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Rational Irrationality in the USA

A Case for Improving Social Rewards to Rationalize the Climate Change Debate

Master thesis

Prague 2017

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Academic Year: 2017

Bibliographic note

KLEŇHA, Jan. *Rational Irrationality in the USA.* 70 p. Master thesis. Prague: Charles University, Faculty of Social Sciences, Institute of International Studies, 2017. Supervisor PhDr. Mgr. et Mgr. Kryštof Kozák, Ph.D.

Abstract

In this thesis, the theory of rational irrationality is used to explore the incentives behind seemingly irrational beliefs held by a large part of the contemporary American society towards anthropogenic climate change. Applying causal analysis, three questions are answered: "is it rationally irrational for people to be indifferent towards climate change?" "Are Americans inherently more likely than others to hold irrational beliefs about global issues such as climate change?" If so, "is this phenomenon rooted in certain values that constitute the American identity?" The author focuses on specific "American values" and uses statistics and recent empirical studies to find correlations and causality between those values and the exhibited behavior of individuals, while discussing its possible causes and implications. The study concludes that the root cause of irresponsibility of the American citizen towards climate change is a lack of social mechanisms rewarding individuals for holding epistemologically accurate beliefs. The author then proposes a set of general measures to be prioritized in order to improve social reward mechanisms in the American society. If implemented, those measures should be able to effectively enforce epistemic rationality in the U.S. political debate, which is desirable especially in the so-called "post-factual" era of Donald Trump´s presidency.

Keywords

Rationality, USA, Rational irrationality, Anthropogenic climate change, Social reward mechanisms, American values, Identity, Crony beliefs, Responsibility, Behavior, Incentives, Beliefs, Biases, Instrumental rationality, Epistemic rationality.

Abstrakt

Diplomová práce se zaměřuje na zkoumání příčin inkoherence mezi názory obyvatel USA a tvrzeními vědecké komunity ohledně existence klimatických změn a významu lidského vlivu na globálním

oteplování. Teorie racionální iracionality je použita v rámci kauzální analýzy tohoto fenoménu. Cílem práce je zodpovědět tři hlavní otázky: „Je pro člověka instrumentálně racionální přehlížet globální oteplování?“ „Jsou Američané více iracionální než jiné národy v tomto ohledu?“ Pokud ano, „vychází tato vlastnost z určitých zakořeněných společenských hodnot utvářejících tzv. americkou identitu?“ Argumentujíce za pozitivní odpovědi na tyto otázky, autor jmenuje pět základních „amerických hodnot“ a hledá korelaci a kauzalitu mezi těmito hodnotami a statistickými výsledky řady empirických studií. Závěrem práce je zjištění, že překvapivě důležitou roli v utváření názorů na globální problémy hraje sociální prostředí jednotlivce v USA, a že jednou z hlavních příčin tohoto fenoménu jsou špatně nastavené „mechanismy sociálních odměn“ ve společnosti. Tyto mechanismy odměňují jedince za instrumentálně racionální chování, které je ale často nezodpovědné k národním a globálním problémům. Autor v závěru navrhuje sadu obecných doporučení, které mají potenciál zvýšit epistemickou racionalitu ve společnosti právě pomocí zdokonalování mechanismů sociálních odměn. Systematická snaha o zvyšování racionality se zdá být v současné době velmi příhodná i s ohledem na společenské dopady takzvané post-faktuální éry prezidentství Donalda Trumpa.

Klíčová slova

Racionalita, Racionální iracionalita, Globální oteplování, Mechanismus sociálních odměn, Americké hodnoty, Identita, Podněty, Tvorba názorů, Chování, Zodpovědnost, Instrumentální racionalita, Epistemická racionalita.

Range of thesis: 70 pages.

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague, May 12, 2017 Jan Kleňha

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Contents

Introduction

"If we could arrange for our peers to judge us solely for the accuracy of our beliefs, than we would have no incentive to believe anything but the truth."

Kevin Simmler

Throughout the course of history, human beings have over and over again encountered situations, in which loyalty to a truth (or a probable truth) becomes an unreasonable position to hold and it is essential to alter (or at least signal altering) one´s own beliefs in order to show strength, appeal to the peers and, in many cases, to survive. It comes intuitive to us, that the chances of gaining social benefits from holding and acting upon certain inaccurate beliefs sometimes out-weigh the expected foreseeable outcomes of holding on to principles, which we rationally believe are the most epistemologically accurate. In fact, these accurate, evidence-based beliefs have been constructed using our biased and imperfect perception processes, and they have been based on often incomplete information, which makes them less reliable. That is why our brains tend to adopt heuristic beliefs that are not necessarily maximally accurate, but expedient. These beliefs are approximations accurate enough to produce desirable expected outcomes.

Depending on the nature of different expected outcomes, we sometimes choose to hold beliefs that are directly opposing any epistemic evidence, but acting upon them is more beneficial for us. A smoker desires to quit smoking while knowing (believing epistemic evidence) that the only way to do so is not to have the next cigarette. He or she chooses to have a cigarette nonetheless, which is an epistemologically irrational decision but it has a higher instrumental value, bringing a more valuable and instant expected outcome at the moment. Even a voter who honestly believes in democracy, may choose not to vote, because the expected outcome (the possibility of his or her ballot making a difference) is much smaller than the expected outcomes of spending the time otherwise. Even if one believes that climate change is an urgent problem so that the most epistemologically rational choice would be to install solar panels or to buy an electric car, he or she often doesn't do so, reasoning (instrumentally) that it is costly and the expected benefits from doing so are much smaller than the expected benefits of spending the extra money otherwise. People, then, excuse these decisions in various ways. In other words, in many situations it is instrumentally rational to be epistemologically irrational.[1] This is a definition of rational irrationality, a theoretical concept that will be applied throughout this paper.

From an evolutionary point of view, due to the rapidly changing social settings we live in, it is surprisingly difficult to assess whether humanity is becoming more rational. We can safely argue,

[1] Bryan Caplan, "Rational irrationality: A Framework for the Neoclassical Behavioral Debate." *Eastern Economic Journal* 26, No. 2 (2000).

however, that the ultimate goal of the advancement of every society is to maximize the number of situations, in which even the most marginal human decisions are based primarily on rational reasoning and the expected outcomes of actions carried out by individuals are rewarded by the society based on its accuracy and ability to survive within the bounds of human morality. This statement by no means tries to eliminate emotions (which are statistically more likely to be irrational but they are necessary for us to have) from the equation, it only implies that the reasons behind emotional and irrational behavior should be better understood and more accurately accommodated into the over-all understanding of every single decision-making process we deploy. This is the topic of the first two chapters of this paper and rational irrationality is the concept that will be explored in depth and provide us with understanding of the core phenomena of human rationality.

When talking about global problems or even existential risks for humanity, many people evoke global warming as the most commonly mentioned example. In this paper, anthropogenic climate change acceptance and denial will be used as a case study, because evidence shows that it is an urgent issue to deal with, it is not as difficult to relate to as it is to some other existential risk, and at the same time, there is a surprisingly wide discrepancy between the factual scientific evidence, political presentation of the problem and willingness of people to act upon it. Global issues, however, consist of a wide variety of problems (tax havens, migration, overpopulation, nuclear armament, wealth disparity, human rights violations, biogenetic risks, artificial intelligence risks etc.) that cannot be effectively dealt with on a national level. If any influential society (American, in our case) manages to substantially raise the public awareness, responsibility and rational compassion towards any of the global issues, it will have a positive spill-over effects on other societies and on the capability of dealing with all the other problems.

Downfall of global issues is that for a reasonably rational person global problems appear too distant in both space and time, too hard to imagine and, even if accepted as urgent, too difficult to measurably impact with one´s own actions. This seems to be the problem rooted in our inherently utilitarian and pragmatic thinking. The application of the academic concept of rational irrationality is based on the premise that it is urgent to build enough will-power and social consensus to deal with global issues effectively, especially in economically and politically important countries such as the US. In order to effectively approach global problems, the vast majority of democratic societies need to be actively advancing their population´s ability to making decisions more rationally in relation to global issues, and not doing the opposite, as seems to be the case at the moment. The root cause of human tendency to be rationally irrational towards climate change is the topic of the third chapter of this paper.

The United States of America is, by many metrics, a country whose roughly 240 years of existence led our world´s advancement in the most effective, rapid, reasonable and sustainable way than any other country´s efforts in history has managed to do (even while at times using questionably means). Of course, such simplification is fragile and even if we agree with the statement, it would be difficult to quantify how much of the advancement was really caused by the birth of the American mentality, US political system or its application of “western” world views etc., and to what extent was the United States only “lucky” to be the society prone to bringing the most disruptive changes, that were about to be brought anyway.

The American influence on the world is undisputable. Considering the recent tendencies of the U.S. politics (most notably the rise of Donald Trump and the early steps taken by Trump administration with all the accompanying phenomena such as a distrust in politics, ideological polarization, disappearance of effective democracy due to special interests, media bias, emotionally driven populism, the fight against political correctness, climate change denial etc.), we seem to live in times when rationality has a great potential to spread, but at times experiences unusual setbacks. It is by no means to say that the rise of Donald Trump is an irrational phenomenon. Some academics argue quite the opposite, but some of its implications seem to be very epistemologically irrational (anthropogenic climate change denial, for example). This notion enforces the urgency of studying the levels of rationality of the US society in a contemporary setting.

Witnessing the rise of both American and global right-wing populism in recent years, it would be reasonable to argue that it is a result of the decreasing ability of people to rationalize the influx of information (internet and social networks), and the media gatekeeper´s[2] tendencies to maximize their own profits by appealing to emotionally charged (and thus statistically less rational) issues that generate higher attention. With this line of reasoning, we can understand that for certain influential actors in the public sphere, the higher epistemic rationality of general public is not the desired outcome. Whether the political and economic interests are indeed the root cause of irrationality in the US public debate or whether it the rational irrationality is rooted in the society in a form of certain inherent properties derived from important aspects of the American identity is a question that needs to be answered. Having more reliable understanding of this issue, the society will be able to more effectively prioritize its resources in the pursuit of increasing rationality in the USA. This question has not yet been thoroughly explored. The roots of irrationality in the American society specifically towards climate change is, therefore, a research area of this paper and the topic of the fourth, final chapter.

It is commonly agreed within the scientific community that there is not enough attention paid to global sustainability. Considering the current directions of U.S. politics, the prospects of rising global responsibility of political bodies is rather diminishing. Moreover, we live in the exceedingly globalized world where many international corporations as ultimately for-profit entities (many of which are American-based and which are acting as extremely rational agents due to their structured, error-proof and goal-oriented decision making processes that lack emotions) play more dominant roles than state governments.[3] I am concerned, that when any government designed to protect citizens from powerful agents led by purely economic interests fail to do so, it is problematic (as it is undermining the voice of the people, effectively advocating for more wealth disparity and incentivizing both politicians and the society to proceed in directions converging from the most optimal social development). In the time of

[2] the term "media gatekeeper" refers to the media bodies in charge of editing the news and prioritizing them, which results in their effective control over the information viewers receive. The term was first used by Robert Park, *The Immigrant Press and Its Control* (New York: Harper & Brothers, 1922). Similar concept was publicized by Noam Chomsky and Edward Herman under the term *Manufacturing consent* in Edward S. Herman and Noam Chomsky, *Manufacturing Consent* (New York: Pantheon Books, 1988).

[3] In 2015, out of 100 largest economic entities, 31 were states and 69 for-profit corporations. In Paul Miller, "Global Justice", *The Guardian*, September 12, 2016, https://www.theguardian.com/business/2016/sep/12/global-justice-now-study-multinational-businesses-walmart-apple-shell (accessed April 25, 2017).

unprecedented global risks that require effective global cooperation and action, this becomes a rather dangerous problem.

Living in the so-called "post-factual age"[4], it is reasonable to expect that Trump´s administration will be even more effective in undermining any tendencies towards more rational debate by using populist rhetoric and enforcing popular biases especially by lowering the quality of information provided to the media, while aligning its political goals more closely with those of purely for-profit entities. Keeping in mind the pessimistic suspicion, that higher rationality and the better decision making of citizens is not a desirable outcome for neither populist governments nor global for-profit entities, one might become legitimately concerned. It seems that the incentives to make people more rational are diminishing while in order to start effectively tackling most of our global issues and risks, we need to proceed in the opposite direction. For our planet to be sustainable, informed, rational and compassionate citizens are necessary. Specific ways how to progress towards this goal, in case of the USA, will be mentioned in the conclusion of this paper.

Research background

In studying the specificity of U.S. society over the last couple of years, I found myself arriving to an assumption that the most effective solution to the irrationality of American citizens (and first-world citizens in general) is to improve the quality of information based on which they are creating their opinions. Since that time, I have been arguing that we can improve the decision-making of American citizens by improving factors that are directly in relation with the information distribution process: less politically polarized media coverage, more thorough fact-checking of political statements, more evidence-based statistics, lowering biases of opinion makers and information from gate-keepers etc. In other words, knowing that we now have more data than ever and there is an increasing amount of empirically proven facts out there, I saw a solution to the problem in improving the means of passing those new pieces of information to citizens in as ideologically undistorted form as possible.

I believed that once people get hard-to-dispute evidence, they will behave as rational agents not only towards own expected benefits, but with a compassion for accuracy, and they become increasingly willing to implement these evidences into their beliefs and their future behavior. Most of my past research in the field of propaganda, persuasion, political advertising and media bias in the USA seemed to only provide proof of this approach. Even when I started doing research for this thesis, I was confident, that the implemented causal analysis will eventually arrive at these conclusions. I believed that especially new digital and social media have the power to subtly alter the increasing political polarization (caused, to certain extent, by opinion "bubbles" they themselves created in the first place) in order to encourage rationality, openness to opposing arguments and willingness to change even the most deep-rooted beliefs when new evidence for the alternative is brought to light. It was not an

[4] Rolf Reber, "Fighting Climate Change in a Post-Factual Age," *Psychology Today*, November 11, 2017, https://www.psychologytoday.com/blog/critical-feeling/201611/fighting-climate-change-in-post-factual-age (accessed March 3, 2017).

unreasonable or naïve assumption and I was far from being alone in thinking that. Considering the effectiveness of this approach, however, it turns out that I might have been wrong.

Epistemic accuracy, truth and evidence are not always the values we ultimately seek for. As Kevin Simmler explains, "to be maximally precise, we don't need our beliefs to be *accurate* so much as we need them to be *expedient*. If a belief is accurate but too complex to act on, it's a liability. That's why we adopt heuristic beliefs: quick and dirty approximations that are accurate enough to produce good outcomes."[5] It seems that researchers often over-estimate human drive to seek the ultimate truth and then alter behavior by its implications.

In my previous reasoning, I under-estimated the power of social reward mechanisms. I underestimated the unfortunate willingness of human brains to rationalize obvious falsehoods with the promise of a valuable enough expected social reward. I under-estimated the amount of beliefs we hold for instrumental reasons (expecting personal benefits) but rationalize them and trick our mind into presenting them as something purely based on our desire for epistemic accuracy. In such settings, the most effective method to improve rationality is not giving people the most accurate and most complete information to make epistemologically accurate decisions upon, but rather to support social reward mechanisms that offer enough instrumental reasons to make these decisions. Ultimately, "if we could arrange for our peers to judge us solely for the accuracy of our beliefs, than we would have no incentive to believe anything but the truth."[6] In the paper, I explore why this is an especially reasonable claim in regards to the U.S. society and the issue of climate change.

The topic of irrationality in decision-making is a problem that, if ever solved, would disrupt the entire fields of political science, sociology, behavioral economy, education and almost any scientific field imaginable. It would also make it much easier to develop predictable and controllable artificial intelligence. It is no wonder that decision making is the cornerstone of every ideological approach that deals with human behavior and, therefore, it is no wonder that there is a plethora of methods, viewpoints and systemic approaches developed to analyze, describe and comprehend such unclear, general topics. As Dale Jamieson notes, "it is difficult to be precise about the role of values in the production of behavior because the relevant literature is both fragmented and underdeveloped. There is a large and sophisticated philosophical literature that centers on conceptual clarity, but with little regard for empirical tractability. This literature has largely been ignored by those working in psychology and the social sciences."[7]

Stating that, I am well aware that it is necessary to pay increased attention to describing methodology of this work as well as setting clear what background I am viewing the issue from, what are the boundaries

[5] Kevin Simmler, "Crony Beliefs", November 2, 2016, http://www.meltingasphalt.com/crony-beliefs/ (accessed 12/16/2016).
[6] Ibid.
[7] Dale Jamieson, "The American Paradox", *Climatic Change* 77 (2006): 97–102, http://ww.hettingern.people.cofc.edu/Environmental_Studies_695_Environmental_Philosophy/Jamieson_American_Paradox.pdf (accessed March 25, 2017).

of my approach and what might be my unconscious biases in this regard. I will also attempt to explain the terminology I will be using throughout the work and the reasons for the choice of all of my sources.

Sources

Due to the facts mentioned above, it is plausible that readers with different academic backgrounds might feel the lack of certain substantial sources that are concerning irrationality, decision making or citizen behavior with regards to U.S. politics. I perceive the large amount of conceptually incoherent sources as a potentially negative aspect of studying such key topics and combining social psychology approaches with contemporary issues of the American and international politics. At the same time, however, I believe that such crossroads are the place where most radical improvements happen and the cross-sectional analyses are exactly the uneasy direction in which academic spheres must proceed in order to be the most effective, innovative and up-to-date.

Therefore, I cite the most important sources from a variety of academic spheres and I tend to prefer recent articles, because I believe that wisdom accumulates over time and less renowned but recent studies are often more accurate and more effectively applicable than 19th century theoretical works of great philosophers, for example. In the third chapter, I am also explaining why I consider the human-related climate change a fact and I elaborate on what are the sources that back up this claim. It is, in fact, an essential claim for the line of reasoning deployed throughout the work. The terms "anthropogenic climate change" and "global warming" are used equivalently in this paper. I also do not deal with the position of global warming on the list of the most urgent existential risks to humanity.[8] For our purposes, anthropogenic climate change is only used as an existing problem that ought to be (and can be) dealt with on a global scale.

In the first two chapters, my reasoning is built upon the combination of five primary sources, occasionally supported or challenged by related secondary sources. For understanding the concepts of decision theory, I will draw from the original article[9] from 1981 where David Lewis introduces the concept of the "causal decision theory". To explain why the previous theory of expected utility is not useful, especially in dealing to existential risks, I use the help of Daniel Kahneman and Amos Tversky and their 1979 work[10] on Prospect Theory, much later summarized in their cornerstone book "Thinking Fast and Slow."[11]

A third primary source is the study "The Myth of a Rational Voter" written in 2007 by Bryan Kaplan, where he applies the basics of economic theory, causal decision theory and game theory concepts into

[8] recent research studies of global priorities (especially those aligned with the Effective Altruism movement) often show, that there are more pressing, underestimated and neglected issues to deal with than global warming.
[9] David Lewis, "Causal Decision Theory," *Australasian Journal of Philosophy* 59 (1981): 5- 30, http://andrewmbailey.com/dkl/Causal_Decision_Theory.pdf (viewed December 12, 2016).
[10] Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision under Risk", *Econometrica* 47, No. 2 (1979): 263-292.
[11] Daniel Kahneman, *Thinking Fast and Slow (*Farrar, Straus and Giroux, 2011).

the reasoning of voters, and introduces the concept of "Rational irrationality".[12] This concept is further supported by Caplan´s three consequential articles[13] discussing the concept. A fourth source is the sequences from the Less Wrong[14] website, from which I draw many inspirations and some of which were recently (2015) composed and published in a slightly controversial book by Eliezer Yudkowsky, "Rationality – From AI to Zombies"[15]. Yudkowsky, a co-founder of Machine Intelligence Research Institute (MIRI), is a leading intellectual figure in the field of both theoretical and applied rationality and in the area of machine learning and artificial general intelligence.

As another primary source, I take the liberty to use the recent and formally non-academic article "Crony beliefs"[16] written by Kevin Simmler on his own website. The article was published on November 4, 2016 and is, at the moment, drawing attention in the field of research. The author, a Philosophy and Computer Science graduate from Berkeley and a Ph.D. Computional Linguisics student at MIT, draws in the article on the concepts of Karl Popper, David Deutch, Robert Kurzban, Thomas Schelling and Jonathan Haidt, making the information academically accurate and relevant. The author introduces the concepts of "merit beliefs" and "crony beliefs", which I deem useful for using in this paper even though these are not yet conventional terms in the scientific community.

In the third chapter, the concept of rational irrationality is applied into the discourse of climate change. Apart from Simmler´s article, studies by Andreas Kyriacou "Rational irrationality and a Group size"[17] and Caplan´s "The Logic of Collective Belief"[18] are used as primary sources. To explain the rational irrationality of human beliefs towards climate change, the 2016 study[19] by Cook & Lewandowski is referred to. In the fourth charter, applying previous findings to the contemporary American debate about climate change, the most recent statistical data from the Pew Research Center and Gallup polls are cited. Solidifying the background of American identity and values, "The American Paradox" [20] by Dale Jamieson as well as a number of classical sources on the origins of American exceptionalism, written by

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[12] Bryan Caplan, *The Myth of the Rational Voter: Why Democracies Choose Bad Policies* (Princeton University Press, 2007), 40.

[13] Bryan Caplan, *Rational Ignorance Versus Rational irrationality* (Fairfax: Center for the Study of Public Choice, George Mason University, 1999), http://highmesa.us/ratirnew.pdf (accessed February 28, 2017).

- "Rational irrationality: A Framework for the Neoclassical Behavioral Debate." *Eastern Economic Journal* 26, No. 2 (2000): 191–211.
- "Rational irrationality and the Microfoundations of Political Failure." *Public Choice* 107 (2001): 311–331.
- "The Logic of Collective Belief." *Rationality and Society* 15 (2003): 218–242.

[14] "Less Wrong - A community blog devoted to refining the art of human racionality", www.lesswrong.com (accessed April 9, 2017).

[15] Eliezer Yudkowsky, "Rationality: From AI to Zombies", *Machine Intelligence Research Institute*, March 5, 2015, https://intelligence.org/rationality-ai-zombies/ (accessed April 9, 2017).

[16] Simmler, "Crony Beliefs".

[17] Andreas Kyriacou, "Rational irrationality and Group Size: The Effect of Biased Beliefs on Individual Contributions Towards Collective Goods", *American Journal of Economics and Sociology* 70, No. 1 (2011): 109-130.

[18] Caplan, "The Logic of Collective Belief," 218–242.

[19] John Cook, Stephan Lewandowski, "Rational irrationality: Modeling Climate Change Belief Polarization Using Bayesian Networks", *Topics in Cognitive Science* 8 (2016): 160–179.

[20] Dale Jamieson, "The American Paradox", *Climatic Change* 77 (2006): 97–102, http://ww.hettingern.people.cofc.edu/Environmental_Studies_695_Environmental_Philosophy/Jamieson_American_Paradox.pdf (accessed March 25, 2017).

Alexis de Tocqueville, Seymour Martin Lipset, Martin Ignatieff, Walter Russell Mead and Allan Bloom are cited.

Methodology and structure

To be consistent and avoid a thematic confusion or even sidelining off topic, I attempt to carefully structure my work into four main chapters divided into sections. The first chapter "Methods of Rationality" summarizes the historical development of decision theory in order to find the most accurate theory of rationality to be applied in the following chapters. The methods of causal analysis are used to explore the very essence of our irrational thinking descending to the very incentives, based on which we assess (consciously or subconsciously) all possible expected values and then how we form our beliefs and choose actions based on such assessment. The first two chapters are mostly theoretical and deal with the causes behind irrationality, especially in cases of large societal and global issues.

In the second chapter, "Rational irrationality", an introduction to terminology used further in the paper is provided, and the concept of rational irrationality is compared and differentiated against other similar concepts (Bounded Rationality, Rational Ignorance, Dysrationalia and Homo Reciprocans). The theory is inspected in depth, especially concerning the following concepts:

- Epistemic rationality v. Instrumental rationality
- Merit beliefs v. Crony beliefs
- Pragmatic values v. Social values.

The third chapter, "Rational irrationality and Climate Change", is structured as a causal analysis as well and the root causes of particularly notable human tendencies to be rationally irrational towards climate change is explored. The particular decisions theories and the theory on rational irrationality are used to reason why the aspect of time and space distance are among the important factors promoting rationally irrational behavior concerning climate change. In the fourth chapter, "Rational irrationality and Climate Change in the USA", previous findings are applied specifically on the U.S society and politics, in regard to climate change. In this part, the root causes of the specificity of the American approach towards global issues are examined.

Consequently, the outcomes of the previous chapters are combined with five specific American values: exceptionalism, religiosity, individualism, conservatism and tradition. Using the methodology of synthesis, explanations are proposed about the reasons for unusually high rational irrationality among the U.S. public. The correlations between the American values, proclaimed beliefs about climate change and the behavior of the control group of Americans are explored, as well as the causality between the extraordinary distrust in scientific evidence, the strength of other worldwide views and the contrary updating of beliefs. In conclusion, some objections to this approach are mentioned. Being aware of other important aspects such as the role of media, populism or corporate interests in the USA, the importance of social reward mechanisms is elaborated on and the specific recommendations on some of

the most effective approaches to accomplish the goal of the US public triggering responsible action to fight global warming are introduced.

Specific examples and scenarios from real-life (as shortly presented in the introduction) are used only when necessary to illustrate the case throughout the paper. I believe in the ability of the reader with his own unique set of experiences to imagine applications of theoretical concepts of behavior and decision-making in real life. To some extent, it is desirable to encourage the reader to construct his or her own scenarios that might be much more accurate than the author´s case studies. The presence of set examples could result in anchoring the specific situation into the individual understanding of the concept and thus lowering the chances of the birth of new, unconventional and potentially highly beneficial implications and connections. Specific recommendations in the conclusion of the thesis will serve as a summary of my ideas of specific concept applications and should serve as a proof of practicality of this theoretical approach.

Now, in order to find out what are the causes of epistemologically irrational behavior (that is exhibited by many people concerning global issues), we will proceed to describe what rationality actually is and how is it constructed.

Chapter 1: The Methods of Rationality

"A belief is only really worthwhile if you could, in principle, be persuaded to believe otherwise. If your retina ended up in the same state regardless of what light entered it, you would be blind."

Eliezer Yudkowsky

1.1 Defining rationality

Rationality is defined as a "quality of being based on or in accordance with reason or logic"[21] or, more specifically, as a "mental state of a person, characterized by beliefs that are coherent and compatible with the person's experience within a given context."[22] Irrationality may be defined as its exact opposite. Intuitively, however, human beings are not capable of behaving as fully rational agents all the time. To understand such situations, many different theories of rationality have been developed trying to make sense of the factors behind irrational behavior.

As was stated in the introduction, rational irrationality is a concept that describes situations in which it is instrumentally rational to be epistemologically irrational. I argue, that anthropogenic climate change is one of these situations, and in the pursuit of making any society epistemologically rational (concerned, aware and compassionate about global sustainability), we need to make epistemologically rational decisions consist of important instrumental values as well, while maintaining two important caveats. First, irrationality can never be completely eliminated among humans and, second, while working towards the ultimately rational outcomes, it is not always the best strategy to be fully rational at every point of the process. The convergence of epistemic and instrumental rationality could be done most effectively by improving social reward mechanisms.

In the first two chapters, the analysis of causes, processes and outcomes of both rational and irrational human decision-making and its subsequent translation into beliefs and behavior patterns will be explored. The goal of the first chapter particularly is to prove that the concept of rational irrationality is a highly applicable concept to be applied to the study of decision-making about global issues. Knowledge of human reasoning processes should lead us to understand, that the incentives provided by different social reward mechanisms are the main reason for irrational behavior of a large part of citizens in most contemporary societies with respect to these global issues.

[21] "Rationality", *English Oxford Living Dictionaries,* https://en.oxforddictionaries.com/definition/rationality (accessed April 19, 2017).
[22] "Rationality", *Business Dictionary*, http://www.businessdictionary.com/definition/rationality.html (accessed April 19, 2017).

1.1.1 The Unbearable lightness of irrationality

The reasons for human irrationality have been at the core of philosophical thinking since early civilization. Many great philosophers tried to find truth and predict the consequences of not behaving rationally, according to this truth. It is evident that irrationality can bring instant joy and promote irresponsibility and lightness, but does it undermine some higher purpose of our existence? In the long term, isn't such lightness unbearable? In the book "Unbearable Lightness of Being"[23], Milan Kundera used this expression in relation to reasoning against the concept of "eternal return" and cyclical understanding of time.

Eternal return is an ancient concept but in the 19th century popularized especially by Friedrich Nietzsche in the book "Thus Spoke Zarathustra"[24] Nietzsche explored what would be the consequences of eternal return and called them *Das Schwerste Gewicht*, "the heaviest weight." Kundera, drawing from the concept of lightness (developed as early as 5th century BC by Parmenides as a differentiation between lightness and darkness[25]) argued that life is linear rather than cyclical, which means that there is no higher burden and duty imposed upon individuals (after death, consequences will not matter) than as a result, the implicated insignificance of all human decisions is unbearable.

This analogy is used as only one of the ideas of a moral dilemma behind rational irrationality - that for every human being, acting rationally to gain the maximal instant social benefits, but irrationally towards global issues and without respect for distant peoples or future generations is easy but irresponsible, insignificant and without higher meaning. It would be, therefore, our moral duty to be compassionate, rational and responsible. Otherwise, our lives would be light, but unbearable.

1.1.2 Normative importance of rationality

The problem of irrationality constitutes an essential case in decision theory, game theory or in a number of economic theories. It is naturally very complicated, maybe impossible, to find an ultimate theory of rationality that predictably encompasses human reasoning in all possible situations and quantifies the probabilities of all possible decisions that can be made with regards to their expected outcomes.

Apart from the use in economics or political science, the normative approach aiming towards developing the ultimate theory of rationality becomes one of the cornerstones of machine learning and artificial intelligence research in the 20th and 21st century, for which the eventual occurrence of a flawless theory of rationality in the future can have immeasurable implications. As Eliezer Yudkowky notes, "In the

[23] Milan Kundera, *The Unbearable Lightness of Being* (New York City: Harper Perennial, 1999).
[24] Friedrich Wilhelm Nietzsche, *Thus Spoke Zarathustra* (Oxford: Oxford World's Classics, 2005).
[25] W. K. C. Guthrie, *A History of Greek Philosophy: Volume 2, The Presocratic Tradition from Parmenides to Democritus* (Cambridge: Cambridge University Press, 1979), 61–62.

absence of a full understanding of decision theory, we risk building autonomous systems whose behavior is erratic or difficult to model."[26]

In order to understand how people make decisions, it is necessary to understand what are the real incentives behind creating beliefs and making decisions based on those beliefs. Therefore, we shall summarize here the basic concepts of decision theory.

1.2 Decision theory

The Stanford Encyclopedia of Philosophy defines decision theory as a theory "concerned with the reasoning underlying an agent's choices, where "agent" stands for an entity, usually an individual person that is capable of deliberation and action."[27] There is a methodological distinction between normative decision theories and descriptive decision theories. Normative theory tries to identify the best decisions to make (decision analysis) and provide methodologies for the most rational decision-making. Descriptive decision theory assumes that human agents are making decisions under some consistent rules, and it tries to rather observe human behavior and describe these rules. I will use both kinds of approaches in this paper, but more effort will be given to applying descriptive decision theories.

We can also divide decision theory into two basic parts: Non-probabilistic decision theory and Bayesian (probabilistic) decision theory. Non-probabilistic decision theory is used in cases where an agent is faced with a problem and makes a decision under uncertainty, but does not consider the probability of different outcomes. It is an approach often applied in mathematics and other exact sciences and it operates three possible approaches: max-max (risk seeking) approach, max-min (risk averse) approach and min-max regret (risk neutral) approach. A classical one-shot prisoner´s dilemma is an example of its useful application from the field of game theory.

Even though some rationalists[28] make the case for the non-probabilistic theory to be used in explaining social decision-making, people encounter hardly any situations where it would be logical not to count the probability of positive and negative effects on our decisions, especially with regards to national, societal and global problems. Therefore, I will follow the concepts of probabilistic decision theory in this chapter.

[26] Eliezer Yudkowsky, „Coherent Extrapolated Volition", *Machine Intelligence Research Institute*, https://intelligence.org/files/CEV.pdf, quoted from wiki.lesswrong.com (accessed April 19, 2017).
[27] "Decision Theory", *Stanford Encyclopedia of Philosophy*, Dec. 15, 2015, https://plato.stanford.edu/entries/decision-theory/ (accessed April 19, 2017).
[28] Marcello Basili and Carlo Zappia, "Probabilistic versus Non-probabilistic Decision Making: Savage, Shackle and Beyond," *University of Siena Economics, Working Paper No. 403* (2014), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=480763 (accessed April 19, 2017).

1.2.1 Expected utility theory and neoclassical economy

The ideas behind probabilistic decision theory were promoted and popularized by Blaise Pascal in his book *Pensées*, published in 1670.[29] His notion of *expected value* became essential for the theory and, basing his reasoning on objective probabilities, Pascal introduced the famous example of decision making based on expected utilities: Pascal´s wager.[30] Even though Pascal´s wager has been outdated and mathematically disproven for a long time (infinite numbers were improperly used, objective rather than subjective probabilities were implied etc.), it constituted a great milestone in decision making.

Up to this day, neoclassical economical approaches are based on the expected utility theory. The downfall of this method is the fact that considers human beings as completely economically reasoning agents, which is incorrect. Daniel Kahneman in his book *Thinking Fast and Slow*, the essential piece of literature about scientific approach to rationality, summarizes the false presumption of neoclassical economy by quoting the economist Bruno Frey that "The agent of economic theory is rational, selfish and his tastes do not change"[31] The scientific and academic community has been, however, consistent about the fact that people are not rational all the time nor are they completely utilitarian and pragmatic agents, which dispels the accuracy of this theory.

1.2.2 Theory of subjective probability

The theory of subjective probability (based on subjective expected utility) is based on the value of economic opportunity subjectively perceived by an individual decision maker in the situation of risk. The theory was famously promoted by L. J. Savage in 1954 in his study *The Foundations of Statistics*[32], but its core presumptions existed at least since 1738, when Daniel Bernoulli published a paper titled "Exposition of a New Theory on the Measurement Risk."[33] Here, he used the famous St. Petersburg paradox[34] to dispel the accuracy of expected utility theory. In the 1950´s, Savage (accompanied by psychologists such as John von Neumann, Frank Ramsey or Bruno de Finetti) constructed the theory by combining personal utility and subjective probability in the equation.

Subjective probability theory reflects heavily on the subject´s opinions and experiences in the past, and therefore the subjectively assigned probabilities contain a high degree of personal bias. A suitable example is the repeated coin toss, when at the beginning, a person accurately assigns a 50% probability of the coin landing heads up, but if the coins lands tails up 10x in a row, the player tends to assign a higher than 50% probability of the next toss landing heads up.

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[29] "Pascal´s Wager", *Stanford Encyclopedia of Philosophy*, May 6, 2012, https://plato.stanford.edu/entries/pascal-wager/ (accessed April 19, 2017).
[30] "The uncertainty of the gain is proportioned to the certainty of the stake according to the proportion of the chances of gain and loss," Ibid.
[31] The author citing the economist Bruno Frey in Kahneman, "Thinking Fast and Slow".
[32] Leonard J. Savage, *The Foundations of Statistics* (New York, Wiley: 1954).
[33] Daniel Bernoulli, "Exposition of a New Theory on the Measurement of Risk," *Econometrica* 22, No. 1 (January 1954): 23-36, http://www.jstor.org/stable/1909829 (accessed February 28, 2017).
[34] Ibid.

Unfortunately, the theory of subjective probability becomes increasingly inaccurate while approaching large, distant global issues such as climate change (whose outcomes are nearly impossible for an individual to mentally replicate and therefore she is suspicious of the outcomes), As Kirkpatrick and Epstein quote in their research[35], "two equally improbable events evoked different levels of suspiciousness depending, presumably, on the number of ways in which the outcomes could be mentally replicated."[36] When it becomes harder to mentally replicate the possible outcomes of a scenario, the error of judgment grows.

1.2.3 Prospect theory

In 1979, Daniel Kahneman and Amos Tversky came up with the prospect theory, which is even less based on rational presuppositions of how people manage risk and uncertainty and more based on emotional psychological and social aspects of such decision-making. "Kahneman and Tversky have found three regularities in actual human decision-making:

1. Losses loom higher than gains,
2. Persons focus more on change in their utility states than they focus on absolute utilities,
3. The estimation of subjective probabilities is severely biased by anchoring."[37]

This theory is being widely used and referred to up to this day, but with an advancing psychological research of human biases, it becomes evident that there are many more occasions when people make decisions irrationally and additional explanations for these events need to be postulated. This became evident when scientists tried to mathematically formulate the most flawless general decision-making strategies in order to apply them to game-playing algorithms and general artificial intelligence agents.

1.2.4 Causal decision theory

In 1981, Allan Gibbard and William Harper came up with a mathematical background for the evidential decision theory, which advises rational agents to choose the action that provides the best expectations for the outcome. In the same year, David Lewis[38] formulated a contrasting causal decision theory, which quickly appeared to be more relevant, but not perfect, nonetheless. The causal decision theory is being examined especially in the game theory and computational sciences, since it applies more to the mathematical representations of decisions than to scenarios we encounter on a daily basis. According to the Stanford Encyclopedia of Philosophy:

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[35] Lee A. Kirkpatrick and Seymour Epstein, "Cognitive-Experiential Self-Theory and Subjective Probability: Further Evidence for Two Conceptual Systems," *Journal of Personality and Social Psychology* 63, No. 4 (1992): 534-544.
[36] C. Miller et al., "When a coincidence is suspicious: The role of mental simulation," *Journal of Personality and Social Psychology 57* (1989): 581-589.
[37] Jacob Rub, „Decision Theory – Renewing the Empirical Study of Economic Behavior*," State University of Moldova* (2014), http://studiamsu.eu/wp-content/uploads/21.-p.176-183.pdf (accessed February 28, 2017).
[38] Lewis, "Causal decision theory."

> "Causal decision theory adopts principles of rational choice that attend to an act's consequences. It maintains that an account of rational choice must use causality to identify the considerations that make a choice rational."[39]

However, even this theory has since its birth been countered by cases, in which it would fail to provide the best outcome, most notably the Newcomb´s paradox. It is a widely discussed philosophical problem, which was formulated by William Newcomb but first published in 1969 by Robert Nozick.[40] I will shortly elaborate on this problem, since it´s outcomes are important for understanding the occasional setbacks of being rational. The problem can be formulated the following way:

> There are two closed boxes, A and B. A contains $1,000. B contains either nothing or $1 million. An agent has two options: take both boxes or take box B only. She can keep the contents of the box/boxes she takes, and her aim is to get the most money. The catch is, that the test was set up by a super-intelligent agent, who has already made a prediction about what she will choose. If the super-intelligent agent´s prediction was that she would take both boxes, box B would be empty. If the prediction was that she would take B only, $1 million is in the box. The super-intelligence hasn't made a mistake in its prediction since it started this game.[41]

1.2.5 Other decision theories and the regret of rationality

According to the causal decision theory, it is rational to take both boxes, even though it is likely that the agent ends up with only $1,000; the rule only rewards an irrational decision, but at the point of making the decision, it is already too late to do anything about it. As Yudkowsky summarizes an important caveat, "it is agreed among causal decision theorists that if you have the power to pre-commit yourself to take one box, in Newcomb's Problem, then you should do so. If you can pre-commit yourself before the super-intelligent agent examines you; then you are directly causing box B to be filled."[42] There has been a number of new decision theories that try to deal with similar paradoxes, most notably timeless decision theory (TDT) and updateless decision theory (UDT), but I consider their examination irrelevant to this paper.

The purpose of this summary of decision theories is to point out that in order to perfect rationality, it is necessary to first develop an all-encompassing decision theory, the task which no one has yet been able

[39] "Causal Decision Theory", *Stanford Encyclopedia of Philosophy*, https://plato.stanford.edu/entries/decision-causal/ (accessed February 28, 2017).
[40] Robert Nozick, "Newcomb´s Problem and Two Principles of Choice" in *Essays in Honor of Carl G. Hempel* (Reidel, 1969), 114-146.
[41] "Newcomb´s Problem Divides Philosophers," *The Guardian*, November 28, 2016, https://www.theguardian.com/science/alexs-adventures-in-numberland/2016/nov/28/newcombs-problem-divides-philosophers-which-side-are-you-on (accessed February 28, 2017).
[42] Eliezer Yudkowsky, „Newcomb´s Problem and Regret of Rationality*," LessWrong,* paraphrased from "Paradoxes of Rationality and Cooperation" (1985), http://lesswrong.com/lw/nc/newcombs_problem_and_regret_of_rationality/ (accessed February 28, 2017).

to do. Therefore, it is necessary to work with an excessive amount of human perception and reasoning biases and an incomplete understanding of them. Even more importantly, however, the causal decision theory and rationality paradoxes such as the Newcomb´s problem to a notable extent prove a worrisome fact, which we might already intuitively know from our every-day conscious experience: even if we are completely rational agents, in some situations behaving irrationally can be statistically advantageous.

Chapter 2: Rational Irrationality

"Rational irrationality describes a situation where it is instrumentally rational to be epistemologically irrational."

Bryan Kaplan

Rational irrationality is a concept that has been developed by Bryan Caplan in a series of articles[43] and later summarized and promoted in the 2007 study "*The Myth of the Rational Voter: Why Democracies Choose Bad Policies*."[44] In this theory, Caplan approaches rationality as a tradable public good and attempts to use the new model to explain why beliefs (especially about politics and religion) often consist of a large systematic bias and, apart from basing their beliefs on a small amount of information, people also exhibit irrationally high certainty about those beliefs.

As Caplan notes, "A peculiar feature of beliefs about politics, religion, etc. is that the private repercussions of error are virtually nonexistent, setting the private cost of irrationality at zero; it is therefore in these areas that irrational views are most apparent"[45] In other words, it is not that the person deliberately chooses to believe something that he or she knows not to be true, but rather that when there are no losses associated with being irrational, the person chooses not to "invest" (his or her time and efforts) into conducting an assessment of evidence in order to be more rational. People simply allow themselves to be more easily influenced by emotional appeals or cognitive biases, even if they know that those biases likely influence their own reasoning.

There are other academics who talk about *instrumental irrationality*[46] or *strategic irrationality*[47]. For the purposes of this paper, I consider these concepts to be identical to rational irrationality. Here, it is important to compare and define rational irrationality against a couple of other similar but not identical concepts, namely *rational ignorance, bounded rationality, dysrationalia* and the concept of *homo reciprocans.*

[43] Bryan Caplan´s articles "Rational Ignorance Versus Rational irrationality","Rational irrationality: A Framework for the Neoclassical Behavioral Debate","Rational irrationality and the Microfoundations of Political Failure" and "The Logic of Collective Belief."
[44] Caplan, "The Myth of the Rational Voter".
[45] Caplan, „Rational Ignorance vs Rational irrationality", abstract.
[46] Michael Huemer, In Praise of Passivity, *Studia Humana* 1, No. 2 (2012): 17, http://studiahumana.com/pliki/wydania/In%20Praise%20of%20Passivity.pdf (accessed May 1, 2017).
[47] e.g. Thomas Schelling, *The Strategy of Conflict* (Cambridge: Harvard University Press, 1960).

2.1 Rational irrationality v. rational ignorance

Rational ignorance is similar to the theory of bounded rationality, but it has been developed four decades earlier. The theory of rational ignorance was introduced by Anthony Downs in 1957[48] to explain why voters know surprisingly little about relatively important issues, stating that "when the expected benefits of information are small relative to the costs (as they almost always will be in an election), people buy little information."[49]

As it is further explained by Donald Wittman, "scarcity of information increases the expected absolute magnitude of your mistakes, but does not *bias* your estimates or prompt you to treat noise as if it were knowledge. An important implication is that even *rational ignorance* is perfectly consistent with rational expectations."[50] Interestingly, in those cases it seems that voters' minimal purchase of political information makes large mistakes likely to happen, but these are not mistakes systematically biased in one direction. Moreover, "There is also no reason for a rationally ignorant individual to be dogmatic, conditioning his beliefs on logically irrelevant factors to reduce his subjective degree of uncertainty. A rationally ignorant person knows his estimates are imprecise, acknowledging that it is likely that his uninformed opinion is wrong."[51] This is an important distinction, because the theory of Rational Ignorance becomes inaccurate when people proactively enforce their irrational beliefs even when they know that those beliefs are likely to contrast existing factual evidence.

2.2 Rational irrationality v. bounded rationality

The theory of bounded rationality,[52] as another important theory to define our approach was coined already in the 1950´s by Herbert A. Simon, who claimed that "individuals do not seek to maximize their benefit from a particular course of action since they cannot assimilate and digest all the information that would be needed to do such a thing. Not only can they not get access to all the information required, but even if they could, their minds would be unable to process it properly. The human mind necessarily restricts itself." [53]

According to this approach, our rationality is bounded by our cognitive limits, so even if we decided to become rational, we would not be fully able to. The theory has been substantially developed in the late 20th century especially by behavioral economists and the theory of rational irrationality is in accordance

[48] Anthony Downs, *An Economic Theory of Democracy (*New York: Harper, 1957).

[49] Ibid.

[50] Donald Wittman, "Why Democracies Produce Efficient Results," *Journal of Political Economy* (December 1989): 1395-1424.

[51] Caplan, "Rational irrationality vs. Rational Ignorance."

[52] Daniel Kahneman, "A Perspective on Judgment and Choice – Mapping Bounded Rationality," *Princeton University*, http://choo.fis.utoronto.ca/FIS/courses/lis2149/kahneman.NobelPrize.pdf (accessed February 28, 2017).

[53] "Herbert Simon", *The Economist*, http://www.economist.com/node/13350892 (accessed April 8, 2017), referring to Simon Herbert, "A Behavioral Model of Rational Choice", in *Models of Man, Social and Rational: Mathematical Essays on Rational Human Behavior in a Social Setting* (New York: Wiley, 1957).

with bounded rationality and it is built on the concepts of this theory. The theory of rational irrationality is more elaborate in approaching other limits of rationality as well, such as in situations when there is clear evidence for certain individual action which, however, does not offer any expected benefits.

2.3 Rational irrationality v. dysrationalia

A similar psychological concept is called *dysrationalia*. According to Stanovich who introduced it in 1997, "dysrationalia is defined as inability to think and behave rationally despite adequate intelligence."[54] According to the theory, there is not a lineal correlation between IQ and RQ (rational quotient) and due to certain biases, people with a higher IQ in some cases tend to be even less rational. Similar to the theory of rational irrationality, as we will see later, dysrationalia claims that people tend to signal high moral values, but they do not act upon them in reality. This phenomenon is called *moral cheering* and the term will be occasionally used throughout the paper.

According to Lucius Caviola, moral cheering is mostly based on emotions and people resort to moral cheering when publicly expressing morality doesn't incur any cost and it may bring social benefits (approval of your peers) while not demanding any effortful actions.[55] As we will see in the third chapter, this incoherence between claims and actions is actually one of the root causes of irrationality in the American climate change debate. Caviola claims that this problem can be solved by *spreading the knowledge of biases, de-biasing* and *nudging*[56] (all of which should cause social reward mechanisms to improve), which are conclusions fully coherent with conclusions of this paper. Moral cheering and its implications are very important in the theory of rational irrationality as well, but dysrationalia is a psychological concept concerning the relationship between rationality and intelligence and, therefore, it is not a more accurate concept for us to apply to the social phenomenon of American irrationality.

2.4 Homo reciprocans

The last related concept comes from the field of economics and approaches humans as "homo reciprocans". As already Adam Smith observed, "the proper institutional framework can induce self-interested agents to serve the interest of others."[57] Samuel Bowles argues that in the economic theory, there is a concept of homo reciprocans which, as opposed to homo economicus, describes the agent as follows: "homo reciprocans is neither the selfless altruist of utopian theory, nor the selfish hedonist of neoclassical economics. Rather, he is a conditional cooperator whose penchant for reciprocity can be

[54] Keith E. Stanovich, "Dysrationalia: A new specific learning disability." *Journal of Learning Disabilities* 26, Vol. 8 (1993): 501–515.
[55] Lucius Caviola, "The Psychological Cost of Moral Progress", *EAGx Conference*, September 4, 2015, University of Basel, lecture accessible at https://youtu.be/NqbH3mIRFu0 (accessed March 29, 2017).
[56] Ibid.
[57] Samuel Bowles et al., "Homo reciprocans: A Research Initiative on the Origins, Dimensions, and Policy Implications of Reciprocal Fairness", *University of Massachusetts*, June 7, 1997, http://www.umass.edu/preferen/gintis/homo.pdf (accessed March 3, 2017).

elicited under the proper circumstances."[58] Rational irrationality is completely in agreement with this concept, claiming that the social mechanisms creating positive incentives by rewarding cooperation and compassion are the most important aspects behind rational behavior as well.

2.5 Incentives in the theory of rational irrationality

Caplan explains, that "individuals have well-ordered and stable preferences over beliefs as well as their personal wealth. More specifically, they care about their wealth but also gain utility from holding biased beliefs".[59] Later on, I will argue why people will not always assign the highest importance to their own wealth nor always act in purely utilitarian manners and therefore they can be intrinsically altruistic. Meanwhile, as Kyriacou explains in his assessment of rational irrationality, "while individuals are assumed to have biased beliefs, they are also assumed to have unbiased estimates of the price of irrationality or, to put it another way, they have rational expectations about the consequences of irrational action. This is what makes the irrationality rational."[60]

Caplan, moreover, calls the factor that describes to what extent people are willing to allow themselves to be irrational a *private impact*. If the private impact is close to zero, people have no incentive to choose not to be irrational. As he continues, "the quality of agent´s estimates depends on the "*two* cognitive margins: the quantity of information they acquire, and how rationally they *process* the information they do have,"[61] shown in the following diagram.

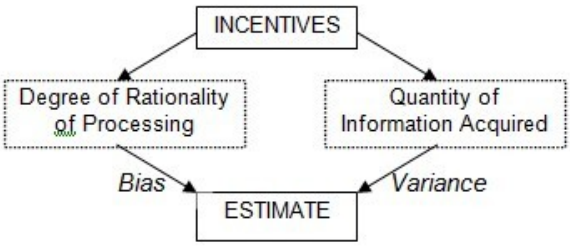

Figure 1: Incentives and Estimation [61]

2.5.1 Epistemic and instrumental rationality

For the purpose of this paper, the most important part of the concept is, how our rationality is formed by our incentives to be (or not to be) rational. As the theory claims, incentives are at the heart of every decision making process. Based on the combination of incentives and cognitive margins (as seen in a diagram) the concept of rational irrationality differentiates two kinds of rationality:

[58] Ibid.
[59] Kyriacou, „Rational irrationality and Group Size," 110.
[60] Ibid., 110.
[61] Caplan, "Rational irrationality vs. Rational Ignorance."

- Epistemic rationality - accepting new evidence and forming beliefs aligned with this evidence
- Instrumental rationality - choosing the most effective ways to reach one's goals.

The idea that people can either behave rationally (instrumentally, in a selfish, utilitarian manner) towards their own goals or rationally (altruistically, pragmatically) towards the epistemic truths based on provided evidence, is relatively instinctive and commonly accepted in academic literature. For illustration, the following table summarizes some of the concepts that fall in line with this reasoning (even if consisting of notable distinctions):

Author	Concept/theory	Personal benefit as incentive	Truth as incentive	Year, source
William James	Pragmatic theory of truth	Associated reasoning	True reasoning	1907[62]
Petty, Cacioppo	Elaboration likelihood model	Peripheral path	Central path	1986[63]
Bryan Caplan	Rational irrationality	Instrumental rationality	Epistemic rationality	1999[64]
Keith Stanovich	Dual process theory	System 1	System 2	2000[65]
Kevin Simmler	Crony beliefs theory	Crony Beliefs	Merit beliefs	2016[66]

The topic of human decision-making is studied in almost every scientific field, so it would be impossible to provide a comprehensive list of academic work about decision-making factors and conscious or sub-conscious incentives that influence our beliefs, nor is it a purpose of this paper. As we can see, however, many theories lead us to understand that incentives lie at the core of the problem. More precisely, it is possible to make people more rational if they have an incentive to be epistemologically rational, but just don't have enough information, their decision-making processes are biased or they do not reason far enough into the future. But what if people have incentives to be only instrumentally rational in some cases? Here, the only effective approach is to alter the incentives in the first place.

2.5.2 Criticism of rational irrationality

There has been a number of studies on epistemic and instrumental rationality some of them criticizing the very essence of distinction between those two kinds of rationality. Most notable is probably Thomas

[62] William James, "Pragmatism: A New Name for Some Old Ways of Thinking" in *Pragmatism's Conception of Truth* (1907).
[63] Petty, Cacioppo, „Elaboration likelihood model of persuasion", *Ohio State University*, http://www.psy.ohio-state.edu/petty/documents/1986ADVANCESsPettyCacioppo.pdf (accessed March 5, 2017)
[64] Caplan, „Rational irrationality."
[65] Keith Stanovich and R. F. West, "Individual difference in reasoning: implications for the rationality debate?" *Behavioural and Brain Sciences* 23 (2000): 645–726.
[66] Simmler, „Crony Beliefs".

Kelly´s 2003 study[67] of this phenomenon. He introduces the instrumentalist conception of epistemic rationality, saying that "epistemic rationality is a species of instrumental rationality; it is an instrumental rationality in the service of one's cognitive or epistemic goals."[68] I mention this critique to provide the reader with the understanding of the inherent problem of categorizing rationality: even if we think we behave epistemologically rational and have completely altruistic, non-selfish aims to actively act upon, those beliefs might have been (unintentionally or subconsciously) constructed based on instrumental incentives. To explain the subtle distinction in the nature of those two rationalities, I use the concept of dual function of beliefs.

2.6 Merit and crony beliefs

An early advocate for this argument of dual function of beliefs was Robin Hanson, who claimed that beliefs are like clothes, because they can have both instrumental and social values.[69] In order to explain why this might be the case, I use Kevin Simmler´s article "Crony beliefs" [70], in which he basically states that epistemic rationality is composed of "merit beliefs", while instrumental rationality is built upon "crony beliefs". Merit beliefs help us navigate the world, while crony beliefs help us look good. In this regard, crony beliefs are very often motivated by the social rewards we expect to gain from holding (and showing or acting upon) them. The following table (figure 2) shows different distinctions between merit and crony beliefs.

	Merit Beliefs vs.	**Crony Beliefs**
purpose, agenda	Modeling & navigating the world	Posturing, making impressions
output	Decisions, actions	Words, lip service
reward mechanism	Accurate beliefs → effective actions	Socially-useful beliefs → favorable impressions
moral color	Good faith, legitimate, truth-seeking	Bad faith, corrupt, manipulative
attitude toward beliefs	Pragmatic, critical	Protective, sacred
theory	Rationality, empiricism, Less Wrong, Karl Popper, David Deutsch (+many others)	Strategic irrationality, Thomas Schelling, Robert Trivers, Robert Kurzban, Jonathan Haidt
hallmarks	Calibrated confidence; desire for criticism; dispassion	Overconfidence; defensiveness; confirmation bias; strong emotions
archetypes	Scientist, Engineer	Politician, Lawyer

Figure 2: Merit and Crony Beliefs[70]

[67] Thomas Kelly, "Epistemic Rationality as Instrumental Rationality: A Critique," *Philosophy and Phenomenological Research* 66, No. 3 (May 2003), www.princeton.edu/~tkelly/erair.pdf (accessed March 1, 2017).
[68] Ibid., 2.
[69] Robin Hanson, "Are Beliefs Like Clothes?", George Mason University, 1997, mason.gmu.edu/~rhanson/belieflikeclothes.html (accessed March 29, 2017).
[70] Simmler, „Crony Beliefs".

2.7 Pragmatic and social value

Those beliefs function as representatives of different values. As Steven Pinker says, "people are embraced or condemned according to their beliefs, so one function of the mind may be to hold beliefs that bring the belief-holder the greatest number of allies, protectors, or disciples, rather than beliefs that are most likely to be true. Religious and ideological beliefs are obvious examples."[71] It is rather important to mention, that any given belief can serve both pragmatic and social purposes at the same time, and that merit beliefs are only statistically more likely to be true (evidence-based, epistemologically accurate), but it is not always so. The *figure 3* hints what values different beliefs have for us. Simmler claims, that we hold merit beliefs because their expected pragmatic value far outstrips its expected social value, while for crony beliefs, it is vice versa.

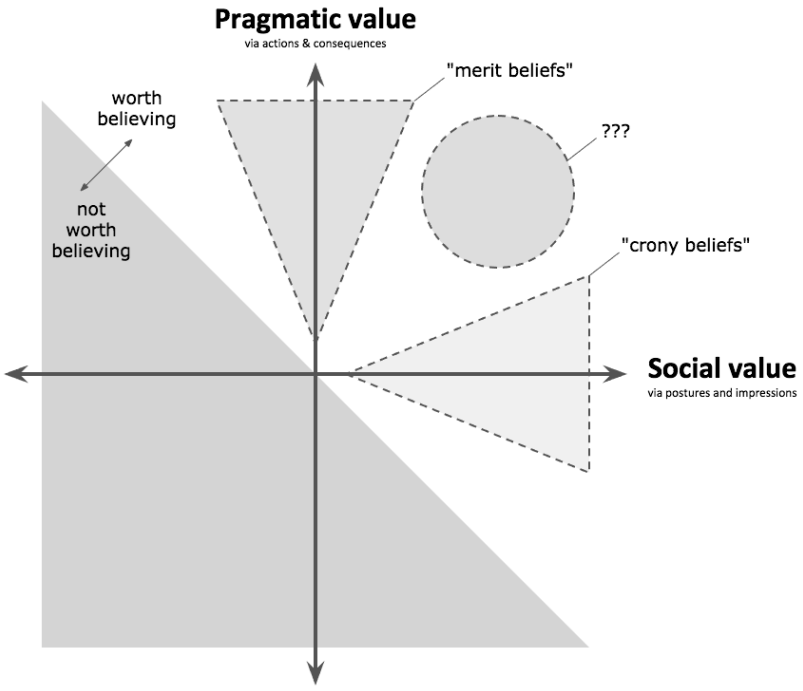

Figure 3: Pragmatic and social value[70]

It is important to understand, that our crony beliefs often need to "mimic" the behavior of merit beliefs in order to survive and not evoke negative psychological responses of our brain such as "cognitive dissonance"[72]. It is, therefore, difficult to assess whether a certain merit belief we think we hold is not actually based on instrumental social incentives. The important possible distinction is, that crony beliefs

[71] Steven Pinker, *Language, Cognition, and Human Nature: Selected Articles* (Oxford: Oxford University Press, 2013).

[72] "A psychological conflict resulting from incongruous beliefs and attitudes held simultaneously." From "Cognitive Dissonance", *Merriam-Webster Dictionary*, www.merriam-webster.com (accessed April 25, 2017).

need to be protected from criticism, while merit beliefs need to be criticized and confronted in order to be the most effective (have the highest pragmatic value, that help us model the world as accurately as possible). If crony beliefs are challenged, they evoke emotional and irrational response. Crony beliefs are more likely to be abstract and difficult to prove or act upon while the person is irrationally overconfident and conspicuous about them.[73]

2.8 Chapter conclusions

The essential lesson here is this: what makes for a belief is *how we're rewarded for it*.[74] What kind of value it has for us. For holding a merit belief, we are rewarded by gaining pragmatic values – for instance being able to navigate in the world more accurately and effectively. For holding a crony belief, we are rewarded by gaining social values – making good impressions, being respected by a community etc. In essence, reward mechanisms are in the core of every human decision making and rational irrationality is the most effective concept leading us by making three conceptual distinctions: epistemic v. instrumental rationality, merit v. crony beliefs and pragmatic v. social values expected to be gained from holding those beliefs. Understanding this terminology, we can effectively enter the debate about rationality towards climate change.

The aim of the following chapter is to find out, if it is some deeply rooted aspect of human rationality that contributes to the difficulty of coordination towards an effective action to fight climate change. Establishing more factual evidence that improving social reward mechanisms is likely to be the most effective way to go, we as humanity (or we as actors actively involved in our society, respectively) could more effectively prioritize our efforts to progress towards more widespread rationality. Specifically, a variety of foundations, initiatives or social impact investors would be more likely to donate/invest in projects improving social rewards mechanisms by education people about cognitive biases rather than to projects de-biasing media coverage, for instance. But does this logic apply to climate change?

To find out if social reward mechanisms are indeed the core issue in the climate change debate, we shall start by assessing our own individual beliefs we hold. No matter if we believe in the existence of an anthropogenic, human-related climate change or not, when we follow the logic of rational irrationality, we need to find out answers to those four questions:

- Is my belief about climate change likely to be a merit belief of a crony belief?
- What social and pragmatic values I expect to gain by holding this belief?
- How am I actually rewarded for holding this belief and for acting upon it?
- How rationally do I update this belief when confronted with new evidence?

[73] Simmler, „Crony beliefs“, 8.
[74] Simmler, „Crony beliefs“, 9.

Chapter 3: Rational Irrationality and Climate Change

"We are the last generation that can take steps to avoid the worst impacts of climate change. Future generations will judge us harshly if we fail to uphold our moral and historical responsibilities."

Ban Ki-moon, Secretary General, UN

"We are doomed to respond irrationally to climate change. Our biases are systematic. The position of the median voter on this issue is likely to be far from the optimal point."

Matthew Humphrey

3.1 Social reward mechanisms and climate change

Answering individually the questions from previous chapter, we arrive to the inherent problem of beliefs about climate change: <u>believing, that climate change is man-made (and human conscious action needs to be taken to mitigate it) has almost no pragmatic value for us</u> – it doesn't help us in any instrumental way to understand or navigate in the world better. Even if we knew the truth, we could not expect any real rewards for knowing it (except maybe that we could definitively decide to move away from a coast or invest in renewable energy industry), so it is often not instrumentally rational for us to invest our time and mental energy into finding out the evidence. As Simmler says in regards to climate change, "there are no actions we can take whose payoffs (for us as individuals) depend on whether our beliefs are true or false."[75]

The exception are those of us, to whom the epistemic knowledge brings enough value in the form of a psychological satisfaction, while acting in accordance with this knowledge brings the satisfaction by evoking feelings of higher responsibility to the planet or any higher instance (God) or by being more accurately aligned with a set of own moral values. The percentage of population capable of acting upon merit beliefs for those reasons is unfortunately smaller that we would expect (definitely too small to have a decisive political impact). I assume this is so precisely due to the fact, that many beliefs we perceive as merit beliefs (altruistic, non-selfish) are actually crony beliefs that only mimic them, so even our brain cannot recognize their true intent. In fact, one might pay increased attention to being always true to own moral values, only to subconsciously signal to his or her peers own reliability and virtuousness in order to be accepted of move upward in the desired society.

[75] Simmler, „Crony beliefs", 10.

In essence, we can see that even if the anthropogenic climate change was proven beyond doubt, our individual knowledge of it would be too inapplicable to use in a pragmatic way, so our position on this issue are, by nature, likely to be crony beliefs. Answering the question “what value I expect from holding it?”, we reasoned that the most values we can expect are coming from our peers, so our beliefs are likely to have an expected social value. Both camps (named “activists” and “deniers” in the following graphics, for simplification) are likely to answer on how they rewarded for holding their beliefs, that rather than gaining material or financial advantages, they are rewarded in a form of psychological or social values, so the expected social rewards are the decisive factor for holding beliefs about climate change in one way or another.

Keeping in mind all of the above, I enhanced in the previous graph to suggest, where the beliefs of two prototypes of ambivalent actors (activist and denier) are positioned and where they should be positioned in case the scientific evidence proves beyond reasonable doubt, that climate change is human-related and that individual action (by personal sustainability, vote, activism, demanding institution action etc.) is necessary to be taken. Considering that 95% of scientific community claims that such scientific evidence already exists, the direction from black markers (current state) towards grey markers (ideal state) is the direction in which our belief reward mechanisms need to progress:

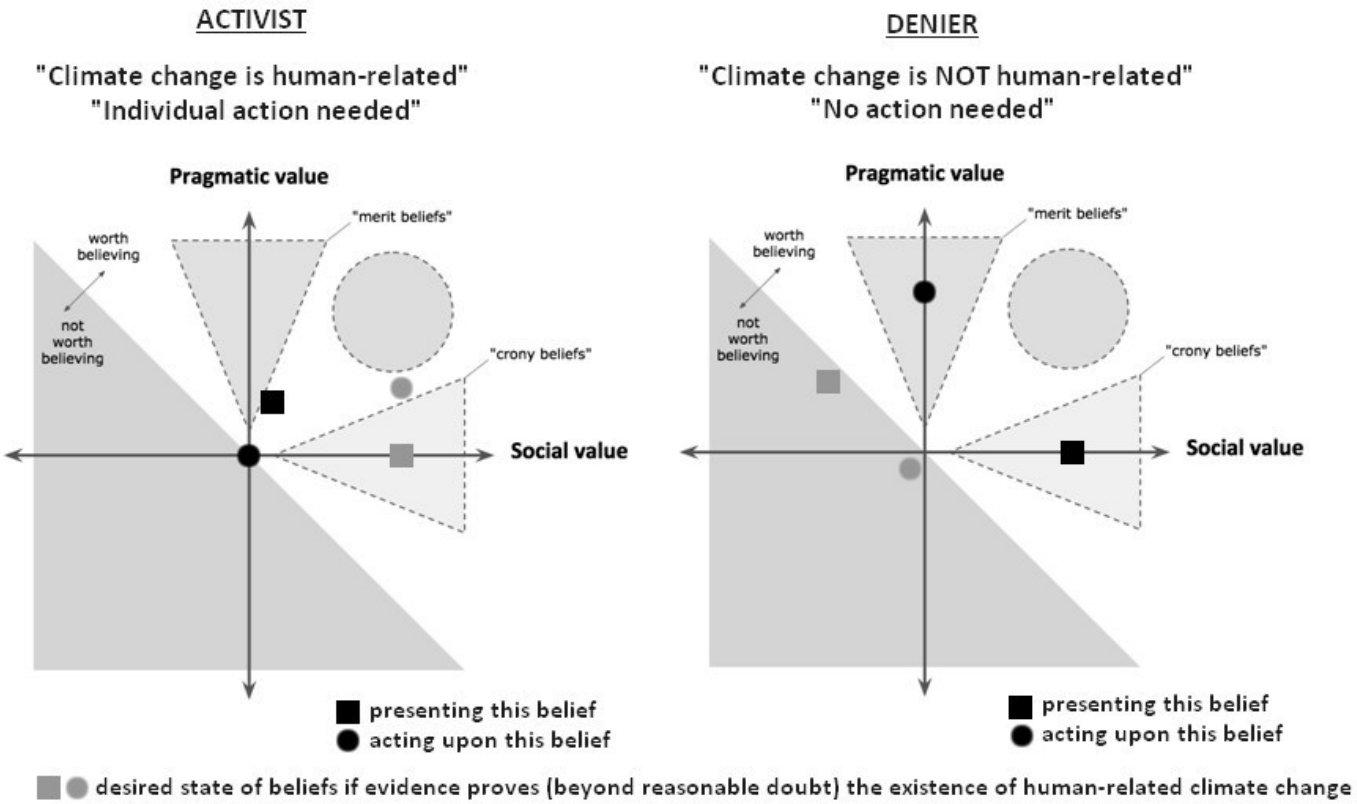

Figure 4: Presenting and acting upon beliefs

Since there is not enough pragmatic value to be gained from believing and acting upon anthropogenic climate change (gains from applying this knowledge, money earned etc.), in order to progress towards higher rationality, we should move diagonally – by shifting social values. Here, I claim that refining social reward mechanisms so that a growing number of people is socially rewarded for believing and acting upon global warming is the most effective way to progress towards rational awareness and responsibility of citizens.

We will elaborate on this finding in the conclusion, assessing if this premise applies to the U.S. society and if so, what particular steps should be taken to progress in the right direction. Now, after we explored the social reward mechanisms in the theory of rational irrationality and found out why people hold crony beliefs in this regard, we shall explore the applicability of this theory to global warming, focusing more on the epistemic properties of this global issue and trying to find out why people exhibit very rationally irrational behavior towards it.

3.1.1 Climate change: too distant to believe

When generalized, global warming exhibits properties of an exemplar global problem because no matter how overwhelming the evidence is, potential effects of our individual actions on global warming are too negligible and the effects of global warming too abstract and too distant in space and time to have any foreseeable expected rewards for us. This lack of vivacity makes it very difficult for human brain to feel any urgency. Moreover, the structure of the issue of climate change tends to bring multiple sources of structural biases into play simultaneously.[76] There are other aspects that render climate change difficult to comprehend and act upon (science of climate change is extremely complex and its findings are vulnerable to mistrust, short term weather changes create cognitive illusions etc.), but the apparent distance is the most important one.

The factors of space and time distance are the two most negative properties that produce high irrationality and indifference among general public towards global warming. In the following section, I will consider whether the theory of rational irrationality does not lose its relevance when we scale up both the size of the group and the timeframe, as we obviously need to do in case of climate change. We consider two factors:

- **Size factor** - whether the theory becomes more or less relevant when scaling up the size of a group we apply it to, and
- **Time factor** - how accurately the theory claims our beliefs are updated when confronted with a new evidence, that are constantly being developed and appear over time.

[76] Matthew Humphrey, "Rational irrationality and the 'Paradox' of Climate Change," *The SAIS Europe Journal* (Nov. 1, 2008), http://www.saisjournal.org/posts/rational-irrationality-and-the-'paradox'-of-climate-change (accessed April 4, 2017).

3.2 Size factor: rational irrationality in large group settings

There is a persuasive evidence to believe, that the presence of rational irrationality is directly correlated with a size of a group. Andreas Kyriacou in his 2011 study "Rational irrationality and Group Size"[77] claims, that the larger the group is, the more rationally irrational behavior is observed among its members:

> "Individual members of large groups can more cheaply bias downwards their beliefs as to the immorality of their free-riding thereby circumventing internal moral constraints. The relative anonymity inherent to large number settings, moreover, reduces social pressures against free-riding stemming from some common ethical or moral norms."[78]

This correlation is, however, not inevitable. As Kyriacou explains, people in large societies may be more likely to contribute towards collective goods during periods of strong social stress such as natural disaster or a war, because "during such times the cost of biasing one's beliefs about the immorality of being [instrumentally irrational] increases (since it is difficult to pretend that nothing is wrong), as do social pressures against such behavior."[79] Rationally irrational behavior might be, if fact, advantageous in social contexts, when it is desirable to undermine group prospects for mobilization towards harmful cause or in order to reduce the likelihood of conflict.

Statistically, however, the correlation holds. In fact, having understood the concept of belief creation, it is rather intuitive that in large group settings, people rarely act altruistically (epistemologically and intrinsically rationally) without having any instrumental reasons for it. Those reasons can be an expected social reward in any form, the illusion of control or simply an enjoyment of the act of contributing.[80] This applies especially well to beliefs about global issues.

3.2.1 Rational irrationality on a global scale

Global issues, by nature, must be solved in a largest possible group setting – the entire humanity. The theory tells us, that in these cases, people are extremely unlikely to develop intrinsically altruistic beliefs if not having any instrumental (utilitarian, selfish) reasons for it. Moreover, global issues must be solved based on a political consensus of large groups of actors with highly diverse interests (nations, corporations etc.), which, as Caplan claims, is even more difficult: "the logic of collective belief shows that agents may rationally choose irrational political views even though their collective irrationality makes them worse off."[81]

[77] Kyriacou, „Rational irrationality and Group Size," 109.
[78] Ibid., 109.
[79] Kyriacou, „Rational irrationality and Group Size," 125.
[80] J. Elster, "Rationality, Morality, and Collective Action." *Ethics* 96, No. 1 (1985): 136–155.
[81] Caplan, "The Logic of Collective Belief." *Rationality and Society* 15 (2003): 218–242.

"When the expected cost of irrationality is zero, it allows people to fully indulge their irrational beliefs: For most people, there are no practical repercussions of doubting the theory of evolution or believing that one's nation is the 'best in the world'"[82] According to the 1996 U.S. General Social Survey, for example, nearly two-thirds of respondents declare that they have "no doubts" about the existence of God.[83] People tend to have no doubts about the existence of God because not having doubts has no foreseeable costs and it might have some social benefits. Doubting would have some potential epistemic benefits (navigating in the world better) but it would often incur a lot of social and psychological costs. For people in those settings, it would be instrumentally irrational to act epistemologically rationally. Very similar reasoning applies to beliefs about human-related climate change.

3.3 Time factor: belief updating and polarization

Another property of human-related climate change is, that the evidence (solely based on which we update our beliefs) changes over time. Therefore, it is important to understand the extent of rationality with which people approach new scientific evidence. Causal decision theory would expect that if confronted with new evidence contrary to one´s beliefs, the person would update the previous belief accordingly or at least be more doubtful about it. Unfortunately, it is often not the case and "belief polarization" occurs. As Cook and Lewandowski explain:

> "belief polarization is said to occur when two people respond to the same evidence by updating their beliefs in opposite directions. This response is considered to be "irrational" because it involves contrary updating, a form of belief updating that appears to violate normatively optimal responding, as for example dictated by Bayes' theorem."[84]

People approach new evidence irrationally when it seems instrumentally rational to do so. When a person who is strongly dismissive about human-related climate change ("denier") is presented with the fact that there is a 95% scientific consensus[85,86] (95% of all peer-reviewed climate research of domain experts) that climate change is human-related, the person often argues for a conspiracy, scientific "groupthink", biased research etc., leaving even more convinced in his or her dismissive attitude.

Psychological reasons for this phenomenon (confirmation bias, self-serving bias, cognitive dissonance etc.) can be all summed up in a finding that it is instrumentally rational for the person to defend one´s own position during such confrontation, because it is perceived (usually wrongly) that not doing so

[82] Caplan, "Rational irrationality: A Framework for the Neoclassical-Behavioral Debate." *Eastern Economic Journal* 26, No. 2: 191–211.
[83] Caplan, "Rational Ignorance Versus Rational irrationality." *Kyklos* 54, No 1 (2001): 3–26.
[84] Cook, Lewandowski, „Rational irrationality," 160.
[85] W. R. L., Anderegg et al., "Expert credibility in climate change." *Proceedings of the National Academy of Sciences of the United States of America* 107 (2010), http://www.pnas.org/content/107/27/12107.full (accessed April 15, 2017)
[86] P. Doran, M. Zimmerman, "Examining the scientific consensus on climate change." *Eos, Transactions American Geophysical Union* 90 (2009): 21–22.

would incur more expected costs than benefits. Contrary updating or a "worldview backfire effect"[87] is seen across a wide spectrum of issues, but we gain two core findings from the concept of belief polarization. The first finding is that people can become (at least in a short term) more irrational when new factual evidence is presented, especially if it is radical or implies a need for action. The second finding is that the psychological type of the person and the society the person comes from (with its specific social reward mechanisms) is crucial when being confronted with new factual evidence.

3.4 Chapter conclusions

Using the theory of rational irrationality, we explained why for most of us, it is at times advantageous to act rationally in a selfish, utilitarian and pragmatic manner in a short term. This is what our brains were built to do, to reason about the causes in an easily foreseeable future. Before mankind got advanced enough to start building mechanisms or creating products (green gas emissions, weapons of mass destruction, genetic mutations, possibly AI) that could wipe-out the entire humanity, there was no evolutionary reason for our brains to rationalize further than within an accessible geographic location in a timeframe no more than a couple of years ahead. The short-term rationalization can be, however, very disruptive in dealing with long-term events and it is, by nature, actually very counterproductive in dealing with global events and existential risks such as climate change.

When expected social benefits of holding on to empirically irrational (crony) beliefs provide higher expected utility then the expected benefits of altering towards an evidence-based (merit) belief, people often choose to be utilitarian and not update their beliefs or even to update them in the opposite direction to the factual evidence. Therefore, it is instrumentally rational for many people to be indifferent towards climate change at the moment, because such neglect provides them with a higher expected sum of pragmatic and social values than the opposite belief would. Some additional claims of this chapter are summed up in following bullet-points:

- Even in complete-information settings, an intelligent human agent does not always act completely rationally.
- Psychological profile of the agent and the society the agent comes from (with its social reward mechanisms) are crucial factors in belief updating while confronted with new factual evidence.
- The most effective way to improve awareness about the urgency of climate change is to incentivize people to rationalize each other, and to do so by restructuring and improving social reward mechanisms. All the other aspects (more rationality in public debate, new economic incentives, less biased media, better political consensus, etc.) should follow.
- Moreover, if people are incentivized to hold epistemic beliefs about climate change, this trend is likely to have spillover effects on awareness of other global issues as well.

[87] S. Lewandowsky et al, "Misinformation and its correction continued influence and successful debiasing." *Psychological Science in the Public Interest* 13, No. 3 (2012): 106–131.

Seeing the importance of social reward mechanisms in individual rationality towards global issues and the importance of social discourse (along with other factors) in the process of updating beliefs, we shall proceed to narrow our focus specifically on the American society. When we consider the politico-economical importance of the USA as a global power whose political actions concerning climate chance are highly important for the effectiveness of the fight against global warming, it is reasonable to be concerned about the recent positions of the US government in this regard.

The election of Donald Trump as the 45th President of the United States (considering his previous statements such as the global warming being a hoax perpetuated by the Chinese,[88] the anthropogenic climate change denial as an important part of his campaign rhetoric or the assignment of climate change skeptic Scott Pruitt as a chief of the Environmental Protection Agency)[89] makes one wonder what will be the next steps of Trump´s administration in this regard. Climate change is a politically and economically highly important issue for us to unconditionally understand how is it possible, that only 48% of U.S. citizens believe in anthropogenic climate change while 95-98% of climate scientists say that there is overwhelming and easily accessible evidence for it.[90]

I believe that it would be wrong to assign responsibility for this setback of rationality solely to Donald Trump and his campaign. To a large extent, Trump only accommodated his rhetoric into the existent public mood in order to appeal to his intended audience of voters. The media is to take a substantial share of the blame, as will be mentioned in the conclusion, but the next chapter is more about exploring whether there are any inherent properties of the American mentality, that make the national consensus more susceptible to irrationality. In the next chapter, therefore, using the concept of rational irrationality I attempt to answer the following questions:

- Are Americans inherently more likely to hold irrational beliefs about global issues?
- If so, is this phenomenon rooted in the essence of American identity?

[88] „Trump Has Called Climate Change a Chinese Hoax," *The New York Times* (Nov. 18, 2016), https://www.nytimes.com/2016/11/19/world/asia/china-trump-climate-change.html (accessed March 11, 2017).
[89] Robinson Meyer, "Trump's EPA Chief Denies the Basic Science of Climate Change," *The Atlantic* (March 9, 2017), https://www.theatlantic.com/science/archive/2017/03/trumps-epa-chief-rejects-that-carbon-dioxide-emissions-cause-climate-change/519054/ (accessed March 11, 2017).
[90] Cary Funk, Bryan Kennedy, "Public Views on Climate Change and Climate Scientists*", Pew Research Center* (Oct. 4, 2016), http://www.pewinternet.org/2016/10/04/public-views-on-climate-change-and-climate-scientists/ (accessed March 11, 2017).

Chapter 4: Rational Irrationality and Climate Change in the USA

"Given that there's even a reasonable risk of disruptive climate change, any sensible person should decide to act. It's insurance. We don't need to be 100% sure that the worst fears of climate scientists are correct in order to act. All we need to think about are the consequences of being wrong."

Tim O´Reilly

"The risk of climate change is clear and the risk warrants action. Increasing carbon emissions in the atmosphere are having a warming effect."

Exxon Mobil

"Climate change is a hoax perpetuated by the Chinese."

Donald Trump

4.1 U.S. public and climate change

According to the 2016 Pew Research survey, 48% of American adults say climate change is mostly due to human activity; 31% say it is due to natural causes and 20% say there is no solid evidence of warming.[91] "The share of people saying human activity is the primary cause of climate change is about the same as Pew Research Center surveys in 2014[92] (50%) and 2009 (49%). The Center´s surveys from 2006 to 2015 using somewhat different question wording found a similar share expressing this view (45% in the most recent, 2015 survey[93])."[94] Interestingly enough, the US public beliefs about climate change do not seem to change over time. Considering that much reliable scientific research has been conducted between 2006 and 2016 (statistically strengthening the side of the argument claiming that it is a problem and needs to be dealt with), the evidence hints that the phenomenon of belief polarization in the US society is occurring.

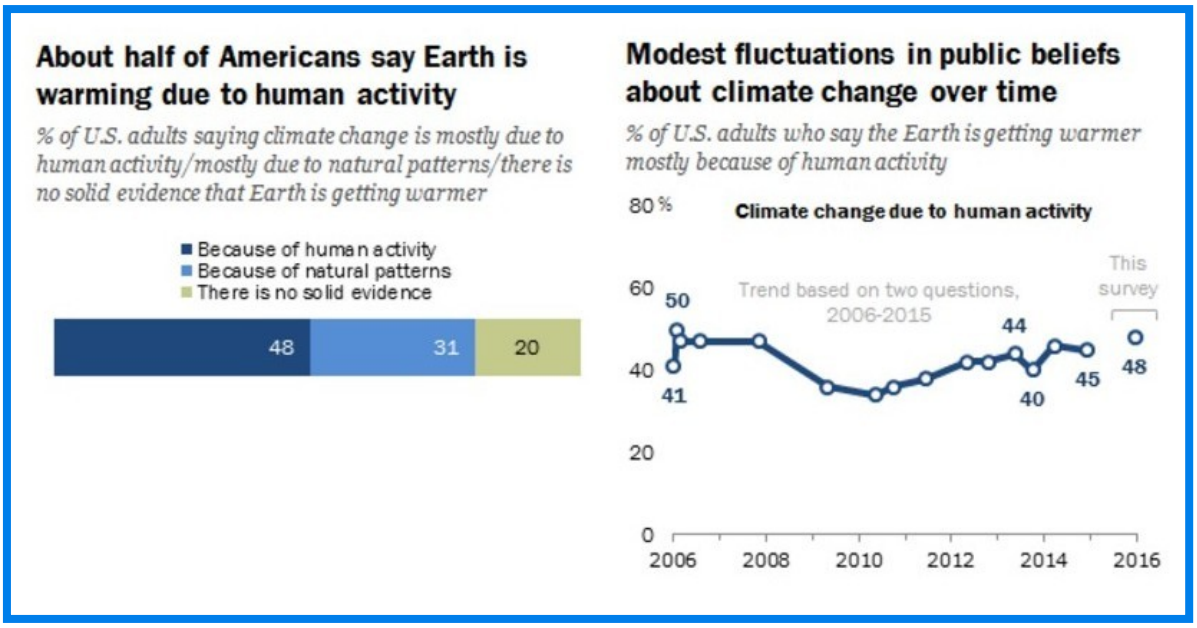

Figure 5: Human Activity, Change over time[91]

[91] Funk, Kennedy, "Public Views on Climate Change and Climate Scientists."
[92] "Climate Change and Energy Issues" *Pew Research Center*, July 1, 2015, http://www.pewinternet.org/2015/07,/01/chapter-2-climate-change-and-energy-issues/ (accessed April 12, 2017).
[93] "Catholics Divided over Global Warming", *Pew Research Center*, June 16, 2015, http://www.pewforum.org/2015/06/16/catholics-divided-over-global-warming/ (accessed April 12, 2017).
[94] Funk, Kennedy, "Public Views on Climate Change and Climate Scientists".

To be fair, even though roughly half of the population does not assign any human influence to global warming the latest 2016 Gallup poll[95] shows, that more people are worried about climate change in general, especially within the last year. Therefore, it is possible that the situation is beginning to change in a positive direction.

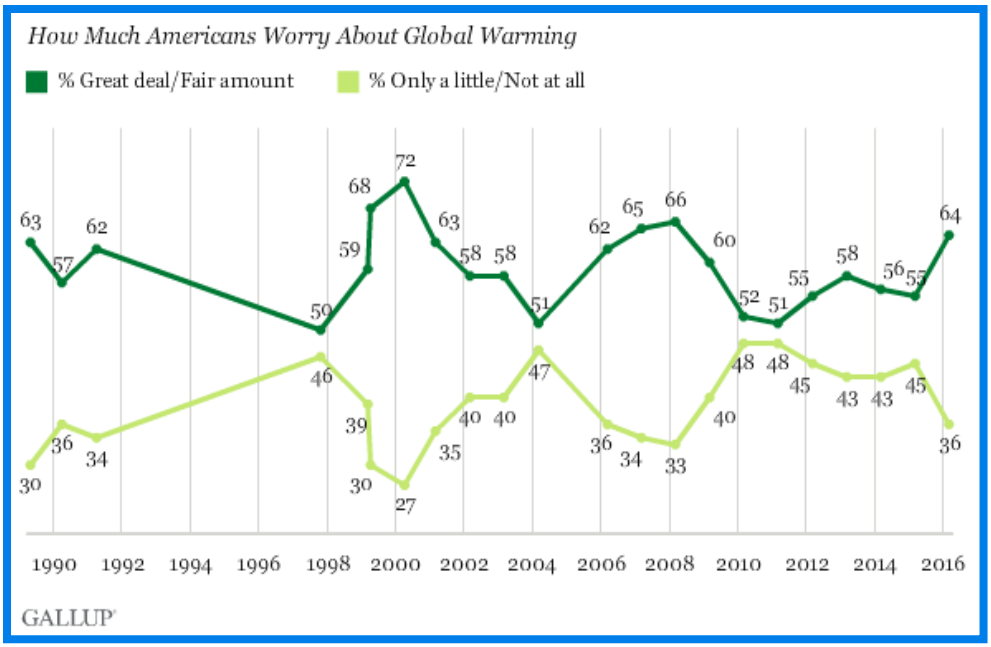

Figure 6: Worry about climate change[94]

4.1.1 Underestimated scientific consensus

The Intergovernmental Panel on Climate Change (IPCC) reflecting scientific opinion on the topic, stated already in its 2013 report that "the science now shows with 95 percent certainty that human activity is the dominant cause of observed warming since the mid-20th century."[96] Many analyses of scholarly publications suggest widespread consensus (92-98%) among climate scientists at the moment.[97]

[95] Lydia Saad, Jeffrey Jones, "U.S. Concern about global warming eight year high", *Gallup*, March 16, 2016, http://www.gallup.com/poll/190010/concern-global-warming-eight-year-high.aspx (accessed April 12, 2017).
[96] "Climate Change: The Physical Science Basis." *Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (2013), https://www.ipcc.ch/report/ar5/wg1/ (accessed March 11, 2017).
[97] Bart Verheggen et al., "Scientists' Views about Attribution of Global Warming," *Environmental Science & Technology* 48, No. 16 (2014), and P.T. Doran and M.K. Zimmerman, "Examining the Scientific Consensus on Climate Change", *Eos* 90, No. 3 (2009).

In the view of the public, however, the consensus is non-existent. In 2016, "just 27% of Americans say that "almost all" climate scientists hold human behavior responsible for climate change. 35% say more than half of climate scientists agree about this, while an equal share say that about fewer than half of scientific experts believe that human behavior is the main contributing factor in climate change."[98]

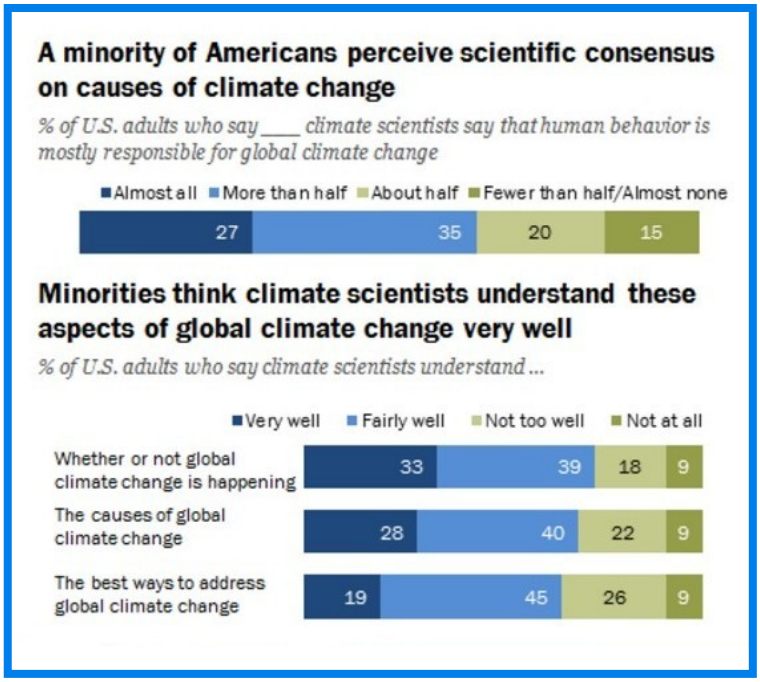

Figure 7: Scientific consensus and unity[98]

[98] Funk, Kennedy, "Public Views on Climate Change and Climate Scientists."

4.1.2 Political divides

As the Pew Research Center further claims, "political divides are dominant in public views about climate matters. […] Most liberal Democrats espouse human-caused climate change, while most conservative Republicans reject it." This survey, moreover, finds that political differences over climate issues extend across a variety of beliefs - about the expected effects of climate change, about the actions that can mitigate it or about the trust and credibility in the work of climate scientists. "People on the ideological ends of either party, that is liberal Democrats and conservative Republicans, see the world through vastly different lenses across all of these judgments."[99]

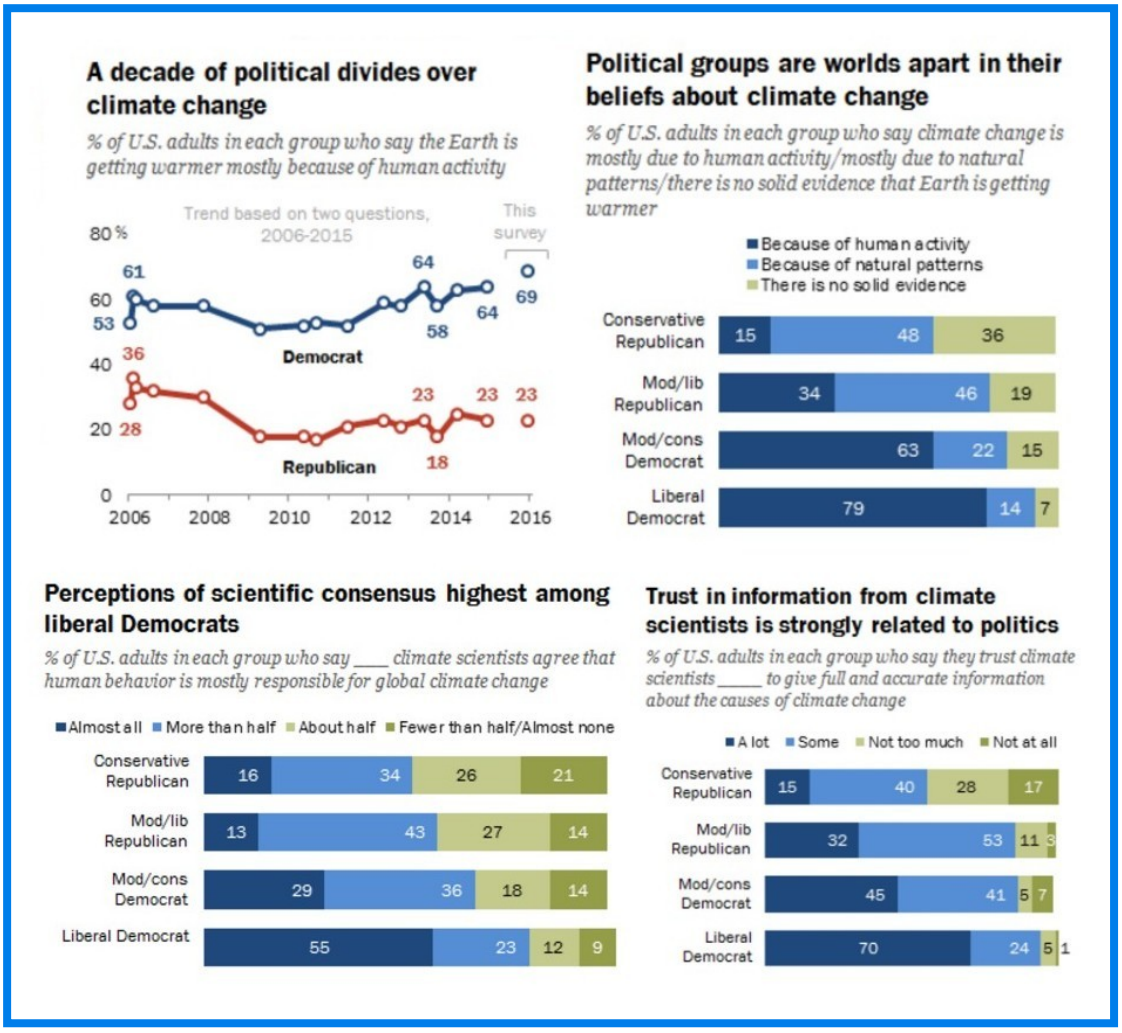

Figure 8: Political divides[99]

[99] Ibid.

4.2 Are Americans exceptionally irrational about climate change?

In order to understand the specificity of American views and actions on climate change, we need to focus on the large part of the population that exhibits rationally irrational behavior. There will always be radical believers on both sides of the argument, but they are statistically more likely to have based their strong beliefs on emotions, rendering them more likely to be both instrumentally and epistemologically irrational. Therefore, it is appropriate to leave out these radical viewpoints from our assessment.

4.2.1 Discrepancy between beliefs and actions

In the 2006 study "An American Paradox"[100], Dale Jamieson describes an interesting phenomenon that has a potential to answer our questions. Jamieson claims an unusually high gap between proclaimed attitudes and actions in the USA. He says that Americans are similarly more likely than other nations to claim climate responsibility and signal one´s own willingness to act, but the actual data show unusually "little willingness to restrain their behavior or to support specific fiscal policies". Since the Rio Earth Summit in 1992 (despite some policy retreats from the Kyoto Protocol in 1997), survey data suggest that a majority of Americans:

- think of themselves as environmentalists;
- say they generally are willing to pay for green policies; and
- believe that climate change is real and bad; and are willing to pay to mitigate it.[101]

At the same time the data shows about Americans, that:

- they support policies less if they are more carefully specified and costs are associated with them
- they especially dislike policies that are most favored by economists and policy experts
- they often vote for environmentally abusive candidates.[102]

Jamieson calls this discrepancy an American Paradox and, while not proposing concrete explanations, he sets a theoretical foundation for the studies of this phenomenon. The same phenomenon can be described as *moral cheering*, as we discussed in the previous chapter. Approaching this problem using the concept of rational irrationality, however, it seems that it might not be a paradox at all. The seemingly irrational combination of moral cheering and real-world neglect of many Americans about climate change actually has a rational basis.[103] People demand and commit to "strong" actions against climate change in the abstract, but shun concrete policy proposals, because they have concrete costs attached (or at least implied). As Mathew Humphrey explains, "a definite $1,000 cost [environmental tax, for example] is being set against what is likely to be completely unquantifiable - the benefits to that

[100] Dale Jamieson, "The American Paradox," 97.
[101] all Dale Jamieson, „The American Paradox," 97.
[102] all Dale Jamieson, „The American Paradox," 98.
[103] Mathew Humphrey, "Rational irrationality and the 'Paradox' of Climate Change."

individual of climate change mitigation."[104] When there are no strong social benefits to be gained from acting morally, this clash of instrumental and epistemic rationality can have only one winner. The fact that in these situations, Americans choose to be instrumentally rational more often than members of other nations is the core of the "American paradox".

Setting aside all the defective heuristics and many cognitive biases that are affecting one´s decision, in this situation, people generally choose to not proceed with this costly individual action. In order to reason for themselves or their peers such a decision (especially when having signaled the opposite belief previously), they have basically two options to resort to. If they hold other beliefs that could be in conflict with climate change mitigation (unregulated free-market advocacy, conspiracy theories etc.), they claim to prioritize those values to reason one´s own neglect (while often radicalizing themselves in those beliefs that are statistically less-likely to be accurate). Alternatively, people can resort to claiming distrust in the accuracy of the proof and the expertise or intentions of the climate scientists.

In order to find at least a somewhat reasonable evidence for their crony belief about climate change (act of which is accompanied by moral cheering - the discrepancy between words and actions which some people might call hypocrisy), people naturally tend to claim distrust in scientific evidence. In relation to that, moral cheering seems to be atypically high in the American society. In order to assess the real level of occurrence of rational irrationality in the USA, we shall explore especially two related issues that are observed as closely related to moral cheering and are at the same time relatively easily measurable: the presence of strong and potentially opposing worldviews, and the amount of public distrust in scientific evidence.

4.2.2 Opposing worldviews in the USA

In the past 10 years, there have been studies[105,106,107] conducted in the USA observing the correlation between irrationality (or belief polarization) regarding climate change and other worldviews (religious beliefs, support for free markets or political party affiliation of individuals). Many of those studies adhere to the claim that "political affiliation correlates highly with beliefs about climate change with people who endorse unregulated free markets being more likely to reject evidence provided by climate scientists."[108]

It seems that the conservative, free-market advocates are less likely to accept the urgency of climate change not because they intentionally do not want to believe the evidence, but because it would imply, that environmental regulation is needed, which would undermine their free market advocacy. Here, for

[104] Mathew Humphrey. "Rational irrationality and the 'Paradox' of Climate Change."
[105] Y. Heath, R. Gifford, "Free-market ideology and environmental degradation — the case of belief in global climate change." *Environment and Behavior* 38 (2006): 48–71.
[106] D. M., Kahan et al., "The tragedy of the risk-perception commons: culture conflict, rationality conflict, and climate change." *Temple University Legal Studies Research Paper*, No. 26 (2011).
[107] S. Lewandowsky et al., "The pivotal role of perceived scientific consensus in acceptance of science." *Nature Climate Change* 3, No. 4 (2013): 399–404.
[108] Cook, Lewandowski, "Rational irrationality."

many conservatives it is both socially and instrumentally rational to dismiss the evidence, because losing the appearance of a dedicated free-market believer (being often a life-long constructed, socially valued belief) would incur vastly more costs (ideological restructuring of many related beliefs, cognitive dissonance etc.) than benefits that could be reasonably expected from believing in anthropogenic climate change. In other words, being both a believer in human-related climate change and unregulated free markets seems to many conservatives more dangerous (their views could be seen inconsistent by their peers and they would have to put a lot of intellectual effort into arguing them) than simply rejecting the evidence for anthropogenic climate change.

4.2.3 American distrust in scientific evidence

A 2009 study published in the Risk Analysis journal claims, that "trust in climate scientists has been observed to be a driving factor behind polarization over climate change",[109] While agreeing with the correlation, I use my previous finding to claim that the distrust in scientists is not a driving force, but rather a product of this pragmatically utilitarian, lesser-of-two-evils reasoning. The act of rejecting the evidence, that many people resort to for reasons aforementioned, directly implies distrust in the scientists (thus arguing either for a bias and group-think or hidden intentions and conspiracy behind climate research, no matter if conducted in the USA or not). This distrust is the only possibly reasonable argument for being negligent, so people claim their distrust in climate scientists publicly (as evident from the Pew Research survey above), almost as a form of a crony belief defense mechanism.

Here, it is important to note that there is some basis in the claims of the unusual unreliability of scientists. The so-called scientific groupthink or specific biases that scientists are similarly or even more likely to experience than any other member of the general public can all be used as arguments of people who tend to deny any evidence when it undermines their instrumental goals. This argument is well explained by Michael Huemer: "The best experts did only slightly better than chance at predicting outcomes [according to a recent study conducted by Phillip Tetlock]. When asked to assign probabilities to their predictions, experts proved systematically overconfident. […] What the experts were good at was rationalizing their failures. […] Thus, experts are probably even less reliable when it comes to these untestable matters."[110]

The distinction is that such unreliability is present in the areas of political science, sociology or philosophy, where the assumptions are usually complex, blurry and hardly testable. In climate science, however, there is hard data that is more difficult to dispel. So even though the scientists may be very unsure about the social and environmental consequences of climate change, there is data that it exists and is highly influences by human-produced CO2 emissions, so this argument doesn't hold. And even if we accounted for those biases and decreased the estimated scientific consensus from 95% to 80%, it would not change the conclusions that a rational person should arrive at.

[109] A. Malka et al., "The association of knowledge with concern about global warming: Trusted information sources shape public thinking." *Risk Analysis* 29 (2009): 633–647.
[110] Huemer, „In Praise of Passivity", 15.

We can assume, therefore, that some of the conservative American values (especially free-market advocacy, religiosity, individualism and exceptionalism) in the USA are a partial reason for the negligence of approximately half of the population about climate change. Before we proceed to defining the American values and their influence on rationality, however, we should strengthen the argument for exceptionality of the scale of the American´s public neglect towards climate change by comparing the data to other countries, which is notably a more difficult task to do.

4.3 Belief polarization in the USA

A study published by Cook and Lewandowski[111] in 2016 conducted research using "Bayesian networks" in order to compare views of Americans and Australians on Anthropogenic Global Warming (AGW). The study proved a strong correlation between free-market beliefs and climate change neglect (both the neglect of its existence and the perceived human contribution to it) in the USA compared to Australia (see figure 9).

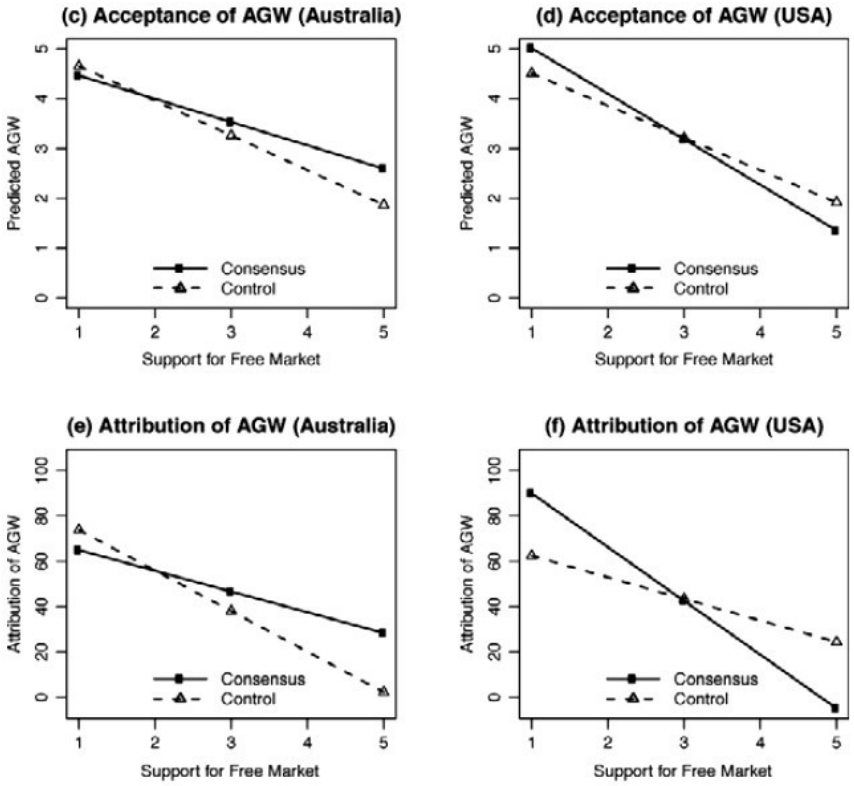

Figure 9: Acceptance and Attribution[111]

[111] Cook, Lewandowski, "Rational irrationality."

The research (being based on claims of the psychologist van der Linden[112]) was mainly focused on belief polarization. Individuals were confronted with a statement, saying that there is a very strong scientific consensus about the existence of human-related global warming. As a result, the study claimed that this new information had "slightly worldview-neutralizing effect on Australians but a backfire effect on a small proportion of Americans with strong conservative (free-market) values."[113]

Moreover, after the research, trust in the scientific community among Australians was unchanged, while among U.S. participants, "the consensus intervention polarized trust with free-market supporters becoming more distrustful of scientists when informed about the scientific consensus."[114] Even though there might have been various shortcomings in the research and it was focused only on two countries, the study´s apparent adherence to a wide range of previous studies (arriving to similar conclusion) make the argument for exceptional irrationality of hard-line American conservatives backed by at least some epistemic data.

Here, while accepting that conservatism and free-market ideology (as wider political worldviews) are strongly correlated with beliefs about climate change in the USA, we can proceed to explore, if there are any inherent American values that make conservatism and free-market advocacy unusually thrive (and be less prone to rational criticism) in the first place.

4.4 Values and properties of American identity

It is largely agreed that the core of American identity and its social values has been created upon the Anglo-Saxon ethnic racial model of white, European immigrants holding the values of protestant ethics. From a large number of social theories about American identity and mentality, it is evident that there are certain values and properties of American people that make them distinctive from other nations. In addition, many Americans are aware of those perceived differences and that culture to a large extent cherishes the ideals of American exceptionality. These values have been notably altered by the influence of the African-American part of the population, the immigrants of Hispanic origin and other minorities throughout the nation´s historical development, but the values that the political system is based on and that especially the conservative Americans perceive as the real American values largely remain those of the Founding Fathers.

As Martin Seymour Lipset claims the United States is a "country uniquely unified by an allegiance to a common set of ideals. […] The American Creed can be described in five terms: liberty, egalitarianism, individualism, populism and laissez faire, [while] egalitarianism in its American meaning, as observed earlier by Tocqueville, involves equality of opportunity and respect, not of result or condition." [115] Alexis

[112] S. van der Linden, "What a hoax." *Scientific American Mind* 24, No. 4 (2013): 40–43, http://scholar.princeton.edu/sites/default/files/slinden/files/conspiracyvanderlinden.pdf (accessed March 15, 2017).
[113] Cook, Lewandowski, "Rational irrationality.," 175.
[114] Ibid, 176.
[115] Seymour Martin Lipset, *American Exceptionalism: A Double-Edged Sword* (New York: W.W. Norton and Company, 1996), 19.

de Toqueville, who was the first influential figure to talk about American exceptionalism, wrote, that "The position of the Americans is […] quite exceptional, and it may be believed that no other democratic people will ever be placed in a similar one.[116]

4.4.1 Exceptionalism and individualism

The exceptionalistic and messianic cultural tradition has a long history dated back to the vision of the Massachusetts Bay Colony as a 'City Upon a Hill' in the sermons of the Puritan John Winthrop.[117] Later, the rhetoric of Manifest Destiny arguing for westward expansion, the "Wilsonian vision of U.S. power making the world safe for democracy after World War I, and Roosevelt's crusade for the 'four freedoms' in World War II"[118] can be seen as attempts to materialize those messianic ideals. According to Taesuh Cha, American exceptional identity is a product of multiple relationships with historical and contemporary others (the "othering") and the only liberal internationalism Americans can accept must be based on American exceptionalism.[119]

The reasons behind such society-wide perception of its own exceptionalism can be explained by Michal Ignatieff´s claim, that the American "desire for moral leadership is something more than the ordinary narcissism and nationalism that all powerful states display. It is rooted in the particular achievements of a successful history of liberty that U.S. leaders have believed is of universal significance, even the work of Providential design."[120] Both the historical proof of success (no matter if the success was factual or only perceived) and religious entitlement are crucial factors for understanding the American exceptionalism and conservatism.

Individualism is, according to the Geert Hofstede´s index of cultural dimensions,[121] the degree to which individuals are integrated into groups and it is an opposite of collectivism in a society. "The United States can clearly been seen as individualistic (scoring the highest in the world), while the adherence to the *American dream* is clearly a representation of this."[122] This is the Americans' hope for a better quality of life, higher standard of living than previous generations and the opportunity for anyone to raise himself from poverty. As Tocqueville observed one of the possible reasons of the American individualism, "there are more and more people who […] have gained and kept enough wealth and enough understanding to look after their own needs. Such folk owe no man anything and hardly expect anything from anybody. They form the habit of thinking of themselves in isolation and imagine their

[116] Alexis de Tocqueville, *Democracy in America* (Cambridge: Sever and Francis, 1863), 36.

[117] Michael Ignatieff, *American Exceptionalism and Human Rights* (Princeton: Princeton University Press, 2005), 13.

[118] Walter Russell Mead, *Special Providence: American Foreign Policy and How It Changed the World* (New York: The Century Foundation, 2001).

[119] Taesuh Cha, "The Formation Of American Exeptional Ideas: A Three-Tier Model of The Standard Of Civilization in US Foreign Policy." *European Journal of International Relations* 21, No. 4 (2015): 743-767.

[120] Ignatieff, „American Exceptionalism", 14.

[121] "Individualism - Geert Hofstede cultural dimensions", *Clearly Cultural*, http://www.clearlycultural.com/geert-hofstede-cultural-dimensions/individualism/ (accessed April 9, 2017).

[122] Ibid., 1.

whole destiny is in their own hands."[123] The value of individualism in the USA seems to play a substantial role in creating one´s beliefs about the world, especially about issues that naturally require unprecedented collective action, as is the case of climate change.

4.4.2 Religiosity

Allan Bloom, a famous advocate of conservatism in the USA, claims that American Christianity is a special case, because since the origin of the nation, the Bible "was not filtered through great national interpreters, but approached directly in the manner of early Protestantism, every man his own interpreter. The Bible was thus a mirror of that indifference to national cultures inherent in the American method."[124] Notably, according to the 2015 Gallup poll[125] (figure 10) it seems that the USA is by far the most religious country among wealthy nations (by GDP per capita).

In order to compare societies by holding values usually connected with being religious or traditional, we can use the Inglehart–Welzel cultural map of the world[126] created by the World Values Survey organization. Their studies show (figure 11), that the American society exhibits an unusual combination of traditional (rather than secular-rational) values and self-expression (rather than survival) values. Notable is the antagonism between secular-rational values (being similar to individualism) and traditional values provided in this study, as well as the similarity of the deviation of the US society from the average in both mentioned surveys. This can be seen as a proof of relationship between the amount of irrationality, traditional religious values and (to a large extent) conservatism in the USA.

[123] Alexis de Tocqueville, *Democracy in America* (Parennial Claasics, 1969), 508.
[124] Allan Bloom, *The Closing of the American Mind* (New York: Simon & Schuster, 1988), 54.
[125] "Global Attitudes Survey*", Pew Research Center*, Dec 21, 2015, http://www.pewresearch.org/fact-tank/2015/12/23/americans-are-in-the-middle-of-the-pack-globally-when-it-comes-to-importance-of-religion/ft_15-12-17_religioussaliencescatter/ (accessed March 20, 2017).
[126] "Inglehart–Welzel cultural map of the world", *World Values Survey* (2011), http://www.worldvaluessurvey.org/wvs.jsp (accessed March 20, 2017).

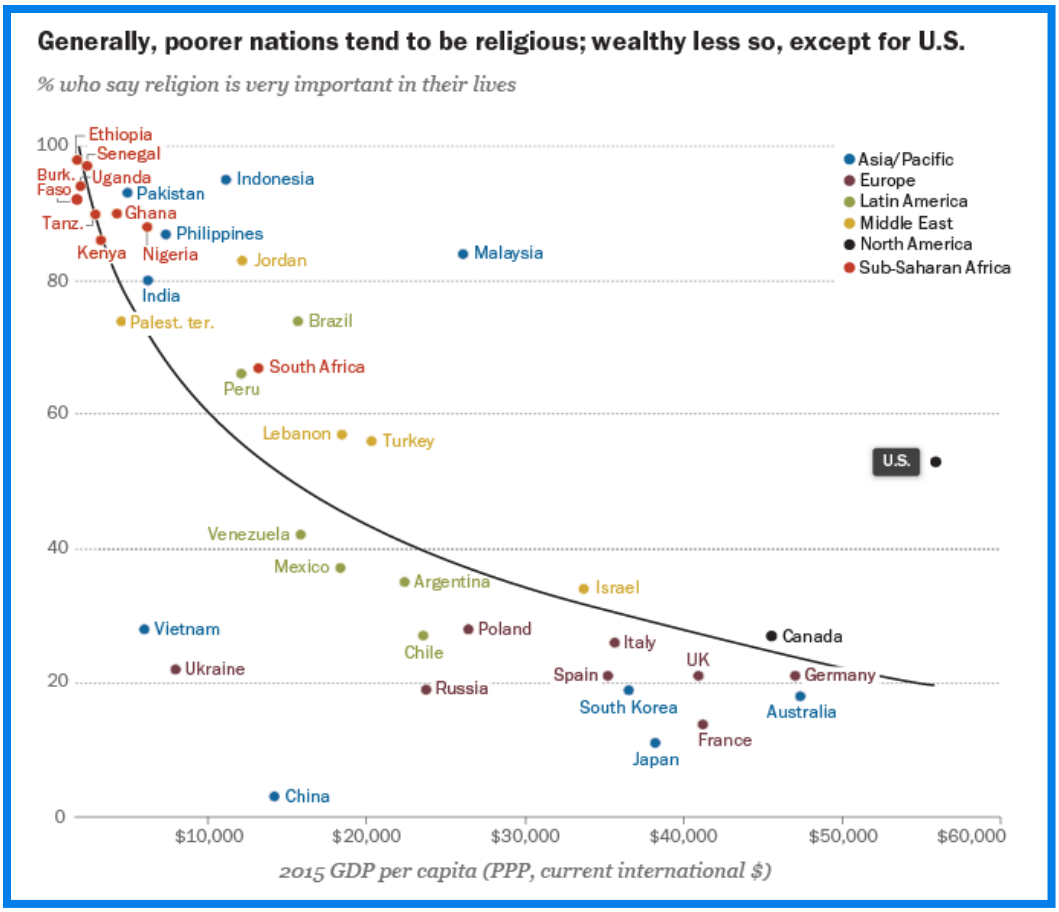

Figure 10: Religiosity and wealth[125]

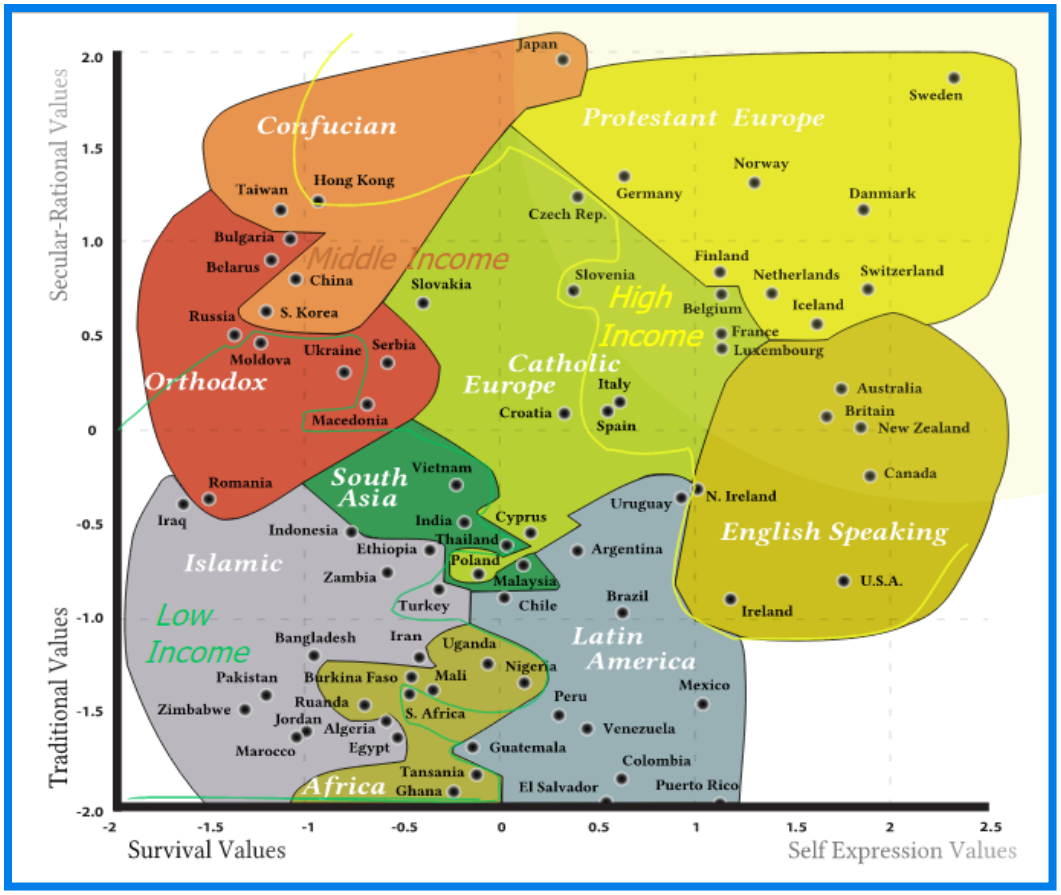

Figure 11: Inglehart-Welzel cultural map of the world[126]

4.4.3 Conservatism and traditional values

Moravcsik argues that "in comparison to post-1945 Europe, American political culture is significantly more conservative and more influenced by evangelical religious minorities, [the fact which] makes it unlikely that American opinion will ever align with the more liberal international consensus […]." Even if such conservatism concerns mostly social issues and it doesn't have a direct implication to global warming, it shows the strength of conservative worldviews in the USA. According to Bloom (an advocate of traditional values) the American tradition is long-lasting and unambiguous;

> "its meaning is articulated in simple, rational speech that is immediately comprehensible and powerfully persuasive to all normal human beings. America tells one story: the unbroken, ineluctable progress of freedom and equality. From its first settlers and its political foundings on, there has been no dispute that freedom and equality are the essence of justice for us."[127]

It seems that this persuasiveness, simplicity and morality as properties of the core American values that the society promotes and rewards (individualism, exceptionality, religiosity, tradition and conservatism) are properties that make these American values more easily articulable, understandable and promotable, but also potentially exploitable by special interests. It is important to note that these values seem to be more easily exploitable not because they are of conservative nature, but precisely because their properties make them more deeply rooted into one´s worldviews, which makes them more resistant to new opposing evidence and therefore more likely to be translated into specific crony beliefs over time.

4.4.4 Empathy and compassion

Apart from the usually stated American values, there is one other area plausible to explain the rational irrationality especially with regards to the disparity between proclaimed words and actions taken in the US society. It is the tendency of Americans to be empathetic or at least claim to be empathetic towards lives of other people. Here, an important question stands as following: does the adherence to American values make people more empathetic? If so, is it a positive factor or does it make people more emotionally driven and thus statistically less rational in cases where, for example, a single heart-breaking story is not present (cases such as the climate change)?

The problem here is that empathy itself can be a double-edged sword. Empathy is necessary for the accuracy of our decision making about other people, but it is very vulnerable to be exploited by agents (politicians, media channels, advertisers, church leaders etc.) for their own benefits. These agents often appeal to people´s emotions and exploit their empathy for their own (usually financial) benefits, using the emotional appeal as a very effective method of belief manipulation. At the same time, however, the feeling of suffering of other people (real or hypothetical) is very important in order to fight effectively against global warming. Here, therefore, I distinguish between empathy and compassion.

[127] Bloom, "The Closing of the American Mind", 54.

In his recent (2016) book "Against Empathy"[128], Yale psychologist Paul Bloom claims, that rather than empathy, rational compassion towards other people should be promoted, because it triggers more rational responses. According to Bloom, empathy can actually do more harm than good. "It is because of empathy that citizens of a country can be transfixed by a girl stuck in a well and largely indifferent to climate change. We should aspire to a world in which a politician appealing to someone's empathy would be seen in the same way as one appealing to people's racist bias."[129]

Here, I claim that adherence to the set of American values (especially exceptionalism and tradition) indeed causes society to value the signaling of empathy (moral cheering) very highly. But when it comes to specific action to be taken, especially concerning global issues, empathy is not enough and compassion in a form of rational, emotion-free assessment of facts is necessary. Due to the nature of the very same American values (especially individualism), utilitarianism and instrumental rationality prevails among Americans (often being falsely rationalized by empathy), while compassion diminishes.

4.5 The synthesis: relationship and causality between American values and behavior

It would be innacurate to definitively claim, that certain proclaimed American values make the U.S. citizens more irrational towards climate change, but many evidence hints, that it is indeed so. In this chapter I elaborated on five exceptionalities of the U.S. society that are backed by factual evidence:

- There is exceptionally high discrepancy between proclaimed beliefs and specific actions towards climate change (moral cheering),
- Americans are exceptionally distrustful of scientific evidence for anthropogenic climate change,
- Americans are more likely than other nations to update beliefs contrary to the evidence, when presented with this evidence (belief polarization),
- The USA is by far the most religious country among wealthy nations (by GDP per capita),
- American society exhibits the highest correlation between traditional and self-expression values.

Consequently, I described five American values that distinguish the society from others and are related to decision-making towards global warming:

- exceptionalism
- individualism
- religiosity
- conservatism
- tradition

Attempting to find the relationship and causality between these exceptionalities and American values, I used reasoning derived from the concept of rational irrationality, elaborated on the difference between

[128] Paul Bloom, *Against Empathy: The Case for Rational Compassion* (New York: Ecco Press, 2016), 285.
[129] Ibid., 285.

empathy and compassion as means to promote epistemic rationality, and argued for the following claims:

- Due to strong traditional and religious values (sometimes exploited by for-profit agents with interests other than promoting epistemic rationality), Americans tend to be exceptionally rationally irrational towards climate change.

- Due to the self-proclaimed exceptionalism and self-expression values, even Americans who know they are not going to act upon climate change if it implies any costs tend to proceed with moral cheering (claim they would and will act).

- When it comes to action, due to individualism, a majority of Americans are more instrumentally rational (utilitarian) and choose not to sacrifice anything when the expected benefits of acting otherwise are completely unclear.

- Rationalizing this decision, due to conservatism and free-market advocacy, Americans claim stronger adherence to those potentially opposing worldviews or claim distrust in scientific evidence, which might lead them to update beliefs contrary to evidence.

As a result, I claim that it can be seen as an inherent property of Americans to be more irrational and irresponsible towards climate change, because the main attributes of the American mentality make the individuals more likely than elsewhere to make rationally irrational decisions concerning global issues.

These attributes of American mentality are closely intertwined with the social reward mechanisms that are more prompt to reward individuals for behaving instrumentally rationally but epistemologically irrationally in the USA than in other countries. These social reward mechanisms are especially persistent in the conservative regions of the USA, where the "American values" are more frequently referred to and exploited for utilitarian purposes of conservative opinion leaders (with various economic and social interests), that are effectively incentivizing people be rationally irrational. The important role of media, corporate interests and political populism only strengthens this phenomenon, as I will elaborate on in the conclusion.

Conclusion

In this paper, the research is based on two factual claims. First, that human-related climate change exists, it might pose an existential risk to humanity and therefore it needs to be dealt with more effectively, for which increasing rationality towards global issues among citizens (especially of economically powerful democracies) is essential. Second, that there is an unusually high denial of anthropogenic climate change among the general public in the contemporary U.S. society. Combining these two claims, I suggested that the root causes of irrationality of Americans towards climate change need to be more thoroughly explored in order to more effectively prioritize among various actions that can be taken to improve rationality in the USA.

Following this thesis, I started by describing what rationality is based on and composed of, how it is being assessed during our decision making processes and how little importance it really has on us to have our decisions aligned with the most accurate epistemic evidence. Exploring the development of decision theory, I found that there is no definitive theory of rationality and even if we make decisions as completely rational agents, sometimes the most rational choice is to be irrational. To explain this finding, I used the theory of rational irrationality as the best available theory to be applied in our case.

Next, I explained how the theory of rational irrationality differs from other similar theories of rationality and why it is the most suitable theory to be used in relation to climate change as an exemplar case for many global issues. I talked about the fact that climate change exhibits certain properties such as time and space distance of its effects, a difficulty to understand or relate to for individuals or the promptness to a number of perception biases. I concluded that people are inherently more likely to make rationally irrational decisions about individual actions concerning climate change, because the expected social benefits of being instrumentally rational (and not behaving personally responsibly towards the planet) are almost always higher than the expected benefits of being epistemologically rational (taking individual action to fight climate change). At the same time, the root causes of this problem are the social incentives and the amount of social rewards a person can reasonably expect for his actions.

Social incentives and social rewards often derive from the values the particular society holds and rewards its members for. This is why five specific “American values” were used in the pursuit of finding out, whether the American nation is inherently more likely to hold rationally irrational beliefs about climate change. In the form of synthesis, these five values (exceptionalism, individualism, religiosity, conservatism and tradition) were found to directly correlate with the specific aspects of rationally irrational behavior, therefore supporting the claim (even though more reliable research in this regard needs to be done).

In conclusion of the research, therefore, I claim that social reward mechanisms are the most important part of decision-making about whether to take individual action towards climate change for American citizens. Therefore, improving the social reward mechanisms is potentially the most effective approach to be taken while aiming to improve rationality in the USA towards increasing global responsibility. In the following paragraphs, I conclude by providing short elaborations on what are the possible objections

to my claims, to the methods and to the theories used in this paper, and what could be the list of priorities of general actions towards improving social reward mechanism in the USA, that should be taken, based on my findings.

5.1 Possible objections

There might be a number of objections directed to each of the previous claims, I will mention only some of the conceptual objections and try to incorporate them into the theory of rational irrationality. Someone might argue, that there is a unusually high amount of charitable giving donated every year in the USA. In fact, "Americans give more to charity, per capita and as a percentage of gross domestic product, than the citizens of other nations." [130] *Giving USA 2015* estimates that individual giving amounted to $258.51 billion in 2014.[131] Unfortunately, it is probably not because Americans are naturally more generous people.[132]

5.1.1 Charitable giving

It seems that high charitable giving is the direct result of laissez faire. American society and the political system allows successful individuals to accumulate excessive wealth. Beyond certain threshold, for these individuals it becomes more beneficial to give part of this wealth away in the form of charitable giving than to keep it for personal profits. For these high-profile donors, the expected utility of keeping those profits would be lower than the expected social benefits of appearing generous to own peers and gaining personal satisfaction from helping others. In other words, above certain level of wealth, expected benefits from feeling of being a moral person and the appearance of being moral, generous and responsible outweighs the benefits of these extra dollars for personal use. It is not to say that only wealthy individuals donate (they are actually likely to donate less % of their income than middle-class individuals), but only the fact that there is a large number of very wealthy people in the USA (due to a relatively wide income gap) alters the national statistics on charitable giving. [133]

This utilitarian expectation of social and personal benefits from charitable giving (which is itself not a bad thing, obviously), is apparent from the fact, that Americans give more donations that other nations (around one third[134]) to churches and religious organizations, with which they usually have very personal relations. I claim, therefore, that the amount of charitable giving doesn't undermine the accuracy of the research or any of the paper´s conclusions.

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[130] *Giving USA 2015: The Annual Report on Philanthropy for the Year 2014* (Chicago: Giving USA Foundation, 2015), 26.
[131] Ibid., 26.
[132] Elisabeth Eaves, "Who Gives the Most?" *Forbes*, December 28, 2008, https://www.forbes.com/2008/12/24/america-philanthropy-income-oped-cx_ee_1226eaves.html (accessed March 28, 2017).
[133] Ibid.
[134] Ibid.

5.1.2 Media and corporate interests

A more important objection can be that the application of rational irrationality to the American society underestimates the role of media, political populism and that of powerful corporate interests. I claim that those are indeed very important factors, but neither of them undermines the accuracy of the concept, it rather strengthens it. An analysis of impacts of each of these three factors on rationality in the USA would be enough material for three more academic studies. Here, I only summarize the main ideas behind these factors from my point of view.

It is evident, that due to high competitiveness and a drive for profit, many American corporate media channels (with the promise of more viewership and thus revenues from advertising) tend to set aside an unconditional loyalty to the truth and use elaborate psychological techniques to draw more attention, for instance, by appealing to people´s emotions and perception biases. Populist politicians offer sound-bites and easy solutions using similar methods. Profit-driven corporations use very effective marketing strategies as well, while they historically have advantageous position in the American political system, being able to lobby for political actions quite effectively.

All these actors are well aware of human tendency to hold rationally irrational beliefs about global issues and, as I hinted in the introduction, it seems that spreading rationality is not in the best interest of any of those actors. For them, the expected utility outcomes are higher if the individual´s abilities to think rationally are lower. The growing gap between their own rational decision-making and public irrationality is seen as comparative advantage and as an effective tool to more easily obtain their goals. The more profitable a corporation (or a political campaign, in effect) is, the higher influence it has on its surroundings and the more error-proof it can become by, for example, hiring more employees and creating new departments to effectively evaluate and assess the expected utilities of any future actions. This structural consequence cannot be changed. What can be changed are the aims for which these structures are heading and the means of influence they have. Considering the growing importance and global power of international corporate bodies, even the small adjustment of their aims (from "90% profit and 10% well-being and sustainability" to "85% profit and 15% sustainability") can make a tremendous difference.

Considering the means of corporate influence on politics, I claim that lobbyism and campaign finance laws in the USA are an urgent problem and restoring restrictions on corporate financing of campaigns in necessary. It is evident that when politicians receive (directly or through Super PACs) large donations for their own campaigns from environmentally unfriendly corporations, they have "strings attached" and as a result, the will of the people is not represented. Apart from the *1976 Buckley v. Valeo*[135] constitutional law which deems limits on spending for political communication to be unconstitutional, the 2010 *Citizens United*[136] Supreme Court decision is the most harmful in this regard. It allows corporations to abide by the same laws as individuals with respect to political expression and, in effect, "legalizes

[135] Buckley v. Valeo, 424 US 1 (1976), U.S. Supreme Court, www.supremecourt.gov (accessed March 29, 2017).
[136] Citizens United v. FEC, 558 US 310 (2010), U.S. Supreme Court, www.supremecourt.gov (accessed March 29, 2017).

bribery and corruption in U.S. politics."[137] For the purposes of raising rationality in the US, this decision should be reversed or overruled most likely by a "Free and Fair Elections Amendment" to the Constitution, which is currently advocated by some political activists in the USA.[138]

5.1.3 Populism

Even without the influence of money in politics, rationality is often not in the best interest of standard, democratically elected political representatives either, because irrational, emotion-based populism has higher expected utility ratio by default. Appealing to populist tendencies often brings more instant political power and more rapid financial gains due to better ideological alignment of interests with the aforementioned for-profit entities. Populism, interestingly, often carries out a less popular urgency of seeing the actual changes and reforms (demonstrating efforts is enough) and it is more prone to effective apologists because the part of the electorate that put populist parties and individuals into power in the first place is naturally more susceptible to irrational explanations, emotional arguments and political propaganda.

There is no viable solution to the nature of populism and to its appeals to generally irrational parts of human reasoning. This notion is essential to the existence of politics and to try to eliminate populism from political processes (by promoting epistocracy[139], for example) would mean to undermine the nature of democracy. The only viable solution of this part of the problem is to change social reward mechanisms by educating, de-biasing and rationalizing citizens, which is an approach ideologically consistent with the theory of rational irrationality. However, here we arrive at the last major objection I encountered. It is about the very essence of rationality. Is rationality always good? Wouldn't it be actually counterproductive to completely rationalize the entire nation?

5.1.4 Is rationality always good?

Behavioral psychology as well as game theory agree that even in the settings with complete information available about all the possible outcomes, human agents sometimes behave irrationally. This actual inability or unwillingness to become completely rational might be an astounding protective feature of the human brain, which doesn't want us to become completely selfish, rational agents. It might also be a lucky coincidence of the imperfect evolutionary processes.

But why is it not advantageous to be 100% rational all the time? By historical and scientific experience, we know that rationality is more apt to be right but is not always so, as we mentioned in the first chapter considering the Newcomb´s problem. When we follow the most contemporary research on

[137] Interview with Jimmy Carter, *The Guardian,* March 1, 2016, https://www.theguardian.com/us-news/2016/feb/03/carter-says-campaign-finance-2010-citizens-united-ruling-legalised-bribery (accessed March 29, 2017).
[138] e.g. the initiative Wolf-PAC, http://www.wolf-pac.com (accessed March 29, 2017).
[139] Jason Brennan, *Against Democracy* (New Jersey: Princeton University Press, 2016).

applied rationality, which is closely related to the area of general artificial intelligence and machine learning, we can see that a hypothetical super-intelligent agent tends to become completely rational and it seems, that implications of this fact can pose nothing short of an existential threat to humanity, many academics claim.[140] When in perfect settings an agent becomes completely rational (while morality, emotions, feelings etc. can all be parts of the equation) it is likely to make decisions resulting in maximum benefit for all actors in, let´s say, 99% of the cases. But maybe because the rational agent can predict scenarios very far into the future (where many good and bad sub-goals need to be accomplished) or simply because we fail to instruct him with a coherent set of values that are important to us, in the 1% of the cases it may end up advocating for quite evil methods in order to reach the most cost-effective outcome by assuming that ends justify the means.

It is necessary to mention this phenomenon, but it doesn´t contradict the theory of rational irrationality either. We will never live in a perfect-information settings and in the real world, we can safely claim that the more rational reasoning we implement while thinking about climate change risks, the better outcomes we act upon and advocate. Due to human emotions, perception biases and the inability to be completely rational, we should care about the risks of extreme rationality only as a safety concern in the development of artificial intelligence, but not in social sciences. A claim that rationality is not always good can be very easily misinterpreted, exploited and taken advantage of. Therefore I claim that advocating for more epistemic rationality (and less rational irrationality) in the American society is unconditionally positive.

5.2 Hope in the future of corporations

Here, talking about increasingly rational agents in the USA, it has been hinted throughout this study that the behavior of large for-profit corporations can be seen as a behavior of highly rational agents. Seeing the growing importance of economic bodies, I want to take a very pragmatic point of view and devote these four paragraphs to discussing whether corporations focusing on global markets can eventually realize that it is in their strategic interest to fight climate change and, therefore, deploy some of the most effective means of improving social reward mechanisms in the USA by creating various incentives or generally redirecting their power towards promoting more sustainable behavior of individual citizens and consumers. I elaborate on this approach because it is a potentially very effective method for improving rationality and I place it among the top approaches in the following list of solutions to be prioritized.

We learned that people are rationally irrational agents, while corporations are more often rational agents, discarding emotions and not being susceptible to perception biases. At the moment, the most influential for-profit entities are becoming more powerful (enhanced rationality seems to pay off) and are employing more resources into the management of growth and strategy, in order to maximize their expected utility (money) and to create a comparative advantage (better planning) over their competitors. A systemic analysis deployed in this paper leads me to believe, that with more money

[140] e.g. Nick Bostrom, *Superintelligence* (Oxford: Oxford University Press, 2014).

invested into information gathering and strategy planning, companies will "see" further into the future and will become more aware of the dangers that global warming and other existential risks pose to the world.

They will, therefore, arrive more often to the rational conclusion that it is more beneficial in a long-term to invest into improving the society in which they operate, set positive examples by promoting social responsibility (not only as a PR strategy and green-washing) and focus on improving more fair relations within and outside of the industry on a global scale (cooperate in situations such as the repeated prisoner´s dilemma). I believe that soon, some global problems will turn out to be urgent enough that it would be costly for corporations not to react to them. At the same time, the over-all amount of information, education and quality of life will alter most social settings enough so that corporations will find it productive to review their strategies or even their whole business models, and the corporations will become even more rational by using general artificial intelligence, for example, to see the effects of their actions further and then change it accordingly (still within their profit goals, but for the good of humanity as well).

It is reasonable to assume, that the further implications of present behavior a rational agent can foresee, the more urgently it will be tempted to align its behavior with the behavior of an agent with the goals of global sustainability and general well-being of humanity (if it doesn't foresee an inevitable catastrophe). In other words, the further for-profit entities can see, the more socially responsible they should become. Therefore, I claim that rationalizing CSR strategies and increasing the ability of corporations to predict further into the future can be one of the most effective ways to improve social rewards mechanisms and therefore promote rationality of American citizens towards climate change.

5.3 Hope in the AI development towards rationality

In a historically unprecedented speed, we seem to be approaching a non-negligible possibility of another existential risk for humanity, which is closely intertwined with understanding rationality as well. While still sounding like a sci-fi scenario to many, the scientific community largely agrees that the Artificial General Intelligence (AGI) will eventually reach the point of singularity (due to Moore´s law[141] and the Law of accelerating returns[142]). At this point, it could quickly transform itself into a super-intelligent agent and very suddenly become able to solve almost any civilization´s problems, but also destroy it if not aligned with human values properly, either intentionally, as an acceptable side effect or merely by accident. Leaving aside all the astounding features of the current research towards AI Safety, it is often

[141] "The number of transistors in integrated circuits doubles every two years." In "50 years of Moore´s law," http://www.intel.com/content/www/us/en/silicon-innovations/moores-law-technology.html (accessed April 27, 2017).
[142] Ray Kurzweil, „The Law of Accelarating Returns," *KurzweilAI,* March 7, 2001, http://www.kurzweilai.net/the-law-of-accelerating-returns (accessed April 27, 2017).

perceived as an extremely radical world-transformation possibility, which is the most urgent to deal with at the moment.[143]

Accepting the high probability that singularity will happen between 10-100 years from now and that a fast take-over scenario could occur, one of the necessary issues to clarify in order to solve the AI control problem is to better understand human values and rationality. Without understanding the real intentions behind every human decision made, it is not possible to teach, direct or predict the behavior of a super-intelligent agent (no matter if it is fully digital, an emulated brain or a digitally enhanced biological brain). Similarly, without understanding the structures in our brain that assign values to different expected outcomes of our decisions, we cannot safely set up a condition where the digital agent has to always respect the complete mixture of human values, because we don't know what this mixture exactly contains. Moreover, some of those values are directly contradicting one another (desiring to have a cigarette while desiring not to desire that) and the beliefs that are both rational and irrational at the same time makes it very difficult for any external, non-human agent to comprehend.

The hope here is that with increasingly well funded research institutions studying rationality, we will come to a more accurate understanding of human rationality and the tools to effectively fight cognitive biases will be developed. The true causality behind decision making will be understood in more detail, crony beliefs will be more easily detectible and, generally, social reward mechanisms will become more epistemologically accurate since the nationwide instrumental rationality and epistemic rationality will be converging rather than diverging in its means. Such an increase of widespread rationality will have a large effect on citizen´s willingness to take individual action to help mitigate global warming as well.

Needless to say, this must happen before the AI takes over the world. If we overcome this extremely complex issue, come to a full understanding of rationality and develop a perfect decision theory to both help ourselves and apply it to control new forms of intelligence, an unimaginably bright future may be ahead of us.

5.4 Ineffective solutions: "think about the kids"

Now, what are the solutions that are likely not to work in promoting widespread rationality? Can we effectively promote the change of social reward mechanisms, for example, only by tenaciously advocating for global sustainability, having enough financial means to do so and using some very effective persuasion techniques? Keeping in mind the findings of this paper, can such a "soft power" approach work?

Simply persuading the mass of people to act upon noble merit beliefs such as the urgency of climate change when the advocated behavior would have almost no expected benefits in a close future is, sadly, ineffective. It is either based on presenting falsely constructed expected utilities or on the request that

[143] "List of the most urgent global issues," *80,000 Hours* (March 2017), https://80000hours.org/articles/cause-selection/ (accessed April 27, 2017).

individuals act out of pure altruism and hold beliefs without any expected benefits. Reasoning for both of these approaches is counterintuitive to our brain and therefore it is not sustainable.

There seem to be many methods that use the "soft power" to persuade people to start behaving responsibly about climate change. Environmentally responsible behavior can mean anything from sorting plastic bottles, saving energy, installing solar panels, using public transportation, buying cars with low emissions or eating less meat, all the way to donating to environmental charities, spreading the word or being politically active in green movements.

In advocating for global responsibility, the most usual argument is "think about the kids". The future of one´s own kids is very valid, positively emotionally charged, morally strong argument that people can easily relate to. Even then, however, it is not very effective, because it doesn't hold to the counter-argument, that every action of an individual person is globally negligible. Therefore, it is more cost-effective *not* to take action, save the resources (money, time, energy) and accumulate these resources (or their outcomes) over time in order to build a comparative advantage for one´s own kids.

As the rationalization process might go, this comparative advantage (more money, better educational options, happier family etc.) will not only help the kids but by making them more advantaged and better-off, it will make oneself more likely to be taken care of in the future (kid´s responsibility for the old parents). In other words, why be so concerned about the next generation, when one can do much more good for my own kids, whom he or she actually cares about much more. This is not an epistemologically correct approach but it is understandable and instrumentally rational, utilitarian and a pragmatic reasoning which human brains are naturally so good at. On this level of thinking, the large consequences of climate change or apocalyptic implications of existential risks are simply not quantifiable and comprehensible enough for us to include them as a factor during our reasoning process.

5.5 Proposed solutions

The epistemic benefits for individuals concerning climate change are not possible to invent and to for-profit entities, providing financial incentives to its customers to behave environmentally responsibly is often in conflict with their primary goal of profit. The predictive power (rationality) of corporations and the corporate social responsibility is growing slowly (as mentioned in the previous chapter). At the moment, financial incentives usually need to come from the political sphere and it requires strong political action towards epistemic rationality and global awareness and sustainability, which, in relation to the USA, is statistically unlikely to expect from the contemporary Republican-led congress and the Trump´s presidency.

Therefore, there are basically two viable paths. Either to support creating products that are cheap and at the same time environmentally friendly (which is a difficult task) or investing in improving social reward mechanisms, so that people realize that they will be rewarded by the society for holding and actually acting upon epistemologically accurate merit beliefs. The prior can be done by supporting the

development of new technologies, while the latter could be effectively processed by NGOs, schools, media or churches (promoting climate change mitigation as highly positive transcendent value and incentivizing the church community to reward its members for it), so that there is not much political effort necessary, because in general, political action requires the will of the voters, who are rationally irrational in the first place.

Improving social reward mechanisms also has a potential for large spillover effects. Instrumentally rational agents will behave the same way they do now until the social settings change the expected utilities in a large enough scale for them to reconsider their "business strategy". It is, in fact, very intuitive concept. If a car manufacturer realizes that the values of people are changing towards accepting climate change and that there is a statistically non-negligible amount of potential customers that are becoming conscious or socially pressured enough to start behaving based on those facts (buying an electric car), the car manufacturer will swiftly consider investing in the electric car research.

Here, I introduce a list of general measures that, I claim, have the potential to raise epistemic rationality towards climate change in the USA, if funded and processed properly. The order of methods in the list is based on my understanding of their importance (most urgent and applicable first), but all these methods should be applied concurrently. All of these methods can have large leverage effects on one other, as well.

5.6 List of general measures to be prioritized

1. priority: Educate

    - Teach methods of rationality to students in elementary schools and high schools.
    - Educate society to be, in effect, more likely to reward its peers for merit beliefs.
    - Raise awareness of cognitive biases among the general public in a comprehensible way.

2. priority: Learn

    - Develop more effective ways to find out which of our beliefs are crony beliefs (and they mimic merit beliefs), for example by deep neural research or AI-driven technologies.
    - Scientifically explore the roots of global issues, effectively prioritize between solutions.
    - Increase the ability of for-profit agents to predict further into the future.

3. priority: Innovate

    - Create new social and economic incentives for acting individually upon merit beliefs.
    - Develop new technologies that are both economically and environmentally effective.
    - Support new approaches to social entrepreneurship and effectively assess its impacts.

4. priority: Securitize

    - Diminish the influence of highly rational, profit-driven economic actors on politics.

- De-bias information channels and make fact-checking intuitive and easily accessible.
- Develop and advocate for secure development of AI, better aligned with human values.

5. priority: Rationalize

- Promote decision making based on rational compassion rather than emotional empathy.
- Fight moral cheering by nudging - setting new norms and punishing norm transgressors.
- Motivate elites to push through and advocate for these more effective moral norms.

6. priority: Moralize

- Normalize the philosophy of effective altruism and the implications of its concepts.
- Advocate for the value equality of all human lives and suffering on the planet.
- Promote the notion of global citizenship.

Souhrn

Diplomová práce se zaměřuje na zkoumání příčin zdánlivě iracionálních postojů části americké veřejnosti k významnosti lidského vlivu na globálním oteplování a k jeho existenci jako takové. Práce vychází ze předpokladu, že přibližně 95% vědecké komunity považuje globální oteplování za významný problém, zatímco jen přibližně 50% občanů to vidí stejně. Teorie racionální iracionality je použita pro kauzální analýzu tohoto fenoménu. V návaznosti na uvedení do problematiky teorie rozhodování (1. kapitola) a vysvětlení principů racionální iracionality (2. kapitola) autor zjišťuje, jak je tato teorie aplikovatelná na globální oteplování (3. kapitola) a jestli lze touto teorií vysvětlit zmíněné postoje americké společnosti (4. kapitola).

Cílem práce je zodpovědět tři zásadní otázky: „Je pro člověka instrumentálně racionální přehlížet globální oteplování?“ „Jsou Američané více iracionální než jiné národy v tomto ohledu?“ Pokud ano, „vychází tato vlastnost z určitých zakořeněných společenských hodnot utvářejících tzv. americkou identitu?“ Argumentujíce za pozitivní odpovědi na tyto otázky, autor jmenuje pět základních „amerických hodnot“ a hledá korelaci a kauzalitu mezi těmito hodnotami a statistickými výsledky řady empirických studií potvrzujících neobvykle vysokou nedůvěru občanů USA k vědeckým poznatkům o globálním oteplování a neochotu přizpůsobit vlastní aktivity boji s tímto problémem.

Závěrem práce je zjištění, že překvapivě důležitou roli v utváření názorů na globální problémy hraje sociální prostředí jednotlivce v USA a že jednou z hlavních příčin tohoto fenoménu jsou špatně nastavené „mechanismy sociálních odměn“ ve společnosti. V rámci těchto mechanismů je jedinec odměňován za instrumentálně racionální chování, které je ale často nezodpovědné ke globálním problémům. Autor v závěru navrhuje sadu obecných doporučení, které mají potenciál zvýšit epistemickou racionalitu ve společnosti právě pomocí zdokonalování mechanismů sociálních odměn. Systematická snaha o zvyšování racionality se zdá být velmi příhodná i s ohledem na společenské dopady takzvané post-faktuální éry prezidentství Donalda Trumpa.

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