

Debunking Climate Change Denial. The Case of DeSmogBlog Project and Its Crusade Against Climate Misinformation Campaigns

Abstract: The discussion on the ideological and legal underpinning of climate change denial theories, recently inflaming political and institutional controversy around the world, merits closer linguistic scrutiny in order to take proper measure of its discursive impact on constructing denialist stakeholder stance. This study intends to investigate how the lobbying efforts of individuals and organizational think tanks, located in greater numbers in corporate America, have deliberately disseminated doubt concerning climate change. To this purpose, the investigation draws on data provided by DeSmogBlog, a counter-denialist project whose website contains profiles of those accused of routinely exposing denialist theories and policy issues through the world's most popular media outlets. In particular, the corpus of study comprises a collection of texts consisting of key quotes extracted from interviews, speeches, remarks and articles which are analyzed by implementing qualitative tools afforded by Critical Discourse Analysis (CDA) supported by Appraisal Theory and Stance frameworks. Preliminary results suggest that discursive patterns of denial, which lead to the formulation of a denial typology, are embedded in strategies employed by those involved in the concerted effort to discredit scientific consensus over climate change.

Keywords: *climate change denial, global warming, denial strategies, denial typology, stance*

1. Introduction

Climate change has a far bigger impact on humanity than fully acknowledged by institutions, media outlets and public opinion. As an existential issue for every individual, the effects of climate change have already been observed on every continent regardless of geographical position or economic ranking in terms of GDP (Gross Domestic Product) poverty levels.¹ The complexity of approaching this issue at a global level, its relatedness to the extensively criticized proof of anthropogenic causes, and general disinformation are just some of the reasons why countries who have enhanced their

¹ Marshall Burke et al., "Global Non-linear Effect of Temperature on Economic Production", *Nature: International Journal of Science*, 527 (2015), 235-239; Kris M. Wilson, "Communicating Climate Change through Media: Predictions, Politics, and Perceptions of Risk", in Stuart Allan et al., eds., *Environmental Risks and the Media* (London: Routledge, 2000), 201-217.

ambition towards climate change policies still have a long road ahead of them.² The very nature of climate science constitutes an additional reason: the inevitable and endemic uncertainties involved in scientific research have induced the dismissal of environmental changes along with the public's confidence in the work of scientists.³

Learning about climate change means questioning, for example, what is being done to limit greenhouse gas emissions, the loss of Arctic sea ice and the increase of sea levels. But climate change only became a political issue in the early 1990s when some nations of the world came together to require scientific research and climate change observations. As a result, the United Nations Intergovernmental Panel on Climate Change (IPCC) took upon itself to provide policymakers around the world with the latest and best science information.⁴ However, almost simultaneously to this increased attention on climate change, a counter-position began to gain ground by generating fears of international action to reduce carbon emissions from fossil fuels. These fears were then crystallized by the 1997 Kyoto Protocol which entered into force on 16 February 2005.⁵ The global Paris agreement in 2015 was another major step forward as more than 190 nations unanimously agreed to do what it takes to keep total global warming below 2°C (3.6°F). Unfortunately, one of the world's biggest emitter, the United States, abandoned the Paris deal in 2017, although it cannot officially announce its plan to withdraw from the agreement until 4 November 2019, consequently delaying action to avoid serious climate impacts in the coming decades.⁶

According to the latest data from the 2018 IPCC Climate Change report on global warming of 1.5C, there is abundant proof that climate change is not an invention, just as there is concrete testimony that human beings, as observed since the mid-twentieth century, are largely responsible for it.⁷ Yet, it has also been observed that international agreement on the concrete effects of climate change is difficult to secure, notwithstanding the fact that our climate has been changing far faster than the early predictions

² Rebecca M. Henderson et al., "Climate Change in 2018: Implications for Business", *Harvard Business School Background Note* 317-032 (October 2016, revised January 2018), 317-356.

³ Riley E. Dunlap, "Climate Change Skepticism and Denial: An Introduction", *American Behavioral Scientist*, 57.6 (2013), 691-698.

⁴ The Intergovernmental Panel on Climate Change (IPCC) is the international body for assessing the science related to climate change set up in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) http://www.ipcc.ch/news_and_events/docs/factsheets/FS_what_ipcc.pdf, accessed 20 March 2018.

⁵ Aaron M. McCright and Riley E. Dunlap, "Challenging Global Warming as a Social Problem: An Analysis of the Conservative Movement's Counter-claims", *Social Problems*, 47 (2000), 499-522. Kyoto Protocol (1997) implemented the objective to reduce the onset of global warming by reducing greenhouse gas concentrations in the atmosphere. To date, there are 192 signatory parties.

⁶ Trevor Nace, "America Is Officially the Only Nation on Earth to Reject the Paris Agreement", *Forbes.com* (7 November 2017), <https://www.forbes.com/sites/trevornace/2017/11/07/america-is-officially-the-only-nation-on-earth-to-reject-the-paris-agreement>, accessed 20 March 2018.

⁷ IPCC, "Climate Change 2018", <https://www.ipcc.ch/>, accessed 20 March 2018.

made by climate scientists.⁸ Bodansky et al. explain that there are three major reasons for such world-wide reluctance. Firstly, climate change is closely intertwined with other issues of domestic policies often difficult to solve individually. Secondly, climate change requires long-term commitment and immediate action likewise difficult to sustain and undertake. Thirdly, climate change is not always classified as an environmental problem, but more of an economic problem with a cost-benefit perspective, with the former placing emphasis on reducing emissions and preventing anthropogenic changes, and the latter on reducing emissions but only as long as the benefits exceed the costs.⁹

While emphasizing the complexity of climate denial movement, especially in corporate America, the discussion undertaken throughout the study carries an underlying narrative which repeatedly questions the legality of this movement in terms of the real threats it poses on humanity. By identifying a set of denial strategies and denial types embedded in discourse, the investigation argues that corporate efforts, namely protecting activities from regulations and profit margins, have been instrumental in forestalling legal action against blocking environmental legislation from being passed.

2. Context of the Study

If we look at the literature from the past 10 years, climate change controversy has grown rapidly, disseminated especially through major media outlets which create dangerous echo chambers that influence public opinion and bring to the forefront influential political think tanks.¹⁰ Against this background of political, legal, economic and cultural controversy, the study intends to reveal what lies behind the half-truths which public opinion has been exposed to so far. What the study does not question, however, is whether climate change and anthropogenic causes are real or related; there is, by now, abundant proof that it is happening. Rather, the investigation focuses on the discursive strategies employed to dismiss climate change theories and how denialists have managed to instill doubt in the public at large regarding a phenomenon that authoritative climate scientists have been recording for decades. To this purpose, a counter-denialist online blog, the Canadian-based DeSmogBlog, running in the US but with a sister website in the UK, was selected as the context of study. The blog's project

⁸ Daniel M. Bodansky et al., "Introduction to International Climate Change Law", *International Climate Change Law* (Oxford: Oxford U.P., 2017).

⁹ World Bank, *The Economics of Adaptation to Climate Change: A Synthesis Report* (Washington: The World Bank Group, 2010), https://siteresources.worldbank.org/EXTCC/Resources/EACC_FinalSynthesisReport0803_2010.pdf, accessed 20 March 2018.

¹⁰ Karen Bjornberg et al., "Climate and Environmental Science Denial: A Review of the Scientific Literature Published 1990-2015", *Journal of Cleaner Production*, 167 (2017), 229-241; Riley E. Dunlap and Aaron M. McCright, "Challenging Climate Change: The Denial Countermovement", in Dunlap and Robert J. Brulle, eds., *Climate Change and Society: Sociological Perspectives* (New York: Oxford U.P., 2015), 300-332.

aims to discuss “accurate, fact-based information regarding global warming misinformation campaigns”,¹¹ while debunking what lies behind the lobbying efforts of scientists, experts, corporate industries and conservative think tanks. DeSmogBlog regularly records on profile pages how these entities deliberately dismiss, with the aid of media interference, evidence concerning climate change and anthropogenic agency.¹² The profile comprises written and audio-visual materials about the individual or organization accused by DeSmogBlog of spreading denial theories, thus providing a general idea of how these social actors position themselves towards climate denial which is this study’s point of departure for its own inquiry into stancetaking, specifically conducted through a linguistic analysis of acts of speech in the key quotes expressing denial claims. The main argument underlying this analysis is based on the consideration that DeSmogBlog’s data not only provide access to the identification of denial strategies, but also lead to the identification of a denial typology. Hence, to achieve this twofold aim, qualitative analysis tools were implemented drawn from CDA, Appraisal Theory framework, and a comprehensive cognitive-functional stance framework (Table 3) developed from previous work by Simaki et al.¹³ This framework was applied by the author to analyze a collection of opinionated texts that made up their Brexit Blog Corpus. In conducting the analysis of the key quotes, this study considers the framework’s original ten notional stance categories namely, agreement/disagreement, contrariety, hypotheticality, necessity, prediction, source of knowledge, certainty, uncertainty, tact/rudeness, volition.

2.1 Research threads and caveats

Based on the structure of the investigation described above, the study is organized around three main research threads that inquire about:

- climate change denial strategies and discursive resources;
- environmental science denial stance in relation to scientific research evidence;
- climate change denial typology.

¹¹ DeSmogBlog website, <https://www.desmogblog.com/about>, accessed 20 March 2018.

¹² Andrew Hoffman and John Woody, *Climate Change: What’s Your Business Strategy?* (Boston: Harvard Business School, 2008); Wilson, “Communicating Climate Change”.

¹³ Ruth Wodak, “Pragmatics and Critical Discourse Analysis: A Cross-disciplinary Inquiry”, *Pragmatics and Cognition*, 15.1 (2007), 203-225; James R. Martin and Peter R. R. White, *The Language of Evaluation: Appraisal of English* (London: Palgrave Macmillan, 2005); Vasiliki Simaki et al., “Annotating Speaker Stance in Discourse: The Brexit Blog Corpus”, *Corpus Linguistics and Linguistic Theory*, aop (2017), <https://www.degruyter.com/view/j/cllt.ahead-of-print/cllt-2016-0060/cllt-2016-0060.xml>, accessed 20 March 2018.

One of the caveats involved when investigating data from controversial online sources is the element of researcher subjectivity that goes into the selection of material operated by a focus group, likely to insist on certain aspects that will work for their cause.¹⁴ It is the study's view, however, that DeSmogBlog's denialist profiles afford the opportunity to decipher the logic of denial and how it attempts to erode existing scientific evidence on climate change.

Related to the above is the next caveat which involves the vector of communication, or the blog. Blogs are particularly convincing in the coverage of controversial issues such as climate change debates, mostly owing to their inherent features of generating discussion and effectively disseminating topics among broader international audiences.¹⁵ By acknowledging the fact that previous research has abundantly provided evidence of the effectiveness of blogs, this investigation specifically focuses on the DeSmogBlog project rather than the nature of blog's medium affordances albeit the latter might very well be the object of future research.

One final caveat, which is more of a terminological clarification, is agreeing on climate-related definitions. The first two terms, climate change and global warming, are frequently used interchangeably. This study uses the explanation provided by NASA scientists which explains that both terms are two sides of the same coin. Specifically:

Global warming refers to the long-term warming of the planet since the early 20th century, and most notably since the late 1970s, due to the increase in fossil fuel emissions since the Industrial Revolution....¹⁶

Climate change refers to a broad range of global phenomena created predominantly by burning fossil fuels, which add heat-trapping gases to Earth's atmosphere. These phenomena include the increased temperature trends described by global warming, but also encompass changes such as sea level rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and extreme weather events.¹⁷

Climate denial and climate skepticism are the next two terms requiring a minimum of contextual clarification. It is worth noting that the former refers to a set of attitudes and behaviors whereby conspiracies are commonly invoked, legitimate debate is avoided, and personal attacks are

¹⁴ Carl Ratner, "Subjectivity and Objectivity in Qualitative Methodology", *FQS: Forum Qualitative Social Research / Sozialforschung*, 3.3, Art. 16 (2002), <http://www.qualitative-research.net/index.php/fqs/article/view/829/1800>, accessed 20 March 2018.

¹⁵ Amelia Sharman, "Mapping the Climate Sceptical Blogosphere", *Global Environment Change*, 26 (2014), 159-170.

¹⁶ NASA, "Global Warming", *NASA Earth Observatory* (2018), <https://climate.nasa.gov/resources/global-warming>, accessed 20 March 2018.

¹⁷ Ibid.

committed.¹⁸ The latter, if conducted with an open mind, can contribute to a healthier debate as it refers to attitudes that allow for and invite greater public involvement in discussing controversial issues. Hence, the terms deriving from the noun ‘denial’ are more consistently used in this study as they better correspond to DeSmogBlog’s mission against all forms of dismissal.

2.2 Corpus

The study’s corpus, at the time of writing, comprises data extracted from 578 profiles, specifically divided into 392 individuals (14 female, 378 male) and 186 organizations mainly operating in the US, reported by DeSmogBlog as being responsible for consistently spreading denialist narratives. These profiles contain information as to who these social actors are, what they do, who they work for, and the deeds undertaken towards the rejection of climate change. Their diverse fields of work, study or pursuits are listed in Table 1. DeSmogBlog’s project mainly consists in analyzing the radio and TV interviews, speeches, remarks, articles or essays released by the profiled individuals, and arrange them under 9 headings on their Research Data Page: credentials, background, stance on climate change, key quotes, key deeds, affiliations, publications, resources, other resources. The present corpus takes into consideration the Key Quotes category as it presents a collection of linguistic data such as speech acts, modality, discourse markers and other parts of speech where aspects of stancetaking can be located. Specifically, the corpus analyzes a total of 32 key quotes of 5 profiled social actors for a total of 123 lexical chunks.

Individuals	Experts (meteorologists, climate engineers, geologists) Field-related experts in climate science (physicists, medical doctors, science writers) Self-proclaimed experts (academics, business analysts, TV and radio hosts, journalists) Politicians
Organizations	Governmental or institutional think tanks (religious, ethnic, economic) Corporations and industries

Table 1. Denialist individuals and organizations reported by DeSmogBlog.com

The diversity of positions and roles listed in Table 1 provides evidence that Climatology is probably a popularized area of study, and many people even outside a specific community of climate scientists, feel entitled to ascribe to various theories and become self-proclaimed experts.¹⁹ In fact, DeSmogBlog’s profiles, to date, contain only a small number of climate scientists, mainly from affiliated communities of meteorologists, geologists or climate engineers, who are involved in

¹⁸ Stephan Lewandowsky et al., “Science and the Public: Debate, Denial, and Scepticism”, *Journal of Social and Political Psychology*, 4.2 (2016), 536-553.

¹⁹ Dunlap, *Climate Change Skepticism*.

spreading denial narratives,²⁰ and even fewer ones are from field-related backgrounds. The majority are, in truth, self-proclaimed experts with very different backgrounds (Table 1).

Regarding the profiles of organizations, the majority represent conservative think tanks, corporations and industries inimical to climate science, either for personal or company reasons, mainly involved in the lucrative activities of oil and coal extraction. But there are also tobacco and car industries espousing the denial campaign by claiming their own right to contribute to the economic progress of the country.

2.3 About DeSmogBlog

DeSmogBlog, notwithstanding its commendable effort to expose climate change denialists, does not apparently have a totally clean record in terms of its mission statement. In fact, the blog has been accused of being a highly politicized alarmist website whose project is to hunt down climate change skeptics. These sources²¹ base their charges on the fact that the site was co-founded by lawyer and Internet entrepreneur John David Lefebvre, convicted of money laundering in 2006, and controlled by James Hoggan, owner of Hoggan and Associates, a for-profit public relations firm based in Canada.

This study argues, however, that DeSmogBlog's endeavor has brought to light faces and names involved in fueling climate change denial. Indeed, because DeSmogBlog is a highly organized PR campaign, whose associates are climate writers, scientists, climate journalists, authors, lawyers and other professionals, it affords a broader viewpoint on the unethical actions of denial stakeholders. Thus, by exploring counter-denial sources other than the ones provided by recognized climate science, the project's aim is to contend that the denialist movement, one that strives to counter the threat of anthropogenic interference, is actually "clouding the science on climate change".

3. Methodology

Qualitative research analysis methodology was considered best able to follow the pattern of discursive strategies that convey the logic of denial embedded in social, cultural and political instantiations.²² Hence, as mentioned earlier, the study draws heavily on CDA-based approaches implemented through

²⁰ Myanna Lahsen, "Anatomy of Dissent: A Cultural Analysis of Climate Scepticism", *American Behavioral Sciences*, 57.6 (2013), 732-758.

²¹ For sources criticizing DeSmogBlog, see LeftExposed, "DeSmogBlogSources" (2017), <http://leftexposed.org/2016/08/desmogblog>, accessed 20 March 2018.

²² Wodak, *Pragmatics*.

appraisal resources and the closely related concept of stance to detect denial strategies and a stance typology.²³

Drawing on Martin and White's extensive work, the meaning-making resources afforded by their appraisal framework provide accounts of the interpersonal meanings of a text explaining social roles, identities, and relationships, and their correlation with speech functions, involvement levels and positionings. As widely known, the general goal of Martin and White's framework, as illustrated in figure 1, is to model the dialogic effects of meanings in three semantic regions which are instantiated by resources at all levels of the language system.²⁴ These areas are: attitude (resources for construing emotional responses and value judgements, both ethical and aesthetic); engagement (resources to adjust the speaker's commitment to his or her evaluations); graduation (resources to quantify, intensify and compare these evaluations).

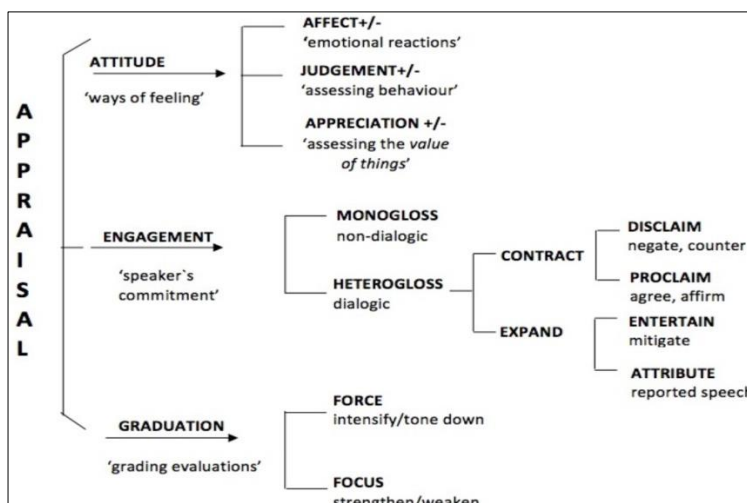


Figure 1. Martin and White Appraisal Framework

²³ Ibid.; Martin and White, *The Language of Evaluation*; Simaki et al., "Annotating Speaker Stance"; Douglas Biber, "Stance in Spoken and Written University Registers", *Journal of English for Academic Purposes* 5 (2006), 97-116; Ken Hyland, "Stance and Engagement: A Model of Interaction in Academic Discourse", *Discourse Studies* 7.2 (2005), 173-192.

²⁴ In figure 1, the appraisal system is adapted from Martin and White, *The Language of Evaluation*, 38.

Table 2 below illustrates the appraisal resources used in the data analysis and the relative acronyms referenced in the grids.

Resource	Subcategory	Acronym
Attitude	Affect	Aff
	Judgement	Judg
	Appreciation	App
Engagement	Heterogloss	Eng (H): (C) (D)
	Monogloss	Eng (M)
Graduation both Force and Focus are indicated as Graduation; a distinction is made only when required.	Force	Grad
	Focus	

Table 2. Appraisal System adapted from Martin and White

The analysis of speaker stance covers a wide range of related concepts such as modality,²⁵ subjectivity,²⁶ and sentiment.²⁷ In this study, the investigation of linguistic data concerning stance will be conducted by including the ten comprehensive categories in the Simaki et al. framework,²⁸ a tool which fine-tunes the analysis through additional specifications that refer to acts performed by social actors which focus on expressed beliefs towards objects, events, propositions and viewpoints on what is talked about.²⁹

By interconnecting both the appraisal and stance frameworks, it is this study's view that the identification and isolation, at a more granular level,³⁰ of stakeholder positioning embedded in the linguistic expressions will be greatly enhanced. Table 3 below lists these stance categories and their acronyms as well as a selection of linguistic instantiations pertaining to each category.³¹

²⁵ Frank Palmer, "Modality in English: Theoretical, Descriptive and Typological Issues", in Roberta Facchinetti et al., eds., *Modality in Contemporary English* (New York: Mouton de Gruyter, 2003), 1-18.

²⁶ Dylan Glynn and Mette Sjölin, "Subjectivity and Epistemicity", in Dylan Glynn and Mette Sjölin, eds., *Subjectivity and Epistemicity: Stance Strategies in Discourse and Narration* (Lund: Lund U.P., 2015).

²⁷ Marjan Van de Kauter et al., "The Good, the Bad and the Implicit: A Comprehensive Approach to Annotating Explicit and Implicit Sentiment", *Language Resources and Evaluation*, 49.3 (2015), 685-720.

²⁸ Simaki et al., "Annotating Speaker Stance".

²⁹ John W. Du Bois, "The Stance Triangle", in Robert Englebretson, ed., *Stancetaking in Discourse: Subjectivity, Evaluation, Interaction* (Amsterdam: John Benjamins, 2007), 163.

³⁰ Saif M. Mohammad et al., "Stance and Sentiment in Tweets", *ACM Transactions on Internet Technology (TOIT)*, 17.3 (2017).

³¹ The stance categories are adapted from Simaki et al., "Annotating Speaker Stance".

Stance categories	Description	Linguistic instantiations
Agreement/Disagreement (Ag/Disag)	expressing a similar or different opinion	agree/don't agree, do/don't do, in contrast to, my opinion is, etc.
Contrariety (Contra)	expressing a compromising or a contrastive/comparative opinion	but, if not, than, while, not only, this is not, not to...but to, even if, rather than, as bad as, either or, although, less about, etc.
Hypotheticality (Hypo)	expressing a possible consequence of a condition	if, then, would, should they, what would happen if, had...wouldn't, unless, if...will
Necessity (Nec)	expressing a request, recommendation, instruction or an obligation	let, must, need, should, to, it's worth remembering, keep this in mind, let's not try, will require, etc.
Prediction (Pred)	expressing a guess/conjecture about a future event or an obligation	be, will, tomorrow, will be, might see, will concern, will happen, etc.
Source of Knowledge (SoK)	expressing the origin of what is said	said, say that, I've seen/known, calculate that, it seems that, get the impression, you may note, think, etc.
Uncertainty (Uncert)	expressing doubt as to the likelihood or truth of what is said	could, maybe, may, might, probably, think, not necessarily, seem to be, perhaps, may/could, hardly, likely, etc.
Certainty (Cert)	expressing confidence as to what is said	certainly, sure, of course, no doubt that, etc.
Tact/Rudeness (Tt/Rud)	expressing pleasantries and unpleasantries	contrastive notions on the dimensions of politeness; direct vs. indirect, etc.
Volition (Vol)	expressing wishes or refusals, inclinations or disinclinations.	want, prefer, wish, desire, etc.

Table 3. Stance categories adapted from Simaki et al.

3.1 Procedure

The methodological interaction of both frameworks is performed by implementing a three-step analysis procedure regarding the key quotes. It is important to note that the analysis of the example provided in each lexical chunk will be coded by either the appraisal (Table 2) or stance category (Table 3) or both, depending on which one or ones best represent that particular item.

During the first step, aspects of evaluative language are identified by highlighting inscribed or invoked lexical chunks. Each are coded according to the appraisal and stance resources (right column), bearing in mind, as mentioned above, that as the two frameworks are closely interrelated and concur in detecting stance, categories are likely to co-occur in a single act (e.g. *prediction and source of knowledge, uncertainty, certainty and source of knowledge*).

The second step identifies strategy patterns by clustering similar annotated lexical chunks under a broadly-defined denial strategy category.³² This is discussed in the commentary.

The final and third step involves taking an even broader view of these strategies to detect a climate change framing device, or denial typology presented in the Discussion section.³³

4. Analysis

The following selection of the profiles from the DeSmogBlog corpus are listed as: climate expert, self-proclaimed expert, field-related expert and politician, for the individuals; think tank and industry, for the organizations.³⁴ The 32 key quotes are arranged in the analysis grids below listed in progressive numbers. Each key quote has been broken down into numbered segments (left column) to facilitate the analysis and coding of the appraisal and stance resources (listed as acronyms in the right column); readability is also facilitated by boldfacing the lexical example. The qualitative analysis is then followed by a general commentary connecting the appraisal and stance resources to the embedded denial strategy(ies).

4.1 Expert: Friedrich-Karl Ewert

Geologist and emeritus professor of geophysics at the University of Paderborn		
	Key Quotes	Appraisal and stance resources
1	1.1 Contrary to computer-based scenarios, and contrary to 1.2 what is generally believed , anthropogenic CO2 1.3 is meaningless 1.4 because its influence 1.5 is not recognizable. 1.6 Of course , this result complies with 1.7 the basic laws of physics and 1.8 is not really surprising.	Contra Grad Judg SoK Contra; App Cert; Judg App Contra; Grad; App

³² Dennis W.C. Liu, "Science Denial and the Science Classroom. CBE", *Life Science Education*, 11.2 (2012), 129-134; Matt Ferkany, "Is It Arrogant to Deny Climate Change or Is It Arrogant to Say It Is Arrogant? Understanding Arrogance and Cultivating Humility in Climate Change Discourse and Education", *Environmental Values*, 24.6 (2015), 705-724; Wendee Holtcamp, "Flavors of Uncertainty: the Difference between Denial and Debate", *Environmental Health Perspectives*, 120.8 (2012), A314-A319.

³³ Stanley Cohen S., *States of Denial: Knowing about Atrocities and Suffering* (Cambridge: Polity Press, 2001); Stefan Rahmstorf, "The Climate Sceptics" (Potsdam: Potsdam Institute for Climate Impact Research, 2004), http://www.pik-potsdam.de/~stefan/Publications/Other/rahmstorf_climate_sceptics_2004.pdf., accessed 20 March 2018; Bjornberg et al., "Climate and Environmental Science Denial".

³⁴ All profiles have been last accessed and checked on the DeSmogBlog.com website on 30 December 2018. Therefore, no further references are made in the analysis grids.

2	<p>2.1 The facts are: Ever since the Little Ice Age, we have been warming up again.</p> <p>2.2 We don't have global climate change; what we have are normal temperature fluctuations.</p> <p>2.3 We have had parallel cooling and warming episodes.</p> <p>2.4 No CO2 influence can be detected.</p> <p>2.5 Since 2000, we have been cooling off again.</p> <p>2.6 And, data have been manipulated in order to fake a warming trend: Climategate.</p> <p>2.7 The IPCC's scenarios are failures. And in conclusion, ladies and gentlemen,</p> <p>2.8 This analysis can be verified—any one of you can do it!</p>	<p>SoK Grad Contra; SoK Graduation SoK Cert Grad; SoK SoK; Judg App Eng (C)</p> <p>Eng (E)</p>
3	<p>3.1 Between the years 2010 and 2012 the data measured since 1881</p> <p>3.2 were obviously altered so that</p> <p>3.3 they showed a significant warming, especially after 1950....</p> <p>3.4 A comparison of the data from 2010 with the data of 2012 shows that NASA-GISS had altered its own datasets so that especially after WWII, a clear warming appears – although it never existed.</p>	<p>Grad Eng (C) SoK; Grad SoK App Eng (C)</p>
4	<p>4.1 Increasing solar activity is probably the reason for</p> <p>4.2 a slow global warming since the mid-19th century.</p>	<p>Grad; Uncert; Grad</p>

Table 4. Key quotes from Friedrich-Karl Ewert

Ewert relies on the functions of contrariety to establish, first and foremost, the inexistence of climate change and its relation to anthropogenic causes (1.1, 2.2, 2.4.). In quote 1, his reasons mainly deal with evidence considered meaningless (1.3) and not recognizable (1.5). He then leverages his knowledge as a geophysics expert to back his evaluations as basic laws of physics (1.7). Quote 2 starts off with the word 'facts' (2.1) that he tries to establish throughout his narrative. He first dismisses the analysis conducted by climate scientists (2.8), claiming a manipulation of data (2.6), and then steers the focus on past occurrences (3.1-3.4) by counting on the graduation resource of time. In quotes 3 and 4, he admits there might be a slow (4.2) warming of the planet, but it can be attributed to natural and unavoidable causes.

His denial strategies are based on the tactic of questionability of evidence and his self-proclaimed role as climate expert. His stancetaking reinforces the claim that climate change is not occurring and uses past experience to prove it.

4.2 Self-proclaimed expert: Ralph B. Alexander

Associate Professor of Physics at Wayne State University and former President and co-founder of Ion Surface Technology		
	Key Quotes	Appraisal and stance resources
1	<p>1.1 We have accounts of major droughts and flooding for two hundred years.</p> <p>1.2 And the 2005 drought was not the worst.</p>	<p>SoK</p> <p>Grad; Contra</p>
2	<p>2.1 Climate-change sceptics might be regarded as modern-day witches</p> <p>2.2 because they think that global warming comes from natural forces.</p> <p>2.3 However, it's superstitious alarmists, ...</p>	<p>Eng (E); Grad; Judg SoK Contra; Judg</p>

	2.4 who are really the witches.	Eng (C); Cert
3	3.1 I am offended that science is being perverted in the name of global warming, 3.2 today's environmental <i>cause celebre</i> .	Aff; Eng; App Judg
4	4.1 The Earth has supported abundant life many times in the geological past when 4.2 there were much higher levels of carbon dioxide in the atmosphere. 4.3 It is quite likely that future generations will benefit from the enrichment of 4.4 Earth's atmosphere with more carbon dioxide.	Grad Grad SoK; Pred Grad
5	5.1 Greenhouse gas emissions... are part of human industrial and agricultural activity. 5.2 While substantial concern has been expressed that emissions may cause 5.3 significant climate change... records indicate that 20th and 21st century changes 5.4 are neither exceptional nor persistent ... 5.5 there is an extensive scientific literature that examines beneficial effects of 5.6 increased levels of carbon dioxide for both plants and animals.	Eng (C) Contra Uncert Grad Contra; Judg SoK; App Grad

Table 5. Key quotes from Ralph B. Alexander

Alexander also counts on the time factor (1.1, 2.1, 4.1, 5.3) to establish that climate change is part of our history, with higher or lower manifestations, and can be attributed to natural causes. He also ridicules the alarmists (2.3) who try to discredit climate skeptics through acts of name calling (2.1), but then resorts to doing the same (2.4). His other tactic is based on discrediting the theory of global warming by calling it a scientific perversion (3.1) and a trend (3.2). In quote 5 he somewhat acknowledges that climate change may have some effects (5.3), but that these are beneficial to the environment as stated in the literature (5.5).

Alexander generally adopts the strategy of blaming the alarmists for concocting conspiracy theories against denialists. He relies on the 'it's in the literature' as his source of knowledge (4.3, 5.5) but remains vague as to scientific data. He promotes the benefits of climate change by taking a stance against expert opinion and facts.

4.3 Field-related expert: Joanne Nova

Bachelor of Science degree in microbiology from the University of Western Australia		
	Key Quotes	Appraisal and stance resources
1	1.1 Good people of Earth are spending thousands of billions of dollars to prevent a future with predicted by models that we know don't work 1.2 The debate is over , climate spending is an unscientific, pagan, theological quest to 1.3 change the weather. Just another iteration of what Druids and Witchdoctors 1.4 have been promising for eons .	App; Contra; SoK Eng (C); Judg Judg Grad

2	2.1 The real story is that everyone wants 2.2 a nicer climate, 2.3 But most people know 2.4 it's a waste of money. 2.5 That's why this is a 2.6 dead topic in the election.	Sok; Vol; Grad Contra Judg Judg Sok Judg
3	3.1 Finally, I know there is a decent survey on the topic, 3.2 and it shows that less than half of what we would call 'climate scientists' who 3.3 research the topic and for the most part , publish in the peer reviewed literature, 3.4 would agree with the IPCC's main conclusions. Only 43% of climate scientists agree 3.5 with the IPCC ' 97% ' certainty. 3.6	SoK; Grad; Judg SoK; Grad Grad; App Eng (E); Grad Grad
4	4.1 There is a good reason climate scientists are failing to convince other 4.2 scientists — their evidence is weak — and any good scientist can see that ,	Sok; Eng (C); Judg; Eng (E);
5	5.1 If, hypothetically , there are scientific gaps in the theory of man-made global 5.2 warming, for the most part we are leaving it up to volunteers to find them. 5.3 It's as if the government has funded a team of QCs for the prosecution 5.4 but spent nothing on legal aid for the defense.	Hypo Grad; Judg Eng Contra
6	6.1 The swelling ranks of inquiring sceptical scientists is now the largest whistle-blowing 6.2 cohort 6.3 in science ever seen. It includes some of the brightest: two with Nobel prizes in 6.4 physics, four NASA astronauts, 9000 PhDs in science, and another 20,000 science 6.5 graduates to cap it off. A recent US Senate minority 6.6 report contained 1000 names 6.7 of eminent scientists who are sceptical , and the term professor pops up more than 6.8 500 times in that list.	Grad; Judg App; Grad Grad SoK; Grad; Judg Grad Judg Grad

Table 6. Key quotes from Joanne Nova

Nova believes that negative climate change effects can be traced back to pagan times (1.3) and, therefore, any alarm created by these false claims results in the spending of good people's (1.1) money (1.2). Quotes 1 and 2 are, indeed, all about careless spending that has been going on for ages (1.4) which ultimately leads to a dead end (2.6). In quote 3 she offers her field-related expertise by arguing that many recognized climate scientist (3.2), who even manage to get their work published (3.3), disagree with the results of the IPCC concerning the severity of climate change (3.5). Her strategy is to pit good science (hers) against the bad one (the others) (4.1, 4.2) which ultimately relies on volunteers (5.2) to do the work. She builds on hypotheticality to instill doubt and engage the interlocutor in her line of reasoning, and in Quote 6 force (6.1, 6.2, 6.3, 6.4, 6.6) and focus (6.3, 6.4, 6.5) are used to prove her point. Her source of knowledge is mainly based on hearsay and minority reports (1.1, 2.1, 3.1, 6.4).

The main denial strategy is reliability of research evidence. She claims that skeptical science, due its inquisitive nature, is more reliable than counter-denial science but supports this view by simply mentioning numbers. Her stancetaking is construed by a strong mistrust towards climate scientists and their needless alarmist attitude.

4.4 Politician: Donald Trump

45 th President of the USA		
	Key Quotes	Appraisal and stance resources
1	1.1 I think something's happening. Something's changing and it'll change back again. 1.2 I don't think it's a hoax , I think there's probably a difference. 1.3 But I don't know that it's manmade . 1.4 I want to say this. I don't wanna give trillions and trillions of dollars. 1.5 I don't wanna lose millions and millions of jobs. I don't wanna be put at a disadvantage .	SoK; Pred SoK; Uncert SoK; Judg Vol; Grad Vol; Grad Judg
2	2.1 I want to use hair spray... 2.2 They say , 'Don't use hair spray, it's bad for the 2.3 'ozone.' So, I'm sitting in this concealed apartment, ... I don't think anything gets out.	Vol SoK SoK
3	3.1 While the world is in turmoil and falling apart in 3.2 so many different ways—especially 3.3 with ISIS—our president is worried about global warming, he [Obama] 3.4 said. What a ridiculous situation.	Contra Grad App Judg
4	4.1 I'm not a believer in man-made global warming. It could be warming, 3.1 and it's going start to cool at some point. 3.2 And you know , in the early, in the 1920s, people talked about global cooling... 3.3 They thought the Earth was cooling. 3.4 Now, it's global warming... But ... I don't think in any major fashion exists.	Contra; Uncert Pred SoK SoK Contra; SoK
5	5.1 The United States will certainly cease all 5.2 implementation of the non-binding Paris Accord	Pred; Cert Judg
6	6.1 Staying in the agreement could also pose serious obstacles for the United States as we begin the process of unlocking the restrictions on 6.2 America's abundant energy reserves .	Uncert; Judg Grad
7	7.1 Even if the Paris Agreement were implemented in full, ... it is estimated it would only 7.2 produce a two-tenths of one-degree Celsius reduction in global temperature by the year 2100.	Hypo Grad
8	8.1 It's freezing and snowing in New York -- we need global warming!	Nec
9	9.1 [...] Right now we're at the cleanest we've ever been and that's very important to me. 9.2 But, of course, if we're clean, but every other place on Earth is dirty , that's not so good . So, I want 9.3 clean air, I want clean water, very important.	Judg; Grad Judg Eng; Grad; App Judg; Vol

Table 7. Key quotes from Donald Trump

Trump's general attitude towards climate change is based on a strong denial of anthropogenic causes (1.3, 4.1), and an attribution of blame on other countries (9.2). Throughout his quotes, volition and judgment are the two main functions that support this logic (1.4, 3.4, 6.1, 9.2). He argues that climate change is a minor problem (3.1, 3.2) in the face of other issues that need more attention. In fact, he uses sarcasm (3.3, 8.1), past time (4.3) and the argument that America can make it on its own (6.2) to highlight his point. The 'you know' in 4.3 is quite interesting as this expression is often used for

discourse organization or a verbal routine but, in this context, it connects the present to the past. He also often uses his own source of knowledge to call in other actors (2.2, 4.3, 4.4). However, it is worth noting that his source of knowledge is often insufficient (1.2, 2.3, 4.5) as it is scaled down to a level of uncertainty. He states that he is the first to want (9.2) clean air, thus affirming that he is not against measures, but that the rest of the world (9.2) should contribute. This all leads to the withdrawal from the Paris Accord (quote 5).

Trump's offensive denial strategies are based on counter arguments deriving from misinterpretation of research (4.1-4.4) and conspiracy theories. By questioning measures that fight climate change (7.1, 7.2), he justifies the fact that this evidence is not enough to stop American progress and, therefore, endorses fossil fuel extraction. Trump's stancetaking strategy, despite his weak form of openness to discussion, is one of full denial. However, as can be inferred, his position is not the result of pure conviction that climate change is not happening, but it is most likely shaped by his newly-acquired power as businessman turned President, a power which he exploits in order to safeguard all corporate interests.

4.5 Think Tank: The Heartland Institute

The Heartland Institute is a Chicago-based free market think tank		
	Key Quotes	Appraisal and stance resources
1	1.1 Maybe two-thirds of the warming in the 1990s was due to natural 1.2 causes; forecasts of future warming are unreliable ; and the benefits of 1.3 a moderate warming 1.4 are likely to outweigh the costs.	Uncert; Grad Judg Grad Pred
2	2.1 You may also know us from our work exposing 2.2 the shoddy science and missing economics behind the global warming 2.3 delusion . 2.4 Some say the earth is warming. Some also said the earth was flat.	SoK; Eng (E) Judg; Judg SoK; Grad
3	3.1 Some environmentalists call for a ' save-the-day ' strategy to 'stop global 3.2 warming.' Such a position seems logical until we stop to think: 3.3 Immediate action wouldn't make us any safer , but it would surely make 3.4 us poorer .	SoK; Grad; Judg Eng Uncert; Grad Grad
4	4.1 Unfortunately , global warming is an issue that is well suited to 4.2 political demagoguery , which can be defined as pandering to 4.3 misinformed voters and promising unrealistic solutions .	Judg Judg Judg

Table 8. Key quotes form the Heartland Institute

In many of the quotes (2.2, 3.1, 4.1, 4.2), Hartland Institute seems to question the work accomplished by climate science and by other fields of study that are impacted by climate change (2.2). In fact, as a highly conservative think tank, the Institute totally dismisses the negative effects of

climate change in the economic sector. Indeed, its members use sarcasm and parallelisms (2.4) to state that any action taken towards ameliorating change will make the world poorer (3.3), and attribute claims of public beguilement (4.3) to the meddling work of politicians (4.2). Their source of knowledge also seems to rely on unspecified literature (2.1, 2.4, 3.1).

Clearly, the Heartland Institute, as a conservative, libertarian, and right wing think tank, conducts work that aims to question scientific results regarding climate change and has also lobbied against many other health related reforms such as passive smoking. The main defensive denial strategy is the dismissal of negative results obtained from scientific research. On the offensive side, Heartland claims that reformists have construed conspiracy theories against them and against economic progress. Generally speaking, the Institute's stancetaking perspective insists on the scarce reliability of climate scientists and their scientific evidence.

4.6 Industry: CO2 Coalition

The CO2 Coalition was established in 2015 as an organization for the purpose of the general public about the important contribution made by carbon dioxide and fossil fuels to our lives and the economy.		
	Key Quotes	Appraisal and stance resources
1	1.1 The positive impacts of atmospheric CO2 enrichment remain largely 1.2 under-appreciated or ignored in the debate over what to do or not do 1.3 about rising CO2 concentrations in the future 1.4 atmospheric CO2 is not a pollutant ; it is, in fact, the very elixir of life.	Judg Grad; App Grad; Pred Contra; Grad
2	2.1 [O]bservations ... show that increased CO2 levels over the next 2.2 century will cause modest and beneficial warming ... and that this 2.3 will be an even larger benefit to agriculture than it is now.	SoK; Grad Pred; Judg Pred; Grad
3	3.1 The costs of emissions regulations, which will be paid by everyone, will 3.2 be punishingly high and will provide no benefits to most people 3.3 anywhere in the world ... Yes, there will be mild climate change, 3.4 and it will benefit the world.	Pred; Eng (E) Pred; App; Grad Grad; Pred; App Pred; App
4	4.1 Damaging hurricanes, tornadoes, and whatever ... are not clearly linked to the buildup of greenhouse gases 4.2 Increased CO2 worldwide with few exceptions means plants grow better, period. ... 4.3 CO2 is something that plants love ... It's hardly a pollutant at all. 4.4 It's obviously a naturally occurring gas	Contra Grad Eng (C); Judg Cert

Table 9. Key quotes from the CO2 Coalition

CO2 industry exploits the argument that the positive outweighs the negative. By claiming that CO2 is not harmful (1.4), the industry instills doubt towards climate change theories and global warming but provides no evidence. The strategy is to create a threatening future scenario in which climate change

regulations (3.1) will be paid in full by the public. The benefits (1.4, 2.3, 3.2, 3.4, 4.2), therefore, even in the face of mild change, will be higher (3.3).

Due to the difficulty in finding research to support CO₂'s denialist beliefs (2.1), the industry heavily questions the existing contrarian scientific evidence, and insists on the benefits of rising CO₂ levels. The company's personal interest shapes their stance taking, supported by their mission of protecting economic progress and standards of living.

5. Discussion

Reflecting on how an extended presentation of all the key quotes of the DeSmogBlog resource data set would enrich the understanding of the climate change denial debate, it is unlikely to be carried out in a single paper. Nevertheless, owing to the multiple readings of the data, the samples analyzed in this study were selected according to the level of representativity of each of the denialist categories listed in Table 1. This means that generalizations could cautiously be formulated for the purpose of contributing to the heated debate in relation to climate change as well as providing proposals for future research to explore.

With reference to this study's profiled climate denialists, it can be argued that experts or self-proclaimed experts seem to contend that climate change is not a serious problem, or that the effects are often exaggerated. These views especially question the integrity of climate science, even the kind that gets peer reviewed in journal entries, sustaining that it is driven by personal motives. By defending their right to dispute climate change theories, their effort has created a powerful denial machine which runs on generating skepticism.

The organizations represented by the Heartland Institute "that has been at the forefront of denying the scientific evidence for man-made climate change",³⁵ due to their illustrative role as conservative and corporate front groups, speak in the name of a wider interest which, in most cases, has to do with defending the extraction of fossil fuels. They mostly frame the issue of climate change as a natural phenomenon which does not pose any immediate threats, and conversely argue that regulations in favor of climate change intervention could put a stop to personal initiative and economic progress.

What follows is a list of the denial strategies that emerged from the above analysis through which it is possible to identify acts of stance taking:

- Accusations of conspiracy theories. Denialists affirm that conspiracy theories are generated against their right to disagree or ask legitimate questions as a consequence of the failure of

³⁵ DeSmogBlog, "The Heartland Institute" (2018), <https://www.desmogblog.com/heartland-institute>, accessed 20 March 2018.

recognized climate science to produce convincing evidence (see Alexander, Heartland Institute);

- Abuse or misinterpretation of climate change research. In the effort to defend climate change denial, when the accusation of conspiracy theories is ineffective, official research studies are brought in but with a distorted version of the results (see Trump);
- Questionability of climate experts and scientific evidence. The inevitable and inherent uncertainties of climate science research is at the basis of this strategy which is used to encourage denial attitudes among public opinion and diminish trust in mainstream climate science and its scholars (see Nova),³⁶
- Unavoidability of climate emergencies. This attitude is common to all profiles as the main argumentation is based on the repeated natural occurrences of catastrophes recorded in history.

Disseminating doubt is at the very heart of science denial, and by positioning this attitude at a higher or lower level of the denial spectrum is parallel to taking a stance. By identifying patterns of discursive behaviors regarding denial, the present investigation argues that these attitudes can be measured at different intensities and shaped into denial types. The ones described below, informed by Bjornberg et al.'s previous research in this field,³⁷ are the result of this study's analysis:

- Literal denial. Contests any activity of change in terms of global warming and anthropogenic causes;
- Imputability denial. Affirms that climate change can be attributed to other specific causes such as solar activity;
- Unavoidability denial. Acknowledges catastrophic events regarding climate change but expected and unavoidable natural causes are to be blamed;
- Reputability denial. Attacks climate science and the credibility of climate scientists especially on their consensus on the anthropogenic nature of climate change;
- Distortion denial. Fabricates fake information from scientific data resulting in the distortion of truth.

³⁶ See Dunlap, *Climate Change Skepticism*.

³⁷ Bjornberg et al., "Climate and Environmental Science Denial".

6. Conclusion

In this study I have focused on climate change denial strategies and the dialogic achievement of stance on the part of individuals and organizations. The climate denial phenomenon, as discussed in the above sections, can be classified according to types and further clustered under two sets of factors. The first category is expressed by psychological factors which, in this study, are linked to the imputability and unavoidability denial types.³⁸ They induce the rejection of evidence produced by climate science as a form of defense mechanism, often in response to what is perceived as either a problem caused by other forces or an unsolvable predicament. Then there are sociological factors,³⁹ referring to literal, reputability and distortion denial types whereby climate science and climate change research are perceived to be uncomfortable as they demean the defense of anthropocentrism,⁴⁰ private property rights⁴¹ and the more economic-related belief in free market and liberalism.⁴²

An underlying thread runs through this brief portrayal of denial, as mentioned at the very beginning of the investigation, and it is one that requires attention from all those who support climate science and are adamant about posing questions regarding when corporate maneuvers, in their attempt to weaken environmental regulations, will be legally forced to act more responsibly. Indeed, despite the imperfection of climate science, its goals are preferable to the schemes underlying denialist claims; an observation that also brings to the foreground the responsibility of the academic research community in terms of addressing this phenomenon from diverse interdisciplinary perspectives. In other words, climate change research needs to contribute to the work accomplished by DeSmogBlog to debunk the perpetrators of denial, perhaps with a wider and more radical approach that illustrates the life-threatening environmental risks that human beings are exposed to everyday.

³⁸ Holtcamp, “Flavors of Uncertainty”.

³⁹ Steve Rayner, “Uncomfortable Knowledge: The Social Construction of Ignorance in Science and Environmental Policy Discourses”, *Economic and Society*, 41.1 (2012), 107-125.

⁴⁰ Peter J. Jacques, “A General Theory of Climate Denial”, *Global Environmental Politics*, 12.2 (2013), 9-17.

⁴¹ Alex Y. Lo, “The Right to Doubt: Climate-change Scepticism and Asserted Rights to Private Property”, *Environmental Politics*, 23.4 (2014), 549-569.

⁴² Jeremiah Bohr, “The ‘Climatism’ Cartel: Why Climate Change Deniers Oppose Market-based Mitigation Policy”, *Environmental Politics*, 25.5 (2016), 812-830.