

**THE GAP BETWEEN WANTING AND CHANGING
A LITERATURE REVIEW OF THE BEHAVIORAL AND PSYCHOLOGICAL
BARRIERS THAT HINDER PRO-ENVIRONMENTAL ACTIONS**

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**LA BRECHA ENTRE QUERER Y CAMBIAR
UNA REVISIÓN DE LA LITERATURA DE LAS BARRERAS CONDUCTUALES Y
PSICOLÓGICAS QUE OBSTACULIZAN LAS ACCIONES PROAMBIENTALES**

Abstract

Research in the fields of psychology and behavioral economics have shown that the difficulties of effective pro-environmental actions are not only due to structural barriers or unsuccessful international cooperation but of deterrents innate of human nature. Fortunately, these fields have also provided theories —such as Ajzen’s Theory of Planned Behavior or Kahneman’s System 1 & 2— that deepen our understanding on the subject. Tools —like the ones used in choice architecture—, paired up with these concepts, offer practical information that open opportunities for private and public policies on the subject of climate change’s prevention and mitigation actions.

Keywords: *behavioral economics, choice architecture, psychology, climate change, global warming.*

Resumen

Las investigaciones en las áreas de psicología y economía del comportamiento han demostrado que las dificultades de acciones pro-ambientales efectivas no solo se deben a las barreras estructurales o la cooperación internacional infructuosa, sino a elementos disuasivos innatos de la naturaleza humana. Afortunadamente, dichas áreas han proporcionado teorías —como la Teoría del Comportamiento Planificado de Ajzen o el Sistema 1 & 2 de Kahneman— que profundizan nuestra comprensión del tema. Herramientas, como las utilizadas en la arquitectura de la elección, ofrecen información práctica que abre oportunidades para políticas públicas y privadas sobre los retos del cambio climático.

Palabras clave: *psicología, economía del comportamiento, pro-ambiental, arquitectura de la elección, cambio climático.*

INTRODUCTION

It is not uncommon now to hear people are concerned about climate change. As stated by Gifford (2011), most people are aware that climate change and sustainability are important

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problems and yet too few are engaged in effective behaviors to mitigate the causes of the given issue. It is also said by Falkner (2016), that even with the creation of international treaties such as the Kyoto Protocol, emissions of the main greenhouse gases have increased over time. At first glance both of these statements may seem as contradictory. Why is it that if human beings want to help the environment so badly, too few are actively changing their behavior for the better of this world? Is it just about structural barriers and ineffective international cooperation or is there something more? And, if there is more—which there is— what is the role and scope of behavioral economics and psychology in this particular problem?

The following literature review seeks to explain the main psychological barriers faced when thinking about climate change. Such impediments are under the assumption that structural barriers are partially or completely absent and that human beings do not always behave in a homo-economicus way. The methodology for this text follows the research of theories on behavior since 1991 (Ajzen's theory), studies and examples up to 2018 and news, data, public announcements and theories up to 2019. It encompasses the main findings and information on the psychological barriers to pro-environmental behavior with the purpose of providing a structured scope of the problem and solutions at hand researched and experimented by some of the most prominent names and figures on the subject.

The following article considers the meaning of global warming and climate change and the international cooperation context. This, in order to understand the magnitude of the issue and the problems that go as deep as the evolutionary process of the human mind. The theories, barriers and the solutions are both researched on the field of psychology and behavioral economics—making choice architecture a concept of interest—. Additionally, Mexico's particular standpoint on climate change's prevention and mitigation actions as well its' status on their promises of the Paris Agreement are commented and discussed.

THE CONCEPT AND THE INTERNATIONAL CONTEXT OF CLIMATE CHANGE

The conflict regarding climate change starts from the very definition of the word and, as we'll see further in the text, wording/labeling actually affects behavior in a significant way. According to NASA (2018), climate change and global warming are not the same thing.

Global warming refers to the long-term warming of the planet since the early 20th century, and most notably since the late 1970s, due to the increase in fossil fuel emissions since the Industrial Revolution (NASA, 2019, n.p.).

Climate change refers to a broad range of global phenomena created predominantly by burning fossil fuels, which add heat-trapping gases to Earth's atmosphere. These phenomena include the increased temperature trends described by global warming, but also encompass changes such as sea level rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and extreme weather events (NASA, 2019, n.p.).

Although it may seem as an unimportant matter, to some people, the confusion and uncertainty of climate change stems from the definition and has even raised “arguments” to dismiss the importance of the issue. As stated by Donald Trump in one of his tweets:

In the beautiful Midwest, windchill temperatures are reaching minus 60 degrees, the coldest ever recorded. In coming days, expected to get even colder. People can't last outside even for minutes. What the hell is going on with Global Warming? Please come back fast, we need you! (Trump, 2019).

Such political standpoints from the leader of the world's biggest economy (IMF, 2019), has also put a strain on international cooperation.

International cooperation regarding climate change is not particularly new. Ever since 1992, organizations such as the United Nations have sought to arrest this problem. The objective of the UN Framework Convention on Climate Change (UNFCCC) was to prevent “dangerous human-induced climate change by stabilizing greenhouse gases (GHG)” (Falkner, 2016, 1108). After that, came the Kyoto Protocol in 1997, along with the Clean Development Mechanism. But, as said by Falkner (2016), despite these efforts “emissions of the main GHGs (carbon dioxide, methane and nitrous oxide) rose steadily over this period” (Falkner, 2016, 1108). Then, years later, came the Copenhagen conference in 2009, which wanted to make a better job regarding this problem than the Kyoto Protocol. Such wants never came to pass. This led many people to question international cooperation on climate change according to Falkner (2016). Then, 7 years later, the Paris Agreement 2016 went into action, and a positive outlook on the problem was again envisioned (Falkner, 2016).

And yet, the Paris Agreement has not been as effective as it was originally thought to be. Only two out of the 195 countries in the agreement are partaking actions to meet the standard of 1.5°C rise in world temperature, being these countries Morocco and Gambia. Under 2°C, only five countries: Bhutan, Costa Rica, Ethiopia, India and the Philippines (Erickson, 2018). That is, only 3.5% of all the countries that pledged to maintain their emissions and pursue actions to prevent a rise in global temperature above 2°C are actually doing so. This is very alarming since even with the 1.5°C and 2°C goal, climate-related risks to health, livelihood, food security, water supply, human security and economic growth are to increase (IPCC, 2018). According to the Intergovernmental Panel on Climate Change 2018's report:

Adaptation is expected to be more challenging for ecosystems, food and health systems at 2°C of global warming than for 1.5°C (medium confidence). Some vulnerable regions, including small islands and Least Developed Countries, are projected to experience high multiple interrelated climate risks even at global warming of 1.5°C (high confidence) (IPCC, 2018, 12).

International cooperation on climate change is obviously not working as it should, and we are running out of time (Erickson, 2018).

MAIN THEORIES ON BEHAVIOR SEEN AS A MORAL, PSYCHOLOGICAL AND BEHAVIORAL ISSUE

There is much literature around the theories of pro-environmental behavior and what drives it. Many authors have taken for themselves to research on this subject and some have come up with different theories and explanations. As seen in the literature, there are three points of view that take the issue of human's behavior toward climate change—or other subjects for that matter—: the moral, psychological and behavioral standpoint. It is important to emphasize that the two most relevant theories for this text specifically will be 1) Theory of planned behavior by Icek Ajzen and 2) System 1 and System 2 by Daniel Kahneman. The other theories: NEP, Value Belief Norm and Moral Foundations Theory will be shortly discussed in order to provide an objective scope of the literature available on the subject.

Theory of planned behavior

Icek Ajzen is a social psychologist from the University of Massachusetts Amherst, best known for his Theory of Planned Behavior, which is “a theory designed to predict and explain human behavior in specific contexts” (Ajzen, 1991, 181). Ajzen states that the intention of behavior is determined by the attitude toward the specific behavior, the social norms, and the perceived behavioral control over the issue. He emphasizes that these three determinants are independent in their conceptual meaning and that together they “account for a considerable variance in actual behavior” (Ajzen, 1991, 179).

Attitude toward behavior takes into consideration the evaluation or appraisal for the action to take. Social norms are about the pressures of our society to do or not to do the given behavior. Perceived behavioral control, the last of the three, is the level of difficulty, as well as the control we think we have over the situation. This theory then, under the climate change problematic, is of great interest because climate change possibly poses a challenge on all three of the determinants of intention and furthermore, behavior. How we think about climate change, the social construct on whether or not we are pressured to really act on the problem, the control we perceived about this “world ending issue”, it all matters. Moreover, all these determinants end up in how we behave as individuals and as a society.

NEP (New Ecological Paradigm)

The New Ecological Paradigm (NEP) scale, which is sometimes referred to as the revised NEP, is a survey-based metric devised by the US environmental sociologist Riley Dunlap and colleagues. It is designed to measure the environmental concern of groups of people using a survey instrument constructed of fifteen statements (Anderson, 2012, 260).

Although it's said that “it is probably the most widely used measure of environmental values or attitudes, worldwide” (Anderson, 2012, 261), others have stated that it is “folk ecological theory” (Jansson & Dorrepaal, 2015, 385) and that even though it has been found valuable in explaining variations in behaviors and norms, the relationship between how people view the world and how they actually act has not been strong (Jansson & Dorrepaal, 2015).

However, the New Ecological Paradigm seems as an important measure to state in this text because it is still used extensively in many areas —although a need for validity and reliability is dully needed—, probably because it has been accepted worldwide since early on and serves as a comparison across studies, populations, and time (Anderson, 2012).

Value Belief Norm

Perhaps one of the most appreciated theories that helps explain why people act or do not act in environmental ways is Stern's Value Belief Norm Theory (VBN). "The theory links value theory, norm-activation theory, and the New Environmental Paradigm (NEP) perspective through a causal chain of five variables leading to behavior" (Stern, 2000, 412).

The Value Belief Norm Theory starts with the personal values (biospheric, altruistic, or egoistic). This then leads to beliefs (which include the Ecological worldview from the NEP, the adverse consequences for valued objects AC, and the Perceived Ability to reduce threat AR. Which, of course then leads to Pro-environmental Personal Norms (which is a sense of obligation to do environmental actions). Finally, arriving at behaviors (being these either activism, non-activist public sphere behaviors, private sphere behaviors, behaviors in organizations) (Stern, 2000).

Moral Foundations Theory

Moral Foundations Theory was created by a group of social and cultural psychologists to understand why morality varies so much across cultures yet still shows so many similarities and recurrent themes. In brief, the theory proposes that several innate and universally available psychological systems are the foundations of "intuitive ethics." Each culture then constructs virtues, narratives, and institutions on top of these foundations, thereby creating the unique moralities we see around the world, and conflicting within nations too (Moral Foundations, 2016, n.p.).

The five foundations are: care/harm, fairness/cheating, loyalty/betrayal, authority/subversion and sanctity/degradation. These foundations all have an evolutionary explanation (Jansson & Dorrepaal, 2015) and might then explain why it is common to find these in every culture, given of course, their different representations and customs of these foundations.

In the climate change issue, these foundations were used in the study of Jansson & Dorrepaal (2015) "since climate change has been argued to be a social dilemma (see, e.g., Capstick, 2013) and since morality is about how individuals relate to each other, it becomes important to relate MFT to personal norms and examine how these interact with other attitudinal factors in order to clarify relationships in the sustainability domain" (Jansson & Dorrepaal, 2015, 384). They found out there is a positive association between personal climate change norms and harm and fairness. They conclude that more emphasis should be made in the other three.

System 1 and System 2

David Kahneman, Nobel Prize in Economics, states in his book *Thinking, Fast and Slow* (2011), that there are two main systems by which we act. Although the term is not originally his but from psychologists Keith Stanovitch and Richard West, System 1 and System 2 are very much associated with Kahneman's work. He says that in our minds, two systems exists: System 1, which "operates automatically and quickly with little or no effort and no sense of voluntary control" (Kahneman, 2011, 20), and System 2 which "allocates attention to the effortful mental activities that demand it, including complex computations. The operations of System 2 are often associated with the subjective experience of agency, choice and concentration" (Kahneman, 2011, 21).

Richard Thaler, also a Nobel Prize in Economics, names them automatic system and reflective system. As he states it in his book *Nudge: Improving Decisions about Health, Wealth and Happiness* (2008), the automatic system refers to the uncontrolled, effortless, associative, fast, unconscious and skilled part of ourselves, while the reflective system is controlled, effortful, deductive, slow, self-aware and rule-following (Thaler & Sunstein, 2008).

As said by Kunreuther & Weber (2014), David Kahneman's System 1 and System 2 is based on "a large body of cognitive psychology and behavioral decision research" (Kunreuther & Weber, 2014, 5-6). This helps us understand better how is it that we humans actually behave in the real world, or at least in a world that is more based in reality than the one a homo economicus inhabits. This is relevant to climate change because, as we will see in the next section of psychological barriers, there are a bountiful amount of behaviors that are not done using System 2, but that rather operate automatically which poses both a threat and an opportunity in the climate change issue.

PSYCHOLOGICAL BARRIERS

When we think about what prevents people from acting against climate change, structural barriers are probably the first to come to mind. Low income, urbanization and weather are some of the variables that, given any country, could provide barriers against prevention and mitigation actions regarding climate change (Gifford, 2011).

However, as behavioral economics and psychology lets us know, structural barriers are not the only thing that prevents us from acting in an effective matter. Psychological barriers, some that stem from the very evolution of humankind, also affect the way we think and act on climate change (Gifford, 2011). To understand what some of the most commons psychological barriers are on this particular topic is very important since both business and public policies could benefit from knowing the correct incentives that make people act in favor of the environment.

The literature around psychological barriers on climate change is frequently repetitive in a general sense but structured and separated differently by most of the authors. In this text we will review the general idea of the most common psychological barriers as well as state some practical solutions in the next segment.

Ignorance

Ignorance is probably the first barrier to arise when talking about climate change. “For a proportion of the population, ignorance of climate change may be a barrier to action” (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011, 65). If people either don’t know about the subject or don’t understand which practical actions to take, it is most likely for them to remain passive.

Uncertainty/ Mistrust and reactance

It is frequent to get different climate change related information and reports that, overall, run the risk of creating uncertainty over a given population. This is a problem because uncertainty has been reported to reduce pro-environmental behavior but this has a graver effect because it’s not only that people have genuine doubts but also that “uncertainty about climate change probably functions as a justification for inaction or postpone action” (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011, 65).

Moreover, people might see environmental policies with mistrust and so feel reactant to green initiatives if their government has a bad reputation or is known to be corrupt (Stoll-Kleemann, O’Riordan, & Jaeger, 2001). “Trust, on the other hand, is important for changing behavior, particularly when a person believes that change involves a cost” (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011, 65).

Denial/Dissonance:

In literature review, denial and dissonance is a very well documented psychological barrier. In relation to the topic “this could be denial of the existence of climate change and human contribution to climate change and could include more specific denial of the role that one’s behavior or one’s group’s behavior has in harming other” (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011, 65).

Some of the denial mechanism were showed as blaming others —such as governments or big companies—. Dissonance is explained by some authors as “the inconsistency between beliefs and behaviors” (Johansson-Stenman & Brekke, 2008, 19). Such mechanism “causes uncomfortable psychological tension, sometimes implying that people change their beliefs to fit their behavior instead of changing their behavior to fit their beliefs (as it is conventionally assumed)” (Johansson-Stenman & Brekke, 2008, 19).

Actually, the empirical evidence provided by a swiss focus group, showed that “the most powerful zone for denial was the perceived unwillingness to abandon what appeared as personal comfort and lifestyle-selected consumption and behavior in the name of climate change mitigation” (Stoll-Kleemann, O’Riordan, & Jaeger, 2001, 113) —this, otherwise known as following the status-quo will be seen ahead—.

Habit/Status-quo/Self-serving bias/Conflicting goals and aspirations:

As it was stated before in this text, most of the literature on psychological barriers related to climate change is often-times repetitive in its concepts and meanings in a general sense—which may not be the same in a detailed manner—. So, for the sake of this text what some authors call habit (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011) it will also be known by others as following the status-quo (Gifford, 2011), (Johnson, et al., 2012), (Weber, 2015), (Thaler & Sunstein, 2008). These are known as psychological barriers because it's documented that people tend to prefer the status-quo than actual change since change is very much related with uncertainty and risk—something people don't normally like to experience—. Habit and status-quo are a problem for climate change because effective prevention and mitigation actions requires people to change their current consumption and behavior in order to reduce the emissions of the green-house gases.

Also, researchers have found out that there is a self-serving bias that humans tend to act upon. That is, they act on their own interest, either conscious or unconsciously. For example, “when facts or principles are ambiguous, we tend to pick the ones that favor our own self- interest” (Johansson-Stenman & Brekke, 2008). And it's true that even though people might want to help in the problem against climate change, conflicting goals and aspirations arise, which also forms a sort of cognitive dissonance because maybe someone is aspiring to a certain lifestyle (the big house, the expensive cars, travelling around the world, etc.) but is also aware this harms the environment and so their beliefs and their behaviors clash.

Perceived behavioral control and social norms

As it was stated in the previous segment, although used primarily in psychology and not in economics, The “Theory of Planned Behavior” by Icek Ajzen (1991) talks about the three variables that affect intention to act and, as it turns out, most authors—both from psychology and behavioral economics— either name perceived behavioral control or some form of social norms as part of their list in the psychological barriers of climate change.

In “Dragons of Inaction: Psychological Barriers that Limit Climate Change Mitigation and Adaptation” perceived behavioral control is explained as a part of the barrier of limited cognition which stems from the evolutionary nature of the human being as having to stay focus on the immediate threats but also in their own control (Gifford, 2011). Other authors explain this concept as perceived self-efficacy (Schwartz & Loewenstein, 2017) which, if deemed as inefficient, is likely to result in a passive state.

Social norms have been found to have an important role on actions against climate change. Since human beings are social beings, we seek to others to see what they expect of us in order to know how to act. For example, in the article “One Bad Apple: Contagion and Differentiation in Unethical Behavior”, the authors found out—through empirical evidence—that “people react to the unethical behavior of others, and that their reaction depends on the social norms implied by the observed dishonesty and also on the saliency of dishonesty” (Gino, Ayal, & Ariely, 2009, 397). They also found out that differences in the calculations of cost-benefit analysis didn't really changed their behavior and that when an in-group member acted dishonestly, cheating increased. This is relevant to climate

change because if social norms are not aligned —or changed— to favor prevention and mitigation actions it won't be possible to help the environment in an effective way.

Communication (Inefficiently described options and evoked emotions)

Although it may be understated by some, ineffective communication regarding climate change is both a problem and a solution in the topic at hand. The problem arises from being misused by many when doing climate change ad's, public policy initiatives, and campaigns (Schwartz & Loewenstein, 2017).

Some authors state that options are badly described by several actions: naïve allocation — which means that limited resources are allocated in a bias manner—, attribute overload — that is overemphasizing the attribute of something—, and non-linear attributes —which goes against some economic assumptions— (Johnson, et al., 2012).

There is, of course, another misused tool when it comes to communicating climate change: emotions. Emotionally evoking ads are not new and yet, it is said that some can even have counterproductive results because of the emotion they're evoking in the viewer (Schwartz & Loewenstein, 2017). The authors of "The Chill of the Moment: Emotions and Pro-environmental Behavior" explain that not all emotions are effective in making the viewer engage in pro-environmental behavior. For starters, the discrete emotions that should not be incentivized are fear —which mixed with low perceived behavioral control leads to withdrawal from the situation—, anger —which leads to passive action while blaming others— and disgust —which is also counterproductive for policy support—. The "right" emotions will be discussed in the solution segment of this text.

Loss aversion and sunk costs

A psychological barrier that is often also named is that of loss aversion and sunk costs. The text "The Behavioral Economics of Climate Change" mentions that people "feel" more when they lose something than when they gain it (Johansson-Stenman & Brekke, 2008). This comes into play with climate change because many of the behavioral changes that need to be done in order to create a more sustainable planet face a sunk cost —such as installing a solar panel on you house—, which is also something people tend to try to avoid (Gifford, 2011).

Judgmental discounting

Judgmental discounting is listed as a psychological barrier by many authors (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011), (Gifford, 2011), (Johansson-Stenman & Brekke, 2008). Although this is not a new topic by far, judgmental discounting, seen in relation with climate change "means discounting the importance of climate change in temporal and spatial terms" (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011, 66). That, they mean to say, is that research has showed that people tend to justify their passiveness by thinking that changes can be made later (temporal) and that, even though climate change will bring devastation, people usually believe that the effects of climate change will be worse somewhere else (spatial), even when these places are very similar and nearby. This spatial discounting also creates

inaction (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011).

Beliefs/Ideologies

Ideologies, as one of the psychological barriers, refers to worldviews that may be counterproductive to prevention and mitigation actions against climate change. This means the belief that for example, some deity like Mother Nature will prevent Earth from catastrophe (otherwise known as suprahuman powers), or that technology will somehow be the solution for climate change (technosalvation), or the belief that things are the way they are and that it's impossible to change them (system justification) (Gifford, 2011).

Tokenism/Limited Behavior/Rebound effect

Last but not least, research has also found out that even after some of the barriers have been toppled down and people are now engaging in pro-environmental behavior, some might still be doing the bare minimum, which some authors call it limited behavior (Gifford, 2011), while others tokenism (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011). That is, people use one or few particular action(s) that is(are) actually ineffective in reducing climate change but in doing so, they're able to stabilize their emotions and feel as though they're engaging in effective pro-environmental behavior.

The other issue with people that have started to act in favor of the planet is that they may be tempted to have a rebound effect, in “which after some saving or effort is made, people erase the gains” (American Psychological Association Task Force on the Interface Between Psychology & Global Climate Change, 2011). For example, someone that became vegetarian for a week and then ended up consuming more meat in a regular basis than he would've done before that leap into pro-environmental action.

SOLUTIONS TO PSYCHOLOGICAL BARRIERS

Psychological barriers on climate change pose a challenge for many disciplines that seek to change the current and future crisis we face in our world. The literature on the subject, however, sheds a light on possible solutions to overcome such barriers. Psychological knowledge as well as choice architecture—which is a way to influence choice by managing the way and the context information is showed (Thaler & Sunstein, 2008)— and furthermore, the use of nudges—which means “any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler & Sunstein, 2008, 6)— are just a part of the puzzle, but a vital one at that. The following are some of the solutions found by researchers and experts on the field:

Use social norms

Although social norms can be part of the psychological barriers—if society does not value or frowns upon pro environmental behavior—, they are also part of the solution. That is, of course, if society demands or values people that are “green”, which fortunately has been

a trend in recent times. That means that one possible solution would be to accentuate this factor as giving consumers something to “show” they are green. A great example is explained in the book “Nudge: Improving Decisions About Wealth, Health and Happiness (2008): “One reason that the Toyota Prius has been so successful compared with other hybrid cars is that the Prius is sold only as a hybrid (unlike, say, a Camry, which is sold in both conventional and hybrid versions). People who want to signal their green credentials are much happier in a Prius than a hybrid Camry because no one will know that the Camry is a hybrid unless she carefully examines some labeling on the car” (Thaler & Sunstein, 2008, 192). Other authors (Stoknes, 2014), (Gino, Ayal, & Ariely, 2009) also accentuate the use of social norms as a way to change behavior for the better of the environment.

Increase perceived behavioral control

Another of the variables from the Theory of Planned Behavior by Icek Ajzen (1991), perceived behavioral control, could also mean a solution—if used correctly—for the issue of climate change. The article “Yawning at the Apocalypse” (2018) proposes that, in order to reduce psychological distance, —policies, for example—, should focus on thinking at a global scale but acting in the details. By these, the authors mean concrete local impacts and opportunities to help the environment (Brik & van der Linder, 2018) which could also, in theory—and with the right message—, help increase perceived behavioral control.

Storytelling

Stories have a lot of power when it comes to influencing behavior and so should certainly be used in climate change communications (Stoknes, 2014). Yet, what story should we tell? In the article “Rethinking climate change communications and the ‘psychological climate paradox’” (2014), it is explained that the usual story surrounding climate change is actually counterproductive, since it is usually referred as apocalyptic which accentuates lack of perceived behavioral control and dissonance/denial because of fear mechanisms. Knowing that, the solution becomes a bit clearer: positive stories about renewal of wildlife and ecosystems in our environments (Stoknes, 2014).

Another important piece in storytelling should be that of a “good” government. It is common for citizens to mistrust new environmental policies and even more so if the government lacks credibility. In order to have people accept policies in favor of the environment, according to the paper “The psychology of denial concerning climate change mitigation measures: evidence from Swiss focus group” (2001), “governments have to appear united, credible and persuasive over the issue of climate change mitigation and adaptation measures. Citizens need political cues and clear leadership from their elected representatives, that are consistent, purposive and progressive” (Stoll-Kleemann, O’Riordan, & Jaeger, 2001, 116).

As a note on the subject, storytelling regarding climate change should also have its focus on the experience of the consumer (Johnson, et al., 2012).

Use the “right” emotions at the “right” time

As said in the sixth psychological barrier—and in relation to System 1—, the emotions used to communicate climate change, either in the context of a policies, campaigns, or ads,

goes a long way in affecting how a person behaves after that message. The reality is that, although this should be known to the people that are in charge of communicating such messages, many times, the problem evokes the “wrong emotions”. That is why, the authors of “The Chill of the Moment: Emotions and Pro-environmental Behavior” (2017) found out that the “best” emotions to evoke are concern and sadness. This is because concern fuels green policy support and sadness—which is the one recommended by the authors—, guides people into action since “sadness causes people to try to improve their current circumstances” (Schwartz & Loewenstein, 2017, 8), which means that people tend to act more in order to somehow regulate their emotional state. This, however, needs to be paired with a “call-to-action” when emotions are running high which, as it has been tested, high emotions do not last very long.

Literature on provoking behavioral change at the “right” time state that, for example, in California, residents bought more earthquake insurance just after they had experienced severe earthquakes in their homes, but after a couple of years of no catastrophes, earthquake insurance dropped (Kunreuther & Weber, 2014, 11). Solutions need to be presented when emotions are high since, likely due to evolution, human emotions over a situation tend to weaken over time and this means that “there may only be brief windows of opportunity for promoting constructive action or changing deconstructive patterns of behavior” (Schwartz & Loewenstein, 2017, 3).

Make it easy

Though this may seem as a logical solution, the truth is that removing dissonance, changing the status quo and the habits of people—as seen in the psychological barriers—is not as easy as it seems. That is why, “to avoid dissonance and maintain supportive attitudes, it is important that as many as daily actions as possible are consistent with climate change knowledge, while not demanding too much extra effort since the breaking of habits is a demanding task” (Stoknes, 2014, 14). Other authors also support the idea of “making it easy” by proposing to “facilitate more affective and experiential engagement” (Brik & van der Linden, 2018, 35), customize information, use decision staging and reduce the number of alternatives—to avoid having people overload with alternatives—and use technology as decision aids—such as e-commerce already does when browsing online— (Johnson, et al., 2012).

Framing

One of the most common solutions found in the literature of the subject is framing. Framing “is a feature of our brain's architecture. Our minds react to the context in which something is embedded, not just to the thing itself” (Shpancer, 2010, n.p.) which means that choice architects can influence behavior through this tool. “Furthermore, framing works because people tend to be somewhat mindless, passive decision makers. Their Reflective System does not do the work that would be required to check and see whether reframing the questions would produce a different answer” (Thaler & Sunstein, 2008, 37). The importance of framing stems from “the idea is that choices depend, in part, on the way in which problems are stated. The point matters a great deal for public policy” (Thaler & Sunstein, 2008, 36). As said by some researchers, policy solutions should be framed in terms of expected benefits (Brik & van der Linden, 2018). This solution is also very related

to storytelling and emotions since it is said it's important to not frame climate change as a catastrophic event unless it is followed by "effective actions to take, because audiences otherwise might switch off or become numb to the message" (Stoknes, 2014, 5). That is, deep framings of positive and supportive action.

Labeling

An empirical evidence explained in the article "Climate Change Demands Behavioral Change: What Are the Challenges?" (2015), emphasizes the importance of labeling by stating an experiment that was made about asking people if they were willing to pay for a carbon tax or carbon free plane —some were asked with carbon tax and other with carbon free. The results showed that 67% of the people were willing to buy a carbon-use free plane while 27% of the Republicans opted out of willing to buy it if it said carbon tax. These results could be considered as a massive change in consumption if we stop to think about the fact that the only change that was made was a simple word. "Beyond nudges: Tools of a choice architecture" (2012) also shows labeling as a possible solution for choice architecture to avoid the psychological barrier he calls attribute overload.

Change the status quo through defaults

The fact that psychological barriers have been discovered by researchers and experts of the field is not just to state the problems that are present over the issue of our environment. Our own psychological barriers, when used in an effective manner, can actually help us in the fight against climate change. Such solution is described in the book *Nudge: Improving Decisions About Health, Wealth, and Happiness* (2008): "The combination of loss aversion with mindless choosing implies that if an option is designated as the "default," it will attract a large market share. Default options thus act as powerful nudges" (Thaler & Sunstein, 2008, 35). This would mean to say that stating something as a direct or indirect default — that is the new status quo— can go a long way. That could be pretty much about anything such as stating and, in any subject as well —not just climate change— such as organ donation and insurance (Kunreuther & Weber, 2014). Other authors also provide this solution as a means to stop decision inertia (Johnson, et al., 2012).

Give Feedback

One of the reasons that authors state as to why it is difficult for people to change their behavior is because they don't get the feedback in an effective manner: that is by the proper information presented to them and in a timely fashion (Thaler & Sunstein, 2008) and so, not having feedback lets people underestimate the effects they have on climate change. However, if feedback is done in an effective way, the solutions seem very promising. One of the greatest examples to state the positive effects of feedback, but also social norms is that of OPOWER, a company that lets its' clients know about their consumption but also the consumption of the people around them. Results of the OPOWER company have been used by many in literature (Thaler & Sunstein, 2008). Another reason to give feedback is to indicate and monitor progress (Stoknes, 2014).

Sanctions or no sanctions?

As in many subjects, the literature around the proper solutions for psychological barriers regarding climate change is sometimes subject to debate. As we will see also in the next solution: Economic benefits or environmental benefits, some authors propose a solution

while others refute and propose the opposite. In order to provide a full scope of the literature review, both views will be presented in the most objective manner.

In regarding if a solution to climate change should be to put sanctions or no sanctions, some authors (Stoll-Kleemann, O'Riordan, & Jaeger, 2001) state that there should be and explain that one of the main reasons that the Kyoto Protocol didn't work is because there wasn't any sanctions for countries that didn't meet the protocol's goals—it is important to add the Paris Agreement is similar to the Kyoto Protocol in this regard and as we've seen in "The concept and the international context of climate change" only two countries are meeting the goal of 1.5°C increase—. Still, other authors step in to explain that sanctions are not always the "best" way (Thaler & Sunstein, 2008). They say that a cap-and-trade system might work in the meantime so that "if a polluter wants to increase its level of activity, and hence its level of pollution, it isn't entirely blocked. It can purchase a permit via the free market. Assuming that greenhouse gases are to be regulated, American companies have been arguing for a cap-and-trade system for exactly this reason. And if the problem of climate change is to be seriously addressed, the ultimate strategy will be based on incentives, not on command-and-control" (Thaler & Sunstein, 2008, 186). The debate about what will be the "best" way to proceed on the subject is still ongoing.

Economic benefits or environmental benefits?

A similar kind of debate—yet probably less controversial—is seen in the way to express the benefits from pro-environmental behavior. The fact is that it can take a lot of time—years even—for many of the behaviors done today in favor of the environment to actually show their benefits and such thinking could provoke people to decision inertia or discounting the environmental benefits in time and space. So, the solution would be then to just show economic benefits, right? Or a combination of both economic and environmental benefits? (Brik & van der Linden, 2018). However, empirical evidence of the article "Advertising Energy Savings Programs: The Potential Environmental Cost of Emphasizing Monetary Savings" proved that this is not always the case (Schwartz, Bruine de Bruin, & Fischhoff, 2015). As said by the authors: "We found that emphasizing monetary motives reduces reported willingness to engage in activities that inherently have both intrinsic and extrinsic motivation" (Schwartz, Bruine de Bruin, & Fischhoff, 2015, 4). That is, that in the example they had of energy saving programs, monetary benefits are obvious and so, by emphasizing both monetary and environmental benefits, the respondents felt like they were not as "morally green" as they wanted to be or feel. Since monetary savings were obvious in that example, by just emphasizing only the environmental benefits, people were more willing to enroll than in the combination of both, which is also surprising since neoclassical economics—which would assume that more benefits should increase willingness to enroll—is actually not the case in this experiment (Schwartz, Bruine de Bruin, & Fischhoff, 2015).

MEXICO'S SITUATION ON CLIMATE CHANGE

Mexico's situation on climate change is far from ideal at the current moment. As seen in Climate Action Tracker (2019), Mexico's analysis shows it is at an insufficient level in

regard to the Paris Agreement that seeks countries to be at a 1.5°C and at the most of 2°C (Falkner, 2016) —which, anyway, would still provoke serious damage to the environment and our health (IPCC, 2018). Mexico’s level as of the moment is at <3°, which means it will not meet its’ Paris Agreement goals unless it implements “additional policies, and reverse direction on coal to do so” (Climate Action Tracker, 2019, n.p.).

Since 1990, Mexico’s emissions have been increasing, shifting the percentage of such from the agricultural emissions —which declined to 18% in 2015— to energy-related emissions —which increased by almost 40%— (Climate Action Tracker, 2019). The positive remark of this was that in 2012, “Mexico adopted its the General Climate Change Law (LGCC in Spanish), one of the world’s first climate laws—and the first in a developing country. Under this law, Mexico aims to reduce its emissions by 50% from 2000 levels by 2050” (Climate Action Tracker, 2019, n.p.). This seemed to be a great step forward, yet “although Mexico has undertaken considerable policy planning and institution building regarding climate change over recent years, the recent decisions by Mexico’s new administration reverses progress towards implementation of climate change policies” (Climate Action Tracker, 2019, n.p.). By this, it means the favoring of fossil fuel generation—such as gas, coal, diesel and oil-fueled power plants— instead of renewable energies. This is highly against the Paris Agreement’s goals since the agreement states no new coal plants which “now puts Mexico on a path that is even more inconsistent with the steps needed to achieve the Paris Agreement’s 1.5°C limit” (Climate Action Tracker, 2019, n.p.). That is to say, much has to change if our country is serious about creating environmentally effective policies and pro-environmental behaviors alike.

CONCLUSIONS

The behavioral and psychological barriers that we face as humans in the topic of climate change prevention and mitigation actions is no easy task to overcome. However, literature about the subject has provided us with a better understating of the problem and with several tools in our hands to create solutions both in the private and public spheres of our society. National environmental policies and international cooperation is of course needed in order to attain a more sustainable world, but the effects of the mechanisms and processes of the individual mind should not be underestimated. Theories such as the Theory of Planned Behavior and System 1 and System 2 have to be considered when considering action on public and private policies against climate change. Nonetheless, the other theories: NEP, Moral Foundations Theory and Value Belief Norm —as well as any other theories that may exist on the subject— should certainly be taken into consideration.

The solutions stated in the text are probably best some of these are used in a simultaneous fashion. However, such solutions—as well as other findings in the field of behavioral economics— cannot be interpreted as the only way to fix the problem of human inaction regarding the environment. Interdisciplinary knowledge and actions are needed in order to face the challenges that climate change has already —and will certainly— pose to our world in the present and future years to come. It is also important to mention that not all solutions and recommendations apply to all contexts and cultures, so pilot tests on the

specific population in mind are needed before implementing such environmental policies, since intrinsic characteristics of a certain population —even with the same message— could lead to different results.

Finally, if we are to move into a more sustainable world, the reader must also take away that he or she can benefit from the knowledge researchers and experts on the field have provided us in order to be more aware of our own psychological barriers that drive our daily life so that not only others but us too can close the gap between wanting and changing..

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