

## Biological Urges against the Reduction of Greenhouse Gasses

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This article seeks to explain the apparent inaction of law makers in relation to the reduction of greenhouse gas emissions by reference to human biological drives. Probably the most basic biological urges are the urge to survive, the urge to reproduce and the urge to search for nutrients, where money and resources can be considered an equivalent for nutrients. We demonstrate how biological drives influence our actions through subliminal thinking. Evidently, the problem of insufficient climate laws may not be easily overcome, as subconscious, biological processes are difficult to alter. The urge to favour group members and the urge to free ride stand in our way. We suggest expanding the in-group, ensuring reciprocity, providing emotionally engaging information, utilizing ego-based incentives and punishing free riders. Probably, this will make implemented solutions more efficient.

Keywords: global warming; biological urges; out-group; behavioral psychology; treaty; climate change

### Introduction

‘Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level’ (IPCC, Climate Change 2007). Until now, measures against the reduction of greenhouse gasses remain mainly unsuccessful. Rachlinski (2000, 315) tries to explain these disasters by pointing out that most Americans believe other countries “must also commit to doing their part”. And Stavins (1997) points out that “free riding problems plague unilateral and multilateral ‘solutions’. In addition, Taylor (2001) argues that current developments in climate change law fail to address patterns of human activity, which are the root causes of climate change and are also insufficient in recognising climate change as a significant, environmental threat, described by scientists as the “super tanker of environmental issues in the 20th century” (Badrinarayana, 2010, p. 272). While the UNFCCC’s objective is to “stabilize greenhouse gas concentrations in atmosphere at a level to prevent dangerous anthropogenic interference with the climate system,”

Taylor shows that this is limited by the allowance for the reduction to be “within a timeframe that allows ecosystems to adapt and enables economic development to proceed” (2001, p. 250). Similarly, overly generous timetables and deficient emission reduction targets of

the Kyoto Protocol, demonstrate the prioritization of economic interests. Here, Taylor points out the discrepancy between international scientific recommendations and actual agreement of nation states. For example, the 1990 Intergovernmental Panel on Climate Change (IPCC) Report requires that, to stabilize greenhouse gases, countries must immediately reduce activities from human actions by 60%.

However, the Kyoto commitments only aim to reduce overall emissions of industrialized country parties by 5.2% between 2008 and 2012. This is nearly 12 times less demanding than initial report, and only to be attained 20 years later than recommended. These “miniscule, ecologically inappropriate and pathetic” targets are a direct reflection of economic preferences, which override desires to create any meaningful changes (250-259). United Nations Secretary General Ban Ki Moon stated (Brownsell, 2009) World leaders will come together for the Copenhagen climate change conference in December and every citizen of the world has a stake in the outcome. It is time to seal a deal. We need a global movement that mobilizes real change. Hopenhagen is about more than hope. It is about global action for a global climate treaty and a better future for mankind. The talks turned out to be a hopeless failure.

The climate conference in Durban in 2011 has brought us nothing more than a deal that there will be more talks. Although even the International Energy Agency, a conservative body relied on by the fossil fuel industry, has warned that the world is “headed for irreversible climate change in five years,”<sup>1</sup> reflecting

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the sense of urgency felt by scientists, who argue there is no room for further delay in embarking on the transition to a lower-carbon economy (Climate Commission, 2011), it is highly unlikely that current laws will result in greenhouse gas emission reductions of the magnitude necessary or at a rate rapid enough, to prevent significant changes to global climate systems (Taylor, 2001).

In spite of this sense of urgency, economic preferences seem to be time and again the main cause of the failure of emission reduction. From a biological point of view this is not surprising. Probably the most basic biological urges are the urge to survive, the urge to reproduce and the urge to search for nutrients, where money and resources can be considered an equivalent for nutrients. These three properties distinguish the DNA or gene from other molecules and thus distinguishes living creatures from inorganic structures. Without survival, additional molecules and reproduction is the spreading of genes impossible (Dawkins 2006; Hamilton, 1964). It is the survival and reproduction of genes that dictates the behaviour of organisms (Salmon & Crawford, 2009).

The result of this urge is an exponential growth until resources diminish. After a period of time equilibrium evolves in which the population is in balance with the amount of food. Because the urge to earn money is linked to the urge to find nutrients, economic growth is an urge that can be reduced to the very properties of our genes. On the other hand is reduction of greenhouse gasses necessary in order to prevent disasters that could diminish our offspring. Why then do we choose for economic growth in stead off stopping climate change? And what should be done to make a shift to a sustainable society? This article will try to explain these questions from the perspective of biological drives of humans. We will search for answers from a biological perspective as it is was explained in *A Biological Theory of Law* (Gommer, 2011). First we will consider what the main problem seems to be, then we will discuss in short the biological theory and then we will answer the question from a biological perspective. Finally, we will make some suggestions to improve the measures taken against global warming.

### **Economic and Domestic Priorities**

It is not that people do not believe that the climate is changing. For example, 89% of the British public believes that human activities are playing a causal role in climate change, 54 % of the Australians believed they already were experiencing the effects, 71 % of the British are very concerned and the majority of the Australians and British feel their actions could make a

difference (Reser et al., 2011). Also 47% of the Americans consider global warming an important issue (Harder, 2008). The message seems to be clear enough, but the problem is how to take action? Taylor (2001, p. 250) argues that there is a consistent focus on economic growth and efficiency, which is problematic as it limits the Kyoto Protocol. The fragmented, uncertain and insufficient climate law thus allows economically driven, (greenhouse gas emitting) development to continue (Michael, 2010, p. 2). Evidently, both nations and individuals aren't interested in creating strong climate change legislation, as most countries have economic and domestic priorities in mind when negotiating international politics. Thus structural economic changes (Taylor, 2001, 263), which may be disadvantageous economically but are nonetheless necessary, seem unlikely to be achieved in the foreseeable future. Much support has been expressed for Taylor's argument, especially concerning the disappointing outcome of climate change law and the overall inadequacy of the Kyoto Protocol. Despite pledging alliance to binding, international law, few governments have made fundamental change to their economy of the type needed to enact change, and as a result, national and global greenhouse gas emissions continue to increase (Scott, 2007, p. 40). Again, these observations cement Taylor's argument that countries are primarily interested in their own economic development over interests of world citizens in general (Badrinarayana, 2010, p. 262).

As Rachlinski (2000, p. 315) argues, countries point their fingers to the commitment of others, like most Americans believe other countries "must also commit to doing their part". This interest in the own economic development is in line with two biological urges, the urge to favour group members and the urge to free ride (cheat). Individuals benefit from the reproductive success of kin (Hamilton, 1964). The probability that individuals share the same type of genes declines as the kin relationship becomes more distant. Non-kin probably have few genes that are exactly of the same type. Consequently, people will invest less in non-kin than in close kin, and even less in other species (Gommer, 2011, pp. 146-147; Park, Schaller & Van Vugt 2008). Sharing food, at least with family, is a strong urge (De Waal, 2009, p. 42), but not with strangers. People generally also will be less disturbed if non-kin are harmed than if close kin are (Gommer, 2011, p. 146). However, non-related group members also are concerned for each other. Mutually involved group members will harm each other less. In primitive cultures, hunters attack hunters from other groups, but seldom from their own group (Gat, 2006, pp. 10-11). Probably, our ancestors evolved into *Homo Sapiens* by living in groups. The group helped them to

survive disasters and attacks. Security is probably one of the main drivers of social life. This is why ground-dwelling monkeys, such as baboons, travel in large groups. According to De Waal (2009, p. 21), we descend from a long line of group-living primates with a high degree of interdependence. Macaques have been found to support unrelated others that previously had supported them by intervening in conflicts (Flack & De Waal, 2000). Thus, retaliation and reward can be considered necessary in systems based on cooperation and reciprocity (De Waal, 1996, pp. 157-159). Finding security is a benefit of belonging to a group, as is finding and sharing food. Thus, living in groups is an important characteristic of humans (Trivers, 1985). Group members do not have to be genetically related (Serpell, 1986). Sympathy for persons who are not offspring is an even more distinct and distinctly human trait (Wilson, 1992).

Empathy probably will help us to care for both genetically related and genetically non-related group members (and even animals) (De Waal, 2008). This human trait does make it possible to cooperate in groups, even if the members are not related, and benefit from it. Helping in-group mates will stabilize and amplify the group. This will improve chances of survival and the reproduction of its members (Ruse, 1995). We are stronger with the help of our neighbors, and when we cooperate, we can become specialists. In this way, we can form a society that can defend itself even better and find more food, so that its members can improve on their reproductive success. We will treat group members altruistically, as long as they contribute to the group according to group rules and group moral. We have strong inhibitions against killing members of our own community (De Waal, 2006, p. 56; Green & Haidt, 2002). We feel empathic concern towards them, and this will help to stabilize the group (De Waal, 2009, pp. 21-29).

For out-group people, the story is different. They can endanger the community by taking food away, killing children, and using women to their own procreative ends. Non-group members do not contribute to group stability, nor do they contribute to the spreading of our genes. On the contrary, they are a threat to our genes, because their genes probably will spread by diminishing our own (Alexander, 1987, 174). Seen like this, killing out-group people can benefit the spreading of genes of in-group people. Sorel (1970) shows that morals help groups to unite against other groups that easily can turn into enemies. Within the group, sympathy prevails. Outside the group, torture is no problem. It is almost always captives or slaves from other societies who are the victims of human sacrifices. Alien tribes may appear to be distinct species to each other (Collins, 1974). "In-group thinking" is still strong. We know that

globalization makes in-group members out of all out-groupers, but it does not always feel that way. Strangers, people that look or think differently, or that live far away, easily can be regarded as dangerous out-groupers. We will not feel empathic with them and will think in a competitive way. Our own reproduction first, therefore economic growth within our own country feels more important than global environment.

### **Charity Begins at Home**

The second urge, the urge to free ride, also derives from the competition of genes. Individuals in a group have less space, but the benefits of the group clearly are more substantial. Larger groups involve even greater costs to individuals (Boehm, 2004), such as the loss of space to reproduce. Therefore, there have to be more benefits. Individuals will unconsciously strive to gain more space for their spouse within the group. Genes of individuals that take advantage of other individuals within this society are even more successful. If we could let our neighbors work for us, our genes would spread faster than those of our neighbors. Therefore, while working together, we also have to be smarter than our group members. People are equal, so they tell us, but charity begins at home. Genes that program people to cheat will tend to be very successful and spread rapidly within the population, unless other people unmask the cheaters. In a stable society, cheaters – free riders – will be caught and punished. Their cheating ultimately will thwart their efforts to reproduce, and so the genes of cooperative humans who only cheat in a limited and/or very smart way will spread within the population. We need a very sophisticated system of keeping free riders out and keeping the level of cooperation high. We need a very complex brain that can map all social contacts and behavior in our neighbourhood (Dunbar, 2001). This brain is trained to localize people who want to take use of its body. The brain will use labels to identify group members and strategies. For people that make use of my resources without giving me something in return, the brain will categorize them as "cheaters". Intruders or group members who kill group members that cooperate with me are "murderers." This behavior is not conducive to spreading my genes, so we will label it as "bad." It is probable that a species that evolved such a moral system could improve their cooperation and so could spread their genes. This moral system also made it possible that people evolved certain skills and specialized in them. By means of altruistic punishment, people punished cheaters, even when their direct benefit was low. As Fehr and Gächter (2002) discovered, people tend to contribute half of their earnings to the benefit of the group, even though they

would gain more if they kept it for themselves. They want to promote the welfare of the group (Richerson & Boyd, 2001), and they do this out of feelings of debt and gratitude (McCullough, Kilpatrick, Larson, Emmons, 2001).

The costs of giving to group members even are underestimated by the givers (Janicki, 2004). If we project these urges to a global scale we can predict that people will want to favour their group members first and they will try to take a free ride on out-groupers. Thus they will strive for earning as much money (find as much food) as possible and will try to slide the global problems to out-groupers. This is what Taylor observes.

In addition, individual politicians have their own personal, ulterior motives, as they are largely career orientated (Janicki, 2004) and thus cannot afford to make controversial decisions towards a low-carbon economy, as this may jeopardise their popularity and this poor reputation may therefore be damaging to their own chances of reproduction. For that matter, the aspect of reputation works also the other way round. The positive reputation generated from associating with a seemingly important, environmental issue is a motive for many countries (Scott, 2007). The urges to favour in-groupers and to take a free ride could also be the cause of counterarguments. Mike Hulme, for example, argues that the discourse reveals more about the struggle for power between institutions of science, government and civil society than about any physical reality (Scott, 2007). Similarly, pro-fossil fuel companies, for obvious reasons often claim that the 'crisis' is exaggerated (Scott, 2007). This is contrasted by the 4th assessment report of the IPCC, which argues that the warming of the climate system is unequivocal (Pachauri & Reisinger, 2007, 104).

This IPCC report has been extensively scrutinized and conclusively found to be virtually free from error (Climate Commission, 2011). The report shows that this rise in temperature, is most likely due to an increase in greenhouse gas concentrations, and will have disastrous effects on the global environment. These effects include loss of arctic sea ice, disintegration of Greenland, species extinction, desertification and drought, and will also have social and health related effects on humanity, such as exposure to new disease vectors (such as malaria) and human insecurity.

Importantly, the increase in atmospheric concentration of greenhouse gases (CO<sub>2</sub> being the most important) has been explicitly linked to human activity, as the proven cause of increased fossil fuel consumption. Given the confirmed reliability of the report, Taylor's assessment of the severity climate change would appear to be correct. However,

biological theory is needed to find a sound foundation to solve the problem.

### **Subliminal, Associative Thinking**

The capacity to consider consequences of one's own actions on a long term is a relative new feature in evolution. Thanks to their large brain capacity people are able to plan months or even years ahead. However, this does not mean that their biological urges of reproduction and search for food have diminished. The human conscious mind that is necessary for long term planning has a limited capacity. This makes it difficult for the conscious to balance and evaluate several different pieces of information at once (Dijksterhuis & Nordgren, 2006). The consequence is that people, whether they know it or not, will draw upon their unconscious reservoirs of experience, social norms, morals, emotions and urges when making their decisions (Altman, 1986; Kennedy, 1976). Genetic processes are entrenched deeply within these emotions, social norms and morals (Gommer, 2011, pp. 69-71). Thus, short term benefits will have a strong impact on our decisions. Weber (2006, pp. 103-104) contends that it is subliminal 'worry' that drives swift risk management, whereas description based statistics and analytical processes that need conscious reasoning are less effective in generating a visceral, human reaction. Weber explains that there are two different biological pathways to establish concern, or the feeling of being at risk (Peters & Slovic, 2000).

One is through personal exposure to adverse consequences, typically repeated over time, while the other (less effective path), is through consideration of adverse consequences based on statistical summaries, typically provided by domain experts (Weber, 2006, 104). The first type of response, experienced via the "associative system" (Loewenstein, Weber, Hsee & Welch, 2001), is evolutionarily and historically provided humans with affective shortcuts to alert them "to imminent danger and trigger quick evasive action" (Weber, 2006, p. 108). This associative system is intuitive and acts rapidly; representing the risk as a strong, negative emotion (for example; fear, dread or anxiety) (Loewenstein et al., 2001).

Conversely, the second type of response is via the 'analytical response system,' based on formal logic and probability, which is slower and requires conscious awareness and control. Contrasting to the more primitive, associative system, this processing system is stimulated by a method of information acquisition available only to humans, with their ability for abstract representation (Trope & Liberman, 2003). Weber (2006, p. 108) describes this as an 'evolutionary work-in-progress,' as it isn't triggered

automatically, must be learned and practiced. While both of these processes run in parallel to each other, any conflict between the two systems will be triumphed by the associative system, which is not necessarily logical, but is more instinctive.

### **Risk Perception and Climate Change**

Weber thus argues that the time-delayed, abstract, and statistical nature of the risks of global warming reflects the analytical process of risk perception and thus does not evoke strong, visceral reactions in individuals (Weber, 2006, p. 104). Despite the growing consensus among climate scientists worldwide about the seriousness of potential risks posed by global warming (Weber, 2006, p. 108), Weber (2006, p. 103) asserts that the concern shown by citizens and governmental players pales in comparison. The significant discrepancy between the actions of the public and the objective risk assessment provided by scientists may be explained due to the fact that there are few serious and noticeable adverse climate change encounters in many regions of the world and thus many people may not receive sufficient feedback from their personal experience to develop a reaction of alarm about global warming (107-108). In contrast, it is evident that climate scientists are more wary and fearful of the climate change effects, arguably due to their research, which regularly exposes them to noticeable adverse consequences of global warming, and thus provides an experienced-based process of risk-analysis (107).

Weber's theory has been supported by other psychological articles, many of which identify risk-perception as a limitation in public acceptance and prioritization of climate change (Adger et al., 2009), especially as society doesn't believe the risk is great enough to justify action. To supplement Weber's argument, other psychological factors have also been suggested to affect the current insubstantial climate change law. These include the level of trust in the responsible organizations or scientific projections (Stern, 2011) and the values, perceptions and power structures within society (Adger et al., 2009). Thus, while Weber is clearly narrowing her focus on risk-perception, there may have been other psychological factors to consider in her article. On a negative note, Weber fails to take into account those who have witnessed the adverse effects of climate change as she only focuses on those who process the risk via statistical-based information. Low-lying coastal countries that are particularly vulnerable, are already experiencing effects of climate change, such as extreme temperature hikes, drought, increased sea temperature, which may lead to hurricanes and other natural disasters (Secretariat of United Nations

Framework Convention on Climate Change, 2007), which is not accounted for by Weber. Countries that are directly confronted with the dangers of sea level rise as Tuvalu citizens, are very much aware of the problems and try with all their might to reduce the emission of greenhouse gasses. However, they are probably considered out-group people by other world citizens and thus their cry is not heard.

In addition, Weber fails to recognise growing public support for climate change as she contends that concern shown by citizens, towards climate change is generally "more tentative than that of scientists" (Weber, 2006, p. 103). In 2011 in Melbourne for example, by a pro-carbon rally was attended by an estimated 10,000 people, as part of a national climate-change campaign urging the federal government to set a carbon price (AAP, 2011). Pro carbon-tax politicians described this, as a "show of strength from people who wanted real action on climate change". As noted above, most Australians and British are very much aware of the threat and still act insufficiently. Short term biological urges of reproduction, growth, free riding and in-group loyalty seem to frustrate action. It is evident that Weber's contention largely compliments Taylor's argument. The common evaluation of climate change as a "low risk" issue, as described by Weber, has a direct effect on the "pathetic" targets (Taylor, 2001, p. 259) and overall disappointing nature of the current legal instruments, outlined by Taylor. Rather, people are pre-occupied with other issues that stimulate their associative processing system, such as the risk of economic crisis, which generates a strong, automatic reaction caused by biological urges. Threats to economic prosperity and domestic preservation are treated with far more anxiety (compared to long-term threat of climate change), as they are immediate threats and presumably have affected people more directly (in events such as the global financial crises in 2008 and 2011 or even in economic losses and gains in day-to-day life). Thus, prioritization of economics over the more abstract issue of climate change, as demonstrated by Taylor, can be explained via Weber's theory, that demonstrates that rapid and emotional responses are generated by repeated, personal exposure to the adverse consequences of a given issue. This idea in turn is backed up by biological theory that predicts that the properties of our genes will play a dominant role in our decisions. In addition, terrorism seems to present a higher threat in the eyes of the politicians and the population, than climate change. This may be due to experiences like the September 11 plane crashes and other contemporary terrorist attacks that have occurred as of late. This fear is highlighted by the recent, strong anti-terrorist legislation in the USA, such as the Patriot Act 2001, and Terrorism Risk protection Act, as well as quasi-legislative activity of the Security Council on

Terrorism and Weapons of Mass Destruction (Scott, 2007). It would seem that the risk of terrorism is thus processed via the associative system, to generate rapid and strong emotional responses.

Frantz and Mayer try to explain the difference by applying the Latane and Darley's (1970) model of helping behaviour in emergencies. Before we take action we not only must notice the event, interpret the event as an emergency situation and feel a sense of personal responsibility, we also need to know what to do. Therefore "people need to be provided with real options for reducing their carbon footprint" (Frantz & Mayer, 2009). Whereas in the case of climate changes everyone has to act simultaneously in a way they do not exactly know, terrorism is pictured as a threat that is immanent, that can be eliminated within a short period by concrete action of the government. People only need to pay some money to get the protection they need. Comparatively, while there have been recent developments in US law concerning climate change with the establishment of the American Clean Energy and Security Act 2009, this has been criticized as being too weak and allowing for dangerous greenhouse gas emission habits to continue (Nichols, 2009).

Hansen (2009), one of the first scientists to warn about the risks of climate change, also greatly opposes the bill, as it sets 'meagre' targets for emission reductions. This is particularly worrying for the US (highlighted by Taylor) as they are significant emitters of greenhouse gases and haven't pledged a strong commitment to reduction (only 7% reduction, which is a fraction above the minimum) and in addition, they have not ratified the Kyoto protocol (Taylor, 2001, p. 260). According Frantz and Mayer (2009, p. 214), the magnitude of global warming is greater than individuals can handle. On top of that, we do not get extra protection for our money, but instead we must lessen consumption and live in smaller houses.

As Kahneman and Tversky (1996) point out, this message is contrary to human nature. We do not like losing what we have. In accordance, the US and countries alike do not want to lose their economic primacy, especially in light of the emerging developing countries (such as China and India) who may thus surpass them economically if they have no such emission limits places on them (Badrinarayana, 2010, 275). Neither do individuals want to lose their wealth. And this in turn will tempt them to be sceptical about their role in climate change or even will make them deny human actions as the source of global warming. Not only do their actions influence their beliefs by means of cognitive dissonance (Festinger, 1957), they will also perceive scientific information in accordance with their personal values. When the scientific conclusion threatens their values, e.g. more is

better, people will "tend to react dismissively" (Kahan, Braman, Jenkins-Smith, 2010).

### **Behavioural Aspects**

Evidently, many of the behaviours and subsequent laws on climate change, as discussed above, may be a consequence of our gene characteristics. As biological law theory tells us: all organisms act ultimately to further the reproductive capacity of their genes. However, on the face of it, climate change objectively poses a threat to the survival of many people and thus threatens to destroy the ability of their genes to replicate. Yet, this isn't enough to generate widespread unified action. Behavioural economist Ariely (2009) offers a unique insight into this issue. He explains although humans feel that they are in control of their decisions, this may be an illusion. Ariely demonstrates his theory with a simple optical illusion. This optical illusion consists of two tables that appear to be different sizes, but are in fact the same dimensions. The mistake of the human eye can clearly be demonstrated by drawing a line over one table and transferring it to the other (without alteration) proving they are both the same length.

However, even though the visual illusion has been proved, it is impossible to overcome the feeling that one table is longer than the other (Ariely, Huber and Wertenbroch, 2005) in other words, Ariely points out that human intuition is easily deceived, even if the intuitive outcome is illogical. Evolutionary based perceptions will influence our decision strongly. This argument may be applied to the climate change scenario. Here, it seems that our underlying genes do believe they are furthering their reproductive capacity by focusing on economic development over climate change.

While objectively, climate change poses a serious threat to survival (Pachauri & Reisinger, 2007, p.104) (and consequently, to gene replication) humans are limited by their psychological inability to comprehend the true threat of climate change and translate this comprehension into action. Thus, while humans think they are addressing the most dangerous risks to their survival, they are actually ignoring one of the most significant hazards of all. This is unavoidable, as risk-perception is an evolutionary fact. It is evident that according to biological theory of law this apparent paradox will continue. Humans do not act according to pure logic. Thus, when it comes to the objectively serious threat of climate change, the desire to reproduce is inevitably limited by the inability to actually recognise the most significant threat to their survival, while choosing for short term in-group benefits. However, biological theory of law also

explains that as a result of globalization, in-groups may be extended and states may sometimes work together to fight mutual threats such as climate change (Gommer, 2011, p. 22). For this to happen out-group fears have to be overcome. Law can help to expand national in-group to global in-group.

The divide between industrialised and developing countries represents such an in-group/out-group polarization. Taylor demonstrates this divide in the debate on emissions trading, which is strongly supported by industrialised countries (assumedly as it would benefit their market capabilities) and equally rejected by developing countries that don't have the means of engaging in such market mechanisms (Badrinarayana, 2010, p. 266).

Lack of cooperation is also demonstrated in the refusal of industrialised countries to aid more vulnerable, developing countries by agreeing to lower current climate change targets (Harvey, 2011). In line with in-group/out-group theory, these industrialised, richer countries see no superficial commonality with developing countries (due to stark difference in nationality, language and culture), and thus are unlikely to cooperate with them- especially if it doesn't further their own interests. Reciprocity will only occur to the point at which genes are able to satisfy their own needs (Gommer, 2011, p. 37). Thus, industrialised countries see no benefit for their own survival in supporting poorer, developing countries, who present an inherent threat, as out-groupers. If populations are unsustainable they inevitably collapse (See generally Diamond, 2008).

As Gommer and Swales (2012) suggest, Aboriginal people seem to have developed a legal system that allowed them to stay within the nutritional limits of their environment. Refraining from hunting in order to protect the breeding and survival sites of significant species was incorporated into one's legal obligations (Rose, 2003). Risk-spreading through cooperation and reciprocity allowed Aboriginal people to spread their genes over an entire continent and its outlying islands, and then achieve a political stability in which no one group has sought to overrun the other. Biological law theory holds that a globalisation in which states work cooperatively to address challenges and allow all participating parties to prosper in an environment otherwise non-conducive to stability is the highest level of legal organisation available to mankind (Gommer, 2011, p. 22).

An interesting proposition is that classical Aboriginal society, in establishing such stable rules of jurisdiction, conflict resolution and reciprocity had at some time in its 40,000 year history, proceeded through the treaty stage to the global community stage within the boundaries of the continent that formed the Aboriginal cosmos. The delimitation of the agreements

regarding boundaries and jurisdiction were encoded in sacred mythological law. What can be learned from Aboriginal law is that expanding the in-group radically, even incorporating nature itself, seems to be necessary to reach a balanced and sustainable society in a world where resources are scarce. This knowledge could prevent us from cycling through eras of extinction and growth before an equilibrium is reached.

## Two Successful Treaties

The success of the Convention on Long-Range Transboundary Air Pollution (CLRTAP) may further our insight. We state that in that case it was not a matter of cutting back yields, but instead a matter of prosperity. In 1968 it was shown that acid rain that destroyed the woods and lakes in Sweden was mainly caused by pollution in foreign countries (Odén, 1968).

The Scandinavian countries organized a UN Conference on Human Environment in 1972. The conference closed with the "Declaration on the Human Environment" in which Principle 21 played an important role. Sovereign states had the responsibility to prevent damage to the environment of other states. Nonetheless, the declaration turned out to be no more than nice words. In 1979 the CLRTAP stated in article 2 that governments would "strive" for reduction of pollution "as far as possible". The solution however came from technical advances. Reduction of SO<sub>2</sub>-emissions became much cheaper and in 1993 it turned out that even countries that did not sign the Helsinki Protocol had cut pollution with 30% (Sliggers & Kakebeeke, 2004, 28).

To prevent environmental and health damages turned out to be much cheaper than undoing damages. New techniques made it possible to literally clear the air without cutting access to resources. The success of the CLRTAP can be explained by the fact that caring for the environment could go along with economic growth of collaborating parties.

## Possible Solutions

The deficiencies of climate change law are thus highlighted in drawing connection to biological law theory. In line with biological law theory, we will identify some potential solutions, which have two distinct aims. Firstly, to facilitate successful cooperation between countries, especially those that are typically considered culturally and ethnically different and secondly, to create a strong and coherent international body of climate change law that is observed by all countries.

***Expanding the in-group***

The most efficient way to combat danger (i.e. climate change), is by expanding the in-group (Gommer, 2011, 138) and thus ensuring universal cooperation against a common threat. However, this can only occur where people feel that other races or ethnicities are as human as themselves, otherwise they will treat them as out-group members (Gommer, 2011, p.49). As evidenced above, nations who look or think differently can be easily regarded as dangerous out-groupers (Gommer, 2011, p. 139) and will thus not be cooperated with. Thus, an ideal climate change law construction would take steps beyond nationalism and recognise that climate threats and emissions pervade boundaries, cultural and religious differences (Badrinarayana, 2010, p. 289). Even natural sources should in some way be included to the in-group. Tied into this, would be a means by which to ensure reciprocity. This would ensure that industrialised countries gain something by investing in or supporting developing countries and thus do not feel they will be disadvantaged as a result of providing aid. Overall, it is evident that the cooperation of countries cannot be bound by national self-interest and must instead stem from a common desire to eradicate a shared threat.

***Ensure reciprocity***

While, in theory, a coherent and cooperative global community would be the best solution to encourage enhanced reproductive capabilities (for example, through unified actions against climate change), the overwhelming power of genes, essentially disenable any purely altruistic behaviour in humans that is not beneficial to their own reproduction and survival. Subsequently, genes will inevitably take advantage of co-operators and may attempt to catch a free ride by pursuing their own interests without contributing to the whole (Gommer, 2011, p. 50). This will only be overcome if reciprocity is ensured, and people feel they are gaining a benefit by cooperating with others. Furthermore, reciprocity should be reached by the feeling of growth, not by the feeling of reduction. Industrialized countries could for example be encouraged to trade solar panels or windmills for oil, coal or other commodities of developing countries. More and cheap sustainable energy feels better than less and expensive fossile fuels, although the effect may be the same.

***Emotionally engaging information***

In order to directly address the risk-perception issue, Weber suggests that policy-makers and climate change

reformers should find a way to evoke stronger visceral reactions towards the risk of global warming. This may be done by making the future consequences of global warming more vivid (however realistic!) (Weber, 2006, p. 114) and thus encouraging the risk of global warming to be processed via the associative system to provoke rapid action and concern. Increasing damage and disasters could be shown to decrease actual economic growth.

***Utilize ego-based incentives***

Ariely (2010) argues that the issue of global warming is one, which people don't care about and arguably, never will. He contends that its consequences are mainly far away in future and uncertain, for many people living in wealthy countries, it would not largely affect them and any action taken seems to be insignificant when compared to the huge, overwhelming climate crisis. Thus, a solution may lie in somehow taking advantage of people's emotions according to what we know about genes. Ariely argues that generating awareness and passion about global warming is via creation of ego-fulfilling rewards. To illustrate the potential effectiveness of this strategy, he uses the example of people who drive a more environmentally friendly car. Ariely argues these people aren't necessarily interested in climate change (as they usually don't take extra action in other facets of their life to reduce emissions) but they drive this particular car as an ego boost.

In other words, driving an environmentally friendly car makes them feel that they are a good person and also provides a means by which other people can see them as a good person. This argument ties in with the argument that people usually cooperate within a given group gain the approval of fellow group members and thus be more likely to find a mate and reproduce (Gommer, 2011, 37). Thus, a convincing solution lies in constructing a means of reward substitution, encouraging people to care about climate change via an ego-boosting incentive. A helpful tool may be through creating a public mechanism by which people can signal their energy saving activities to others.

Ariely (2010) provides an example of this in Israel, whereby people report to a public website on their water saving activities and their current water usage levels. The website provides simple visuals to create an overall measure of the water saving of every household which people can show off and be proud of (Ariely, 2010). This provides a sound incentive, even for those who don't care about water saving, as it allows them to create a positive image of themselves that is available to the general public- which inherently benefits their genes desire to reproduce.



### *Punish free riders*

Individuals, groups, states, politicians, they all have the urge to take a free ride. This urge must be recognized and measures have to be taken in order to diminish the benefits of free riding. Therefore, sanctions are necessary. Individuals that do not follow environmental law must be punished, this counts for states as well. States that do not reduce greenhouse gasses must at least lose their good reputation.

### **Conclusion**

Evidently, the problem of insufficient climate laws may not be easily overcome, as subconscious, biological processes are difficult to alter. The urge to favour group members and the urge to free ride stand in our way. Even with this in mind, we could think of some aspects solutions, which may enable people to comprehend the true, objective threat of global warming. New solutions that are to be implemented must take into account expanding the in-group, ensuring reciprocity, providing emotionally engaging information, utilizing ego-based incentives and punishing free riders. In any case, solutions should always take biological mechanisms seriously if they want to be successful.

### **Note**

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