some cases, similar narratives to discuss climate change. However, they can produce different scenarios which highlight genre-specific and subjective adaptation of meaning. The adjustments of metaphorical meaning observed in Chapters 4, 5, 6, and 7 show that the metaphorical concepts associated with climate change can be questioned or extended through the particular features of the domains at play.

In Chapter 4, we have seen that the positively oriented qualities displayed by the UNAFFECTED ENVIRONMENT AS GREEN scenario have been debated in some articles of our corpus. The NURTURING behaviour of MOTHER EARTH/NATURE has sometimes transformed into a STRICT behaviour from the MOTHER which contradicts Lakoff's (2004) gender-related assumptions about the characteristics he attributes to the NURTURING PARENT and the STRICT FATHER. The CLIMATE CHANGE AS A RELIGION narrative gives rise to several occurrences of metaphor scenarios fulfilling sceptical arguments. This confirms Nerlich's (2010) and Atanasova & Koteyko's (2017a) findings about the sceptical use of these metaphors which we can compare with the positive features conveyed by the metaphorical references to THE GARDEN OF EDEN, which emphasise the need for climate actions.

In Chapter 5, the NATURE AS A DAMAGED BODY narrative relies on the VITAL functions of specific ORGANS (i.e., resources) and specific MEDICAL EQUIPMENT (i.e., human activities and climate actions). The particular features of the target domain have favoured the occurrence of particular source domains (e.g., the LUNGS) because the ground of the mapping effectively pictures climatic deterioration (the dangerous effect of gas). In some cases, these scenarios characterise the effect of climate change as an exaggeration from environmentalists or scientists: the VITAL functions of environmental resources are questioned and the LETHAL consequences of emissions are debated.

From a different stance, metaphor users can describe climate change through the NATURE AS A DAMAGED CONTAINER narrative. The HOLE formed as a result of this deterioration is depicted as detrimental for humanity because it leads to the LOSS OF CONTENT. Depending on the stance of metaphor users, this LOSS is identified as an ESCAPE or a RELEASE which is either irreversible because of the damages it causes or manageable because of existing solutions. This narrative represents a significant aspect of climate change communication in our corpus. Associated scenarios have been observed in each of the four genres with a limited adaptation of meaning (particularly in the case of the scenario SOLUTION AS CAPTURE/SEQUESTRATION).

In Chapter 6, we have discussed the scenarios and narratives which are used to materialise pollution. The EARTH AS A TRANSFORMED HOUSE narrative gives rise to a plurality of different scenarios in our corpus. This narrative recalls Romaine's (1996) research which interprets the EARTH AS A GREENHOUSE metaphor in terms of the conceptual mappings EARTH AS A HOME and HUMANS AS PLANTS. However, the adaptation in our corpus places particular emphasis on HUMANS AS THE BUILDERS/ DESTROYERS OF THE HOUSE. Some metaphor users extend the scenario to picture a TRANSFORMED HOUSE BUILT OUT OF DIRTY/DANGEROUS MATERIAL. In different cases, the WARM and CLOSED features of the TRANSFORMED HOUSE are emphasised via different scenarios such as THE EARTH AS A HEATED CONTAINER and POLLUTION AS A TRAP. The narrative POLLUTION AS A DANGEROUS TRACE also materialises pollution and this finding echoes Nerlich and Hellsten's (2014) results about the use of the metaphor in science and in the media to quantify pollution (2014:28). In our corpus, we have identified a plurality of scenario-versions related to the STEPS LEAVING THE FOOTPRINTS, THE DIRTY/DANGEROUS COMPONENT OF THE FOOTPRINT, and the SIZE(S) OF THE FOOTPRINT(S).

In Chapter 7, we have identified different scenarios and narratives which refer to doom predictions. The (FUTURE) CLIMATE CHANGE AS A CRASHING TRANSPORT narrative is observed through various metaphorical descriptions highlighting the different features of the source domains: the features of a TRAIN, a BOAT, or a PLANE are highlighted to produce dramatic views on future climate change. The occurrences focus on the characteristics of the JOURNEY/ DESTINATIONS and on humans' ability to avoid a CRASH. The CLIMATE CHANGE AS A CONFLICT

narrative has displayed salient use of scenarios. These scenarios all question Nature's place in the CONFLICT. Some metaphor users (mainly, scientists) favour the picture of a FORCED INTERACTION, while others turn it into a WAR (mainly, journalists and politicians). Alternatively, the CONFLICT can result in a CRIME that needs to be resolved with JUSTICE (mainly, environmentalists).

Overall, our study of metaphor narratives and scenarios in the four genres has shown that the metaphor users all discuss climate change according to particular perspectives on the topic: climate change is characterised through the alteration of the pre-industrial environment, the environmental damages it causes, the effect of excessive pollution, and the evolution of climatic changes. In the following section, we describe the distribution patterns related to these scenarios and narratives in the four genres.

10.3. The distribution patterns of scenarios and narratives in the four genres

In Chapter 8, we presented the distribution patterns in the four genres in order to identify prevalent narratives and scenarios in each genre. The distribution patterns demonstrate that metaphorical concepts are discussed through different features depending on the genre and period, which we now discuss in more details with reference to RQ(2) and RQ(3).

We showed that each perspective – eulogy of nature, deterioration of nature, materialisation of pollution, and doom prediction – comprises various narratives with a prevalence, in most of the genres, of particular ones (i.e., the DAMAGED CONTAINER, the TRANSFORMED HOUSE, and the CONFLICT narratives).

The frequencies of use have distinguished salient narratives and scenarios from less frequent ones in the four genres. The journalistic, scientific, environmentalist, and political genres have been analysed to observe how each discourse is likely to metaphorically describe the topic. The salient metaphorical descriptions we have observed in each of these four genres have then been contrasted.

Our study of newspaper articles (NEW) has highlighted the prevalence of two perspectives on climate change: the deterioration of nature and the materialisation of

pollution. The descriptions of deterioration of nature frequently rely on the scenario CLIMATIC DAMAGE AS A LOSS OF DANGEROUS ELEMENTS (i.e., gases). The scenario also prevails in scientific and environmentalist related descriptions. Contrarily, the political speeches exclusively rely on an alternative scenario: CLIMATE CHANGE SOLUTION AS A CAPTURE/ SEQUESTRATION.

The metaphorical descriptions of the materialisation of pollution show that all genres favour the EARTH AS A TRANSFORMED HOUSE narrative. However, while journalists focus on the depiction of the EARTH AS A GREENHOUSE and POLLUTION AS A TRAP, scientists more frequently emphasise the MAN-MADE TRANSFORMATION OF THE HOUSE, and environmentalists frequently describe the DIRTY/DANGEROUS MATERIAL OF THE TRANSFORMED HOUSE (while politicians seldom rely on this perspective). These differences have been explained by considering the "theory-constitutive" aspect of the *greenhouse effect* metaphor in climate change discourse (Boyd 1993; Nerlich & Hellsten 2014; Deignan, Semino, & Paul 2019). In our corpus, journalists have highlighted particular features of the concept GREENHOUSE to favour a more dramatic understanding. They present a more dramatic stance on the effect of pollution. While journalists focus on the effect of the TRANSFORMATION, the distribution and use of the TRANSFORMED HOUSE narrative in our corpus show that scientists and environmentalists focus on the cause of this TRANSFORMATION: emissions and human activities.

We have noticed that the perspective of doom prediction is the most salient in scientific and environmentalist publications (mostly expressed through the scenarios CLIMATE CHANGE AS A FORCED INTERACTION and CLIMATE CHANGE AS A CRIME, respectively). Journalists rely less frequently on this perspective. Where this perspective is observed in newspapers, journalists describe these predictions through frequent reliance on the CLIMATE CHANGE DECISIONS AS A WAR scenario. This reliance corroborates our preceding findings about the dramatic stance of journalistic metaphors and about the similarities between journalistic and environmentalist metaphorical descriptions, i.e. journalists and environmentalists frequently conceptualise predictions through dramatic features related to the source domains WAR and CRIME while scientists rely on more moderate features involved in the source domain INTERACTION.

Journalists mostly rely on the UNAFFECTED ENVIRONMENT AS GREEN scenario to present a eulogistic picture of (unaffected) nature. This conceptualisation is salient in the political speeches we have investigated, and environmentalists also mostly rely on this scenario when relying on this perspective. The occurrences in our corpus highlight a semantic relation between the idea of GREENNESS and political decisions.

We showed that the salient scenarios and narratives in each genre involve features which are related to the specific stance of the genres: journalists favour scenarios which display features that help metaphor recipients to understand climatic events; scientists use scenarios whose features illustrate uncertainty and promote the objectivity of their findings; environmentalists endorse scenarios whose features promote actions and mitigation; and politicians mainly rely on scenarios whose features help them to advertise the benefits of particular environmental policies.

We noticed that some scenarios have exclusively been observed in newspapers (e.g., CRASHING TRANSPORT). However, these scenarios are not prevalent in this genre, as demonstrated in Chapter 8. Journalists favour scenarios and narratives which are more typically used in all genres under study (e.g., EARTH AS A TRANSFORMED HOUSE and NATURE AS A DAMAGED CONTAINER). The CLIMATE CHANGE DECISIONS AS A WAR scenario is an exception: it does not prevail in scientific, environmentalist, and political discourses but in cases where the perspective of doom prediction has been observed in newspapers, this scenario is the most salient in journalistic descriptions of doom predictions. We can explain this particular prevalence in newspapers by considering the ubiquity of the source domain in British discourses (Charteris Black 2019: 105; 138) and the semantic relation between the source domains WAR and CRIME: the CRIME scenario which is comprised in the perspective of doom prediction is the most salient in environmentalist discourse. Hence, this sematic relationship between the source domains of these two prevalent scenarios in newspapers and in environmentalist publications highlights a comparable metaphorical view on the evolution of climate change in these two genres.

Additionally, journalists, scientists, environmentalists, and politicians do not favour narratives depicting a geographically limited scope on climate change. The NATURE AS A DAMAGED BODY narrative focuses on particular resources, and the

POLLUTION AS A DANGEROUS TRACE narrative depicts individual or national management of emissions (with some occurrences describing international management). Both of these narratives do not prevail in any of the genres under study. In contrast, the NATURE AS A DAMAGED CONTAINER and the EARTH AS A TRANSFORMED HOUSE narratives emphasise the global effect of climate change, and these two narratives prevail in all genres. Hence, in our corpus, climate change is metaphorically described as a global phenomenon and is seldom viewed through its effects on particular regions.

With reference to RQ(3), which deals with the chronological evolution of narratives in our corpus, we notice that the evolution of the narratives NATURE AS A DAMAGED CONTAINER and EARTH AS A TRANSFORMED HOUSE is analogous in newspapers and in environmentalist communication. The chronological findings for the narrative CLIMATE CHANGE AS A CONFLICT show that journalists, environmentalists, and scientists most frequently used this narrative during the same periods. Such chronological findings reveal that climatic events trigger the use of particular narratives and scenarios.

Chapter 8 has presented an influence of political events (i.e., the Kyoto Protocol/ the Paris Agreement) and of scientific reports (i.e., IPCC reports/ Stern Review) on the use of narratives in newspapers and in environmentalist communication (and, to lesser extent, in scientific papers). Our chronological findings show that the significance of such events can give rise to varying scenario versions and stances in different genres: for example, in metaphorical descriptions of the 2015 Paris Agreement, we showed that newspapers focus on the US withdrawal from the Paris Agreement while environmentalist publications focus on the insufficient targets established in the Paris Agreement. We established the prevalence of particular climate change-related events through the analysis of metaphorical occurrences from newspapers and environmentalist communication, but this could not be established in the scientific and political genres, given the partial evidence related to the higher frequency of use during particular periods.

These findings help us to identify the similar and different metaphorical descriptions of climate change in the four genres. Firstly, the identification of similar narratives and scenarios highlights corresponding conceptualisations of climate change

in all genres: climate change is identified though similar perspectives which emphasise specific aspects of the topic (alteration of the pre-industrial environment, deterioration of nature, excessive pollution, and predictions about future climate). Secondly, we have noticed a similar focus in scientific and environmentalist publications on doom prediction about climate change. This focus is more limited in newspapers and it is minimal in political speeches. Thirdly, despite the different views on the topic, our findings show that similar narratives prevail within each perspective in all genres: NATURE AS A DAMAGED CONTAINER, EARTH AS A TRANSFORMED HOUSE, and CLIMATE CHANGE AS A CONFLICT. These prevailing narratives emphasise particular viewpoints on climate change which is thereby depicted as a global phenomenon. We have shown that the associated scenarios can be questioned in our corpus which reveal a plurality of different adaptations in all genres. Fourthly, the chronological evolution of narratives and their distribution patterns in each genre have established salient metaphorical descriptions of climate change. The prevalent scenarios (e.g., CLIMATIC DAMAGE AS A LOSS OF CONTENT) and the association between scenarios and particular events in our corpus have revealed similarities between metaphorical descriptions of climate change in newspapers and environmentalist descriptions. The similar chronological evolution of narratives, the metaphorical descriptions of particular climatic events, and the related metaphorical uses provide ground for the identification of similar descriptions of climate change in newspapers and in environmentalist publications. The observation of similar metaphorical use in the scientific texts can only be partially determined: the high frequency of use of a scenario over a particular period in *Nature* often precedes the high frequency of use of the same scenario in newspapers and in *Friends of the Earth* publications during the same period. However, we have demonstrated that the salient scenarios in scientific papers differ from the scenarios used in the other genres. The scientific stance prevents us from establishing particular links between scenarios and climatic events, although these links have been highlighted in newspapers and environmentalist discourse.

In the following section, we establish our main contributions to existing literature on metaphors and on climate change communication.

10.4. Main Contributions

Our research contributes to existing literature about metaphor analysis and climate change communication. Firstly, we supplemented existing methodology for the identification of metaphors with the reliance on an electronic corpus whose results have helped us to identify and interpret metaphors in a large corpus. Secondly, we have shown that scientific metaphors cannot be attributed an "accurate" meaning (Deignan, Semino, & Paul 2019): the metaphorical meaning is continuously adapted following different focuses on the topic, different periods of publications, different stances, and the evolution of scientific findings. Our results demonstrate relevant adaptation of metaphorical meanings which have not been analysed yet (e.g., features of the source domain FOOTPRINT, the relevance of the metaphorical expression *fingerprint*). Thirdly, we have focused on four genres which have not been compared in existing analyses of climate change metaphors (e.g., Doyle 2007; Koteyko, Thelwall, & Nerlich 2009; Koteyko 2010; Ly 2013; Atanasova & Koteyko 2017a; 2017b; Deignan 2017). These four genres have helped us to document the adaptation of metaphors and the influence of ideological stances on this adaptation. Additionally, the four genres have revealed genre-specific prevalence of metaphorical use to describe climate change. Our discourse historical approach has promoted the identification of a link between a wide range of climate change events and metaphorical descriptions. In contrast, existing research often focuses on the influence of a single event on these descriptions (e.g. Nerlich 2010). Overall, our research has supplemented existing findings with a qualitative analysis of genre-specific use of metaphors (Trumbo 1996; Schafer & Schlichting 2014; Shaw & Nerlich 2015). We have also supplemented existing qualitative findings about climate change metaphors (Doyle 2007; Koteyko 2010; Ly 2013; Nerlich & Hellsten 2014; Knudsen 2015) with the identification of salient narratives and scenarios in the four genres: our results show that the narratives EARTH AS A TRANFORMED HOUSE, NATURE AS A DAMAGED CONTAINER, and CLIMATE CHANGE AS A CONFLICT prevail in all genres under study.

The initial aim of our research on the use of metaphor scenarios and narratives in different genres and on metaphorical adaptation was motivated by the characteristics of different discourses about climate change. Existing literature has shown that the original

meaning of a particular metaphorical expression is sometimes ignored by the researchers. Even though this original meaning cannot be established in an assertive way, we have focused on the similar metaphorical perspectives observed these different discourses. The initial hypothesis was that scientific papers have influenced the use of metaphor scenarios in environmentalist communication which, in turn, has been discussed by politicians whose speeches and decisions have been reported in newspapers linking these different discourses. The results from the qualitative analysis and the distribution patterns of narratives and scenarios in the four genres showed that journalistic metaphorical descriptions share more features with the scenarios occurring in environmentalist discourse, compared with the features of the scenarios occurring in other genres. The analysis of additional genres could yield significant results and could show relevant variation in the way the scenarios are adapted. For example, we can investigate the use of these scenarios by "lay" people on the social media. The analysis of social media would help us to identify scenarios which appear as part of personal comments on climate change, and whose use has not been motivated by editorial stances or publishing requirements. We can also investigate the use of climate change narratives and scenarios in politics through a more specific focus on different political parties. Although the focus of our research is on the varying use of climate change narratives in different genres, the analysis of additional political speeches would help us to associate a particular metaphorical viewpoint on climate change with a particular party. This focus would reduce the limitation of this research which only involves a small number of political speeches. Supplementary research would also establish – through a quantitative analysis – the evolution of sceptical metaphorical descriptions in newspapers.

An additional question can be raised about the use of climate change metaphors in different languages. Previous research has yielded significant results on the use of a particular scenario produced in English and in French (Augé 2019a). The variation in metaphorical meaning in English and in French shows that the occurrence of different or comparable scenarios in various languages can highlight specific depictions of the target domain.

10.5. Limitations

We conclude this research by considering the existing limitations that have had a significant influence on our findings. This influence can question several aspects of our research, but this section aims at justifying the methodological steps and decisions that could be debated.

We start by the explanation of our main methodology which has resulted in the composition of a large corpus[46]. This large corpus of various texts about climate change could not have been fully analysed manually: only a sample of the texts included in this corpus has permitted a manual selection of metaphors. We acknowledge that this methodology has possibly prevented us from providing a full account of climate change metaphors. Some metaphorical expressions may have been ignored despite their relevance to our research because they are used in the part of our corpus that has not been analysed manually. Although this represents a major limitation, we have investigated the remainder of our corpus through an automatic research, using the identified metaphorical units as search terms. We have relied on the results provided by the BNC to identify more metaphorical expressions (i.e., with the *Concordance tool*, the *WordSketch*, and *Thesaurus* functions of *SketchEngine*, Kilgarriff 2003). This reliance on the BNC helped us to identify significant metaphorical occurrences that are used in our corpus (e.g., *fingerprint*) but that are not discussed in existing literature. Therefore, we can provide a picture of metaphorical use that is relevant to the totality of our corpus, although we do not aim at establishing an exhaustive picture of climate change metaphors.

Additionally, the focus on particular perspectives (i.e., the characteristics of the topic which are metaphorically described in our corpus) and narratives has made it necessary to neglect various metaphors which have been identified in our corpus (e.g., *tipping points, acid rain*). To provide significant answers to our research questions, we

[46] Larger version of the corpus: Newspapers: 19,535 articles; *Nature*: 444 articles; *Friends of the Earth*: 867 articles; Political speeches: 98.
NEW scenarios: 3,294; SCI scenarios: 522; ENV scenarios: 316; POL scenarios: 76

Smaller version of the corpus: Newspapers: 18,656 articles; *Nature*: 331 articles; *Friends of the Earth*: 867 articles; Political speeches: 44 speeches.
NEW scenarios: 2,671; SCI scenarios: 342; ENV scenarios: 316; POL scenarios: 24

have analysed metaphors in relation to climate change narratives. These narratives were identified through the semantic relationship existing between the different source domains of the scenarios: our analysis of the corpus led us to identify several metaphorical occurrences in the four genres (relying on MIP Steen et al 2010; and on the BNC), we then used the source domains of these occurrences as search terms in the BNC in order to identify a possible semantic relationship between the source domains of different occurrences. When this semantic relationship was observed, we paid attention to the context of use of the metaphorical occurrences in our corpus to identify the narrative. Hence, the metaphors which could not be included within any of these narratives have been discarded. This is also a major limitation to the scope of our results but after several pilot analyses, we had to reduce the number of scenarios discussed in this research. This reduction helps us to present a concrete picture of the adapted meanings of metaphorical expressions in our corpus. Our interest in the use of metaphorical expressions in different genres does not require us to share an exhaustive picture of climate change metaphors: we focus on the similarities existing in the metaphorical descriptions of climate change in different genres and periods to observe how this adaptation takes place.

Even though an exclusively qualitative comparison was initially favoured, the distribution patterns observed through the frequency of use have proven to be more suitable for the analysis of the four genres. In Chapter 8, the distribution patterns of metaphor scenarios requires the identification of semantic "limits" for each scenario. While the quantitative analysis focuses on the similarities of metaphorical expressions conceived as part of a same scenario, the qualitative analysis prevents the concrete identification of such "limits" because the co-text of each metaphorical expression always alters its meaning, to some extent. The frequencies focus on the link between several metaphorical expressions, through a focus on the semantic fields associated with source domains and particular elements of the co-texts which help to establish this link.

Our discussion of the distribution patterns can be influenced by particular factors specific to each genre such as the number of articles, and the average number of words per article. We chose not to ignore or reduce the impact of these factors as they help to distinguish the particularities of each genre. However, the influence of these factors could have been reduced by analysing additional texts pertaining to the scientific, environmentalist, and political genres. Our focus on a single scientific journal and on a

single NGO is justified by our research interest: we investigate the scientific and environmentalist metaphorical stances on climate change, and the journalistic and political stances which display a wider variety of viewpoints on the topic (i.e., questioning or endorsement of scenarios). The number of political speeches in our corpus is also a major limitation. However, the limited number of political speeches has nevertheless yielded significant results about the particular metaphorical focus in this genre which is expressed in terms of a eulogistic perspective on nature.

Our qualitative study of scenarios in chapters 4, 5, 6, and 7 displays a wide range of specific aspects of metaphorical descriptions of climate change to convey particular arguments. This qualitative study is supplemented by the distribution patterns in Chapter 8 which distinguish concrete variations in the different genres and highlight the influence of particular events on climate change communication.

[Appendices: in attached material]

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