ABOUT-FACE

Psychology in the Face of Global Warming

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INTRODUCTION: PSYCHOLOGY IN A WARMING WORLD

How do we find meaning in our actions when the world seems to be coming to an end?

Jonathan Franzen

This thesis has been written in strange times. I wanted to explore how we are to comprehend something that is increasingly creeping into our consciousness, yet remains impalpable as ever. A *hyperobject* "massively distributed in time and space relative to humans" (Morton 2013, p.1), and yet seeming to be interwoven into our everyday lives of living, eating, being and doing together in an interconnected global world. Global warming seems to be here and there, happening now and then; burning skies in Australia (Quilty, 2020) and plagues of locust swarms raging across the continent of Africa (Dahir, 2020). And while the apocalypse is taking place elsewhere, I find myself watching the local news, where a farmer somewhere in Denmark stands in the middle of his field in a muddy pool of rain, bemoaning how he stands to experience a loss in revenue due to the warmest January ever recorded followed by a record high rainfall in February. But not only am I experiencing global warming, I am also acting it and concurringly urged to react to it, if we are not to move past *the tipping point*, where irreversible changes are made to the climate (Malm, 2018). However, when we are to make the connections between hell-scapes there and uneventful gloomy weather here, present local actions with future and remote effects, all we can cling to is a representation of the phenomenon resembling a hockey stick[1] and what fundamentally seems to be a leap of faith in science. But then something happened. At some point in time, possibly at a local food market in Wuhan, China, a microscopic virus makes the jump from animals to humans and brings global society to its knees (Steen-Nielsen, 2020). What seemed like an unyielding global network of self-perpetuating circulations of people, resources, and technologies was suddenly brought to a halt by something which barely classifies as a living being. And what before the Covid-19 pandemic were abstract attempts on my part to conceive how we are woven into this network and entangled in an ecology with *more-than-human* entities (Chimirri & Schraube, 2019),

[1] The hockey stick graph is a nick name for the commonly used graph to show the global mean temperature of the past 2000 years, which shows a jump in the temperature around 1900.

suddenly became very real. Global warming and the coronavirus are obviously different beasts posing different threats, evidently evoking different kinds of human responses. However, they both beg the question of: Do we have the psychological concepts to grasp how our lives are interwoven into a web of life, which exceeds our immediate experience and actions? And, moreover, can psychological perspectives help us navigate and act on a phenomenon that is temporal and spatially stretched out in relation to our own situatedness? These are the fundamental questions that have driven this thesis.

Psychology in the Anthropocene

In 2000 Paul Crutzen and Eugene Stormer brought forward evidence to suggest that we had entered a new geological time. As a result of how human activity has fundamentally altered the conditions for life on earth, "mankind" had become a "major geological force", and we had moved from the Holocene and entered into the Anthropocene (Moore, 2013, p. 3). There is some debate as to when we initiated this new era, albeit with some general consensus around the emergence of the Industrial Revolution – when coal on the small island of Labuan was discovered by the British Empire and "hauled into a circuit that expanded by setting it on fire" (Malm, 2018, p. 20). Others argue that we need to look further back in time and consider colonialisation as marking the beginning of an ever-expanding appropriation and exploitation of *cheap nature* (Patel & Moore, 2018), while others point to the "dropping of Little Boy and Fat Man" on Hiroshima and Nagasaki in August 1945 (Morton, 2013, p. 10). While the Anthropocene is originally formulated as a geological concept, the inauguration of the age of mankind has caused a mobilisation within social science and humanities, where academics have analysed the historical changes that have brought forward this geological time as well as the entailing ecological crises. This is reflected in Bruno Latour's rather pompous declaration that "You are interesting to me only if you situate yourselves during the end time" (Latour in Chimirri & Schraube, 2019, p. 19). The very concept of the Anthropocene is disputed, with some considering it at best an *empty signifier* and at worst a blindfold, distorting how the Anthropocene and its entailing consequences are not a result of *all of humankind*, but rather the acts of a few. While Langdon Winner sarcastically proposes "langdonpocone" as he considers himself a more qualified contender than the "billions of people who have little if any claim to this grandiose geologic title" (Winner, 2017, p. 283) more sincere alternatives such as the Capitalocene are catching on. This emphasises how the ecological crisis is directly caused

by capitalism as a specific historical "way of organizing nature" in the name of the "endless accumulation of capital" (Moore, 2013, p. 5-6).

Underlining the various academic attempts to grasp the Anthropocene, including the challenges of global warming, is the maxim that, for humanmade problems, humanmade solutions must also exist. However, due to the complex nature of these problems, such as how global warming appears intrinsically linked to how human activity has arranged itself into a global network, these problems are commonly referred to as *wicked problems* (Clayton & Manning, 2018). Nevertheless, attempts to resolve these issues seem to be emerging at steady pace. This is also the case within the field of psychology, where the topic of global warming, while still a minor subject of inquiry, appears to be gaining traction[2]. To date, the majority of research on the topic is being conducted within the field of environmental psychology, with strands of psychoanalytical (Dodds, 2011) and critical perspectives residing at the periphery (Adams 2016, Räthzel & Uzzel, 2019, Chimirri & Schraube, 2019). The prevailing view of psychology's role in relation to climate change[3] reflects the dominating understanding of psychology as a science of human behaviour. As such, existing research approaches are predominately invested in describing, explaining, and predicting the human behaviour that is causing global warming, with the intention of modifying and adjusting such behavioural patterns so that they become pro-environmental (Clayton & Manning, 2018). Overall, the causes of our unsustainable behaviour are framed as either psychological 'factors' or 'barriers', which are respectively construed as *drivers* of our (destructive) behaviour and as *barriers* preventing us from behaving according to our environmental values. Much research output is published in *The Journal of Environmental Psychology*, where the primary contributions are empirical studies of isolated drivers (values, norms, identity, gender, etc.) and barriers (biases, dissonance, risk-perception, psychological distance, etc.) or inquires into specific emission-heavy behaviour domains such as modes of consumption and transportation. These research findings are to be practically applied in interventions with the purpose of inducing pro-environmental behaviour. Here, solutions range from modifying the conditions for people's decision-making (Weber, 2005), to promoting spillover (Nash et al., 2019), exposure to nature

[2] As of May 2020, 3141 of the 3822 search results (dissertations excluded) in APA PsychInfo database on "Climate change OR global warming" were published from 2010-2020 with an annual incremental increase.
[3] While I personally think that global warming more strongly conveys what we are dealing with (with the rise of temperature significant negative effects will occur to the planetary climate system), climate change is a common term within psychological research and, as such, I will use these two terms somewhat interchangeably throughout.

(Zelenski et al., 2015), story-based communication (Morris, 2018), and the promotion of sustainable wellbeing (Madsen & Nygaard, 2017).

While the relationship between psychology and global warming is still in its infancy, the mainstream understanding of psychology's role in relation to global warming seems to slowly clarify itself as *the* psychological approach. Environmental psychologists Susan Clayton and Christie Manning state how psychology is a "value-laden science" and by means of interventions they hope to "promote human well-being in the face of environmental change" (Clayton & Manning, 2018, p. 5). But are these values worth promoting? In the face of global warming and the adjacent wicked problems, a time of reckoning appears to have arisen within academia, with academics engaging in self-scrutiny of the knowledge production of which they are a part (Chimiri & Schraube, 2019). If what we are currently facing are wicked problems, interconnected into the very fabric of social life, then there is no reason to think that psychology should somehow reside outside this entanglement, but rather be enmeshed in the problems it attempts to solve. This raises the question of whether psychological perspectives founded on established epistemic notions of psychology as a particular kind of science are adequate perspectives to unravel the phenomenon of global warming.

The Dilemma of Immediate Need for Action

The doomsday clock is ticking. With climate scientists in unison screaming *climate emergency* and desperately calling for action (Ripple et al 2019), do we have the time to critique current approaches or even develop new ones? If the problems we are facing are 'not' solely about stopping global warming, but also about changing the way we think of ourselves – human and our social activities, in relation to world that we are a part of and dependent on – then perhaps the answer is yes. Jason W. Moore and Raj Patel argue that we have become wired to construing Society and Nature as two separate ontological domains, as denoted by the capital letters. Some things reside within Society (humans and our social and cultural life) while others are part of Nature. Moore and Patel consider such concepts to be "real abstraction", both containing ontological notions "*what is,"* as well as epistemological ones; "*how do we know what is?*". Abstractions not only help us to describe the world, but in the process make it. As such, *real* abstraction is not be considered innocent, "but reflects the interest of the powerful and license them to organize the world" (Moore & Patel, 2018, p. 47). This perspective on knowledge seems to resonate with views of psychology as a science which does not passively represents

its object of study, but through the scientific inquiry effects what people think of themselves and their relationship with others – psychology is in "the business of making up people" as phrased by Ian Hacking (Hacking 1996). Though just as Moore and Patel refer to *real* abstractions, global warming entails *real* people facing *real* problems. However, one could reasonably assume that psychological perspectives could influence not only how we understand the *human causes* of global warming, but seemingly what we consider within the realm of possibility to do – should we consume less or differently, revolt, join a sustainable cooperative, or become tree-huggers? In the age of Chthulucene, of "elsewhere and elsewhen that was, still is, and might yet be", Donna Haraway stresses how "it matters what ideas we use to think other ideas". That "knowledge that knows knowledge" matters because it cultivates our "response-ability" in the face of crisis (Haraway, 2016, p. 32 & 34-35). If we accept this relation between our knowledge of global warming and our ability to address the challenges it poses, then we can raise the question of:

Which implications do different psychological schools entail for our possibilities to act on global warming?

In the following I will attempt to approach this question from two angles:

- *How is global warming approached within the dominant school of psychology and what are the implications of it?*

- *How can global warming be approached from a critical psychological perspective and what might an approach to global warming from the standpoint of the subject look like?*

Chapter Guide

This thesis comprises four chapters. **Chapter 1** is an attempt to see how we might approach global warming from a psychological standpoint informed by critical psychological perspectives. **Chapter 2** is an introduction to environmental psychology as the field of psychology predominantly engaged in global warming. Here, I will outline how the phenomenon is approached and the scientific understandings underlying mainstream psychological perspectives to it. **Chapter 3** is an investigation of environmental psychologist Robert Gifford's 'Dragons of Inaction'. The investigation consists of a critique of the

theoretically foundation and of an empirical study in psychological barriers to food choice intentions, which will ultimately be examined as an overall process of developing a psychological understanding of human behaviour in relation to global warming. **Chapter 4** is a perspectival discussion of a social practice approach as a way to overcome the shortcomings of the dominant psychological approach to global warming.

CHAPTER 1: THINKING GLOBAL WARMING WITH CRITICAL PSYCHOLOGY

This chapter is an attempt to *think* global warming with critical psychology. First and foremost this has the purpose of exploring whether critical psychology as a psychology from *the standpoint of the subject* founded on a notion of humans as the shapers of their conditions of life holds any valuable perspectives to understand how global warming becomes an aspect of everyday life. As the choice of critical psychology is not an arbitrary one, but rather indicative of what I think might be a valuable psychological perspective on global warming, this chapter also serves the purpose of clarifying fundamental understandings, which will inform my approach throughout. This chapter begins with a brief introduction to critical psychology, from which I will explore how concepts within critical psychology might serve as the foundation for a critical psychological standpoint from where to engage in the phenomenon of global warming.

What is Critical Psychology?

Critical psychology is an attempt at a "renewal of academic psychology" initially developed by the late Klaus Holzkamp. Holzkamp considered psychology in its current form problematic. At the time of the conception of critical psychology, he considered mainstream psychology to have become a "control science", impeded by a *representation problem* which undermined the very scientific legitimacy of its "socio-political function" (Osterkamp & Schraube, 2013, p. 1). What Holzkamp saw was an *epistemological problem* within psychology and its "arbitrary" relationship between experimental findings and theoretical concepts based on these findings. Holzkamp pointed out that what in the experimental setting was considered *pure* empirical findings, were in fact built upon prescientific concepts which, when conveyed as empirical findings, led to an uncritical and ultimately circular confirmation of the prescientific concepts (ibid). Holzkamp's critique is a rejection of the empiricist notion that the world is given to us 'as it is', arguing that the world is always *represented* through the concepts which we use to make sense of it, hence the representational problem. As such, Holzkamp insisted that the

"critical analysis of its scientific concepts should be an essential part of any systematic psychological research" (p. 2). Here the connection to psychology's socio-political function becomes visible, as this insistence on self-critique is not merely to avoid "a stagnation of science", but also to critically reflect on the applications of psychological research and its representations of the world as claims to "knowledge and truth" (p. 1-2). Holzkamp intended to integrate this self-critique into a renewed psychology, aiming to comprehend "the same reality traditional psychology refers to in a more comprehensive, less distorted, and 'more adequate' way" (p. 2). As such critical psychology took its departure in a reconceptualisation of fundamental theoretical concepts within psychology, on the basis of a functional-historical analysis of humans' *societal nature* as "species-defining," in order to develop *a psychology from the standpoint of the subjective*.

Human societal nature refers to human ability "to create the conditions of one's own life (…) within processes of socio-historical dimensions and thus become their bearers and transformers" (p. 3–4). Therefore the psychic processes such as perception, emotion, thinking and motivation must be understood as being sociohistorically developed, which enables the individual to participate in this shaping and reshaping of the societal conditions, and in the process denoting the psychic functions as internally related to the world and not as intrinsically motivated processes (e.g. driven by a certain type of personality). As such our societal nature can be seen as being double-sided: we are concurrently both the *bearers* and *transformers*. Our emotions might help us recognise what is important to us, but what is important must be seen within the sociohistorical context of what is deemed valid to pursue; emotions might lead us to what is important for sustaining our own conditions as well as the conditions of society. These pursuits might be conjoined, in conflict or constrained, but the important point here is to note that the notion of this double-sided nature seeks to transcend the idea of our actions as being determined by either internal or external determinants, "intrinsic forces" or society (ibid). Humans are able to reproduce their current conditions, yet also have the ability to change them, and there may be good reason to do either. *Reasons* here become the focal point for understanding why Holzkamp insisted that psychology must be a science from the standpoint of the subjective. In order to comprehend how humans participate in the development of their own and society's conditions, as well as the dynamics within this internal relationship, psychology must conduct its inquiry from the level of "subjective reasons for actions" (p. 6). Our reasons for action are by definition given to us in the first person, hence making them unattainable from an external (third person) perspective. Thus, when psychology as a science seeks the intelligibility of the individual's actions it must not be explained in any internal or

external determinations, but understood in its *groundedness*, i.e., how reasons for actions "are grounded in the particular individual's concrete life situation" (p. 5). In the following I will elaborate further on these perspectives in relation to global warming.

Critical Psychology and Global Warming

To the best of my knowledge, the only instance where Holzkamp refers to aspects pertaining to global warming is in his initial draft of 'The Conduct of Everyday Life'. Here, Holzkamp, in relation to how causal events do not condition behaviour, "but enter as premises into subjective coherences of action", concludingly questions his own reasoning, wondering whether conditions outside the subject's possibility to act might exist:

> Here, I am not so much thinking of facts of an ecological nature, the evolution of new pathogenic micro-organisms, or the consequences of technical interventions in nature (such as the "ozone hole") that have obviously largely eluded human control and subjective possibilities to act and are, according to our definition, at best at the margin of what could still be classed as "meaning for us", but have increasingly taken on the character of "blind conditions" beyond our influence. On the one hand, it is hard here to decide in the individual case whether this inaccessibility is effectively definitive, or whether the conditions are merely temporarily beyond our control and can regain, through comprehensive joint efforts, the character of "meanings", thus opening up human possibilities to act (p. 302).

While Holzkamp, at the time of writing, questions whether the "blind conditions" of the ecological nature and expanding ozone holes can be considered as "having meaning for us", the present-day awareness could be read as indicative of an ongoing attempt to gain control over such conditions, allowing for "human possibilities to act". Although Holzkamp did not provide perspectives on how such phenomena transform into 'meanings', his conception of how we can become "totally subjected" to certain "'dead' conditions" – how they put us in epistemologically "ambiguous positions", where "on the one hand, they belong to oneself, on the other, since they encounter us as something else, if not 'totally other', they also have some kind of 'world character' for us" (p. 303)[4] – almost mirrors the odd disposition global warming seems to place us in. And when Holzkamp further juxtaposes our experience of such conditions as something "beyond the possibilities of influencing and controlling in our conduct of everyday life," with its concurrent relation to a "manifold of mediating relations", we can almost conjure up a preliminary critical psychology perspective on global warming as a

[4] Holzkamp refers to physical pain as an instance of 'dead' conditions.

psychological phenomenon (ibid); a phenomenon which in our perception of it simultaneously appears beyond our control and intrinsically linked to our societal participation. The question is thus how we can penetrate "the inaccessible strangeness of such sensations" and if existing concepts within critical psychology already hold some potentialities which would allow us to perceive the phenomenon as part of our possibilities to act. At this point, I will examine two aspects of critical psychology which may serve as a potential starting point: *The (inter)relationship between the individual and society* and *critical psychology as problem-oriented psychology*.

THE (INTER)RELATIONSHIP BETWEEN THE INDIVIDUAL AND SOCIETY

The notion of a psychology from the standpoint of the subject can fundamentally be considered as an attempt to overcome dualistic understandings of the relationship between the individual and society within psychology. The starting point of this understanding builds on the theory of Marx and the fundamental notion that "human beings are distinguished from all other species as they produce the means and conditions of their own lives, i.e. they do not simply live under conditions, but produce the conditions under which they live" (p.19). Here, critical psychology's aim is to "conceptualize this relationship at the level of the individual" and develop concepts which can grasp this "two-sided reality" from the standpoint of the subject (p. 19-20). What at the general level can quite easily be recognised – the society at large is made up of people and it is these people who continuously make this society function – can be difficult to grasp from the standpoint of the individual: How am I, as a singular person, not only affected by the society I am a part of, but also taking part in shaping this society? To Holzkamp, psychology in general has failed to grasp the two-sidedness of this relation and merely considered society, or conditions in general, as something external, which affects the individual in more or less deterministic ways. By missing humans' ability to produce their conditions, psychological theories struggle to explain how, through the history of evolution, humans "could have survived for even three minutes" (ibid), considering our conditions have not always been paved roads and heated homes, but are more accurately characterised by cold, darkness, and the struggle for food and water. According to Holzkamp, in order to avoid such shortcomings and develop a psychological theory which can fully grasp this relationship, we should consider the relationship as an "interrelationship". Specifically, we need to:

> Analyse human beings as producers of the life conditions to which they are simultaneously subject to and to conceptualize the mediation between the vital necessities of sustaining the societal system as a whole and these necessities on the subjective level of the discrete individuals. This is based on the idea that human beings not only live under conditions, but also need to control the conditions of their lives (p. 20).

The fundamental concept within critical psychology to concretise this interrelation is the concept of *agency*. This is not understood as an individual property, but as the "human capacity to gain, in cooperation with others, control over each individual's own life conditions" (ibid). However, as much as the societal nature of humanity is defined by the participations in the collective sustainment of the condition of life, it is also characterised by restraints to participation, conflicts (of interest), and contradictions. The concept developed to comprehend this side of the individual/society relation is that of *restrictive agency*:

> Although in principle there is always the possibility to develop the capacity to act in trying to extend one's own influence over the conditions of one's life, there are many situations where it may seem more reasonable to content oneself with acting within given limits, i.e. to come to some arrangement with those in power to participate in, or at least to neutralize, its latent threats and so preserve some freedom of action in defined areas. This second option for accepting existing limits in complicity or arrangement (or however you wish to call it) with prevailing power relations in order to achieve a certain sphere of influence is what we call the "restrictive" alternative of agency (p. 23).

Restrictive agency is a way to understand how engagement in short-sighted attempts to sustain one's current influence over the conditions limits the long-term interest of expanding one's possibilities to act. Furthermore, by restricting yourself you are equally restricting others hereby reinforcing "the conditions of one's own dependency". Hence, by accepting "the oppressive conditions" you inevitably pass "suppression on to others who are even more dependent", and as such the contradictory nature of restrictive agency is that "by living at the cost of others I am restricting and isolating myself" (p. 24).

If we attempt to comprehend the interrelationship in relation to present-day globalised society, it can appear largely unfathomable how the singular individual participates in the production and reproduction of society. The solution to this epistemological challenge is, according to critical psychology, to consider this relationship as mediated and to develop concepts which can grasp how this interrelationship is "mediated in very complex ways". Two important notions to bear in mind when grasping these modes of mediation are that "we cannot assume human beings are the producers of their life conditions at the overall societal level" and furthermore that each individual is not "directly, without mediation, confronted with 'the' society in its entirety" (p. 20 & 41). The latter aspect, is conceptualised by *subjective reason*

for actions, as "a general meditating level between societal meaning structures and individual life activities" (ibid p. 47). Since the reproduction of the societal conditions no longer depends on the contribution of the singular individual, the societal condition does not "have the character of directly determining their actions, but only of determining societal possibilities for action.". Thus psychological inquiry must be from the standpoint of the subject, as reasons for action can only be given in the first person – my reasons for my actions, grounded in my premises for action in relation to my life interest.

As such, today's society provides the individual with the "freedom" to act differently, or not to act at all: 'You know what, today I think I will be staying in my bed doing absolutely nothing and leave all the reproduction of the society to you guys!'. This might very well be within our "freedom" to do so, but we would still need to provide reasons, "explain for others, for each individual her/himself (…) why they act in the way they eventually do" (p. 41-42) – I am tired, sick, depressed or refuse to be a part of a production which is destroying the world. Even though you may want to continue to stay in bed your capability to do so would still be within the "societal possibilities for action". Restrictions on your possibilities to stay in bed would perhaps be in the form of your boss calling to hear 'where you at' or perhaps your daughter jumping on the bed and your partner urging you to get up and start making breakfast. As such, the societal possibilities of actions as they appear, are within the individual's "immediate life world" or as part of the necessities of everyday life and not as "the totality of societal structures [which] necessarily exceeds the individual's immediate experiences 'on all sides'" (p. 41).

This relation between the necessity of everyday and the possibility to act differently might lead us to potentially pertinent aspects of the relationship between the individual and society as mediated in relation to tackling the phenomenon of global warming from the standpoint of the subject. We can, on the one hand, view global warming as woven into the totality of societal structures, as a consequence of the past hundreds of years of particular modes of reproducing our conditions, hence exceeding our immediate experience. On the other hand, we can simultaneously perceive it from the standpoint of the subject, where the phenomenon can be considered (as something) mediated in our conduct of everyday life – perhaps as the unforeseen consequences of the reproduction of the conditions for our everyday life, as part of the conditions for conducting our lives (for instance, the unstable climate or the implementation of green taxes) or as an "individual need for participating in the political struggle". Thus, concludingly, the concept of mediation might be a way to firstly convey global warming as something we do not conceive in total as a force of nature or a capitalistic system running amok

– in either case beyond our control – but as something which becomes mediated as it, so to speak, comes into contact with the societal meaning structures. Secondly, we can consider how this mediation appears to reflect how global warming seems intrinsically connected to our societal nature of producing and reproducing our life conditions and thus also becomes interwoven into the necessities and possibilities of everyday life.

CRITICAL PSYCHOLOGY AS A PROBLEM-ORIENTED PSYCHOLOGY

Through the conceptualising of the interrelationship between humans and society as mediated, we can perhaps begin to make some preliminary attempts to 'move' global warming from being a condition and convey it as a phenomenon interwoven into the social meaning structure and thus also aspects of subjective reasons for action. Consequently, we can begin to explore how the phenomenon, as mediated, can move from being something beyond our control to something we attempt to regain control over and as something related to possible conflicts which may arise from our shared attempt at gaining control. One could argue that these conflicts already exist, as evident in the ongoing political struggle of deciding the ways to address the challenges it poses. However, what I am searching for is how these conflicts arise on the subjective and intersubjective level as related to our shared participation in reproducing the conditions of our conduct of everyday life. In order to find such perspectives, I will explore how critical psychology not only insists on understanding the world from the standpoint of the subjective, but also commits itself to understanding how problems arise between different standpoints and develop concepts which can assist at dissolving such problems.

While the aforementioned concept of restrictive agency can be construed as somewhat vertical in its notion of power relations and dualistic in its relation to expanding agency, it is once again important to approach it from its mediated form – as it relates to "to the most concrete situations of an individual's life". Here, Holzkamp introduces the concept of *foreshortened reason patterns* as a way of conveying restrictive agency as a subjective and intersubjective problem:

> The initial problem always arises from a somehow foreshortened reason pattern used by the subject in her/his attempts to overcome a dilemma or predicament by direct attempts to extend her/his control over the situation, i.e. lack of consideration of the other's premises and reasons for action so that s/he permanently reproduces the hindrances in the very way s/he wants to overcome them (p. 56-57).

The concept of foreshortened reason patterns allows us to conceive social problems as being related to different subjective standpoints. I have my reasons for actions from my groundedness and you have your reasons for actions from your groundedness, "I am the other for the others" (p. 57), and wedged within lies the conflict. Conflicts are intrinsic to intersubjectivity, as different partial perspectives on the common. Thus, conflict is therefore not an aspect of human cooperation which should be eliminated, but something which can be intensified and reified by continually overlooking premises for others reasons for actions.

As such, the emancipatory ambitions of critical psychology can be located in this conflict of intersubjectivity, with the aim of developing concepts that can "penetrate" bonded reason constellations – thereby challenging foreshortened reason patterns by the "theoretical means to recognize the restrictive impact of these reasons on one's own agency such as the restrictions and contradictions of their life practice (in its relevant aspects) would become surmountable as insights grew into the conditions/premises of more comprehensive possibilities to act" (ibid). Such undertakings start with a "problem, contradiction, or dilemma regarding reasons to act, by which the subject's life practices were controlled by current situations of dependency and thus hampered from developing **their relationship to the world** [my emphasis] and the quality of their lives." Within critical psychology the scientific endeavour depends on the subjective problem in question and its concrete societal-historical context and remains completely open on the "categorial" level of analysis. Such notions raise questions of how one can concede global warming as a *subjective problem*, locate it and analyse the phenomenon in its "concrete societal-historical context", and hereby identify and develop appropriate concepts to understand global warming as a subjective problem, and in the process avoid committing the "*scientific shortcoming*" of asking to global warming's effect on the individual subjects, similar to asking the same questions in regard to "bourgeois class relations or the prevalence of modernity and rationality within society" (Holzkamp, 1998, p.26 – my translation). A possible way to avoid this would be to explore how the phenomenon in its mediated appearances becomes a subjective problem. However, this still leaves us with the question of how we can think of bounded reason constellations and foreshortened reasons for actions in relation to a phenomenon that appears omnipresent. Here, intersubjective conflicts are not only located here and now, but also interlinked across time and space – from the considerations of conditions for life in Bangladesh to future generations. Global warming appears to be a litmus test of our "subjective relationships to their world", when our everyday intersubjective problems not only entail risks to other far-off or future human beings, but also for other species, things, and the actual planetary conditions when land washes away in floods. When taking these

considerations into account, the subjects situated reason constellations not only seem bonded, but also opaque and seemingly impenetrable. In order to grasp global warming as a subjective problem it would thus appear necessary to develop concepts which can situate the phenomenon in concrete *scopes of possibilities* (Dreier, 2013), while still remaining open to the entangled characteristics of the phenomenon.

Perhaps a way to penetrate the "inaccessible strangeness" of global warming is not to approach it as blind conditions beyond our control, but as something which concurrently *conditions* and is being *conditioned* by the reproduction of the societal conditions. Namely as something which has the effect of affecting our conditions, but also something which we can in turn affect by changing the condition for the societal conditions. As such, global warming can be approached as a psychological problem – a problem situated in our conduct of everyday life as it is intrinsically linked to the reproduction of the societal conditions. It can be approached as an intersubjective problem of participating in everyday practices and thus also as a problem of gaining control of the process of production, which has the unfortunate result of dramatically changing the conditions for life on earth.

Chapter Conclusion

The main purpose with this chapter is to establish a tentative critical psychological standpoint from where global warming could be approached. My basic assumption was that a psychology which foregrounds human activity and insists on understanding the reasons for such actions from the person's individual perspective might be allow us to understand this crisis of our own doing as something which is not only due to historical societal developments, but also a result of our everyday actions. I have approached the concept of mediation as a way to draw global warming into the meaning structures in order to make some preliminary attempts to illustrate how we might approach global warming as a phenomenon, which in mediated ways will become aspects of our conduct of life. Moreover, I have explored how global warming may become a subjective, intersubjective, and *worldly* problem and how we need to develop concepts as to overcome such problems. We will revisit these preliminary perspectives in the concluding discussion.

CHAPTER 2: INTRODUCTION TO ENVIRONMENTAL PSYCHOLOGY

The following chapter is an introduction to the mainstream psychological approach to global warming as it is predominantly conducted within the field of environmental psychology. The intention with this chapter is to outline the broad characteristics of this approach and the fundamental concepts and scientific notions which underline this approach. This chapter will take its point of departure in an article by the American Psychological Association (APA), which outlines the central ways in which the APA consider global warming to be a subject matter of relevance to psychology. Next, I will introduce the field of environmental psychology, and thirdly introduce the concept of the 'value-action-gap', which stands as a dominant way of framing global warming as a 'psychological problem'.

The APA on the Topic of Global Climate Change

In *Psychology's Contributions to Understanding and Addressing Global Climate Change* (Swim, Stern, Doherty, Clayton, Reser, Weber, Gifford, Howard, 2011) the APA presents the main ways in which psychology can contribute to curbing the emission of greenhouse gases and mitigating the consequences of global climate change. The article can reasonably be considered a mission statement from the field of psychology on an institutional level, where they define global warming as a problem applicable to psychology inquiry and furthermore point to the ways its entailing problems can be addressed by:

> addressing (a) human causes of, consequences of, and responses (adaptation and mitigation) to climate change and (b) the links between these aspects of climate change and cognitive, affective, motivational, interpersonal, and organizational responses and processes (c) mitigation and adaptation responses to climate change (Swim et al., 2011, p. 241).

From a psychological perspective, the APA considers climate change a "quintessential commons problem" referring to the social dilemma of 'The Tragedy of The Commons'" and its assumptions on how humans in general act in short-term self-interest rather in the long-term interest of the common good. APA sees individuals' self-interest as expressed in their consumption and explains how "Human behavioral contributions to climate change occur through the use of goods and services that directly and indirectly result in fossil fuel

consumption". From this perspective, the APA outlines how psychology can help to analyse and predict behaviour which leads to "climate-driving emissions, by understanding the decision behind individual consumption, such as "individual-level predictors", "context-level predictors" and the instances where individuals do not behave according to "models of economic benefit maximization" (p.243). In order to avoid the most dire consequences of climate change, the APA states how psychology may inform "efforts to mitigate or limit climate change". This is particularly in relation to non-structural "barriers to behavior", which can cause "resistance to change" rooted in a "lack of understanding of climate change", and "habitual behavioral patterns, bounded rationality, affective processes, personal and social motivations, and interpersonal processes". As such, psychology can help us understand "why do people do or do not respond to different types of intervention" and strengthen such interventions by applying behaviour which makes "environmental choices" more noticeable, attractive, and more convenient (p. 244).

In relation to psychology's role in designing interventions, the APA points to the psychological insight into "how people think and feel about climate change, which in turn influences their motivations and behavioral responses to perceived and objective causes and consequences of climate change". People are "notoriously poor at recognizing the causes of their behavior" and as such it is psychology's responsibility to uncover "individual, interpersonal, and social forces capable of explaining and changing human behavior". By identifying such determinants, the APA explains how these can be "utilized" and thereby contribute to the success of interventions by inducing mitigating behaviour (p. 245). In relation to this, the APA points to the importance of the collaboration between different scientific branches of climate science in order to identify and focus on the "changes that have large potential effects on emissions". As a frame of reference, the APA illustrates how "psychological variables" can be implemented into a general equation, "$I = tpn$", to predict the potential outcome of a behaviour change[5] (p. 247). In other words, the APA demonstrates how psychological insight can contribute to the identification of key areas of intervention, by framing the potential reduction in emission as dependent on psychological variables.

[5] By considering the impact of a behaviour change (I) as dependent on the combined effect of people who might adapt to this behaviour (n) "multiplied by technical potential of the behavior to alter emissions and the plasticity (p) of the behavior" (p. 247).

The APA considers psychology to play an important role in confronting the challenges of global warming. The fundamental notions which inform the APA's understanding of how this role is played out are indicative of the influence of environmental psychology. It is these basic understandings I will outline next.

The Pursuit of Pro-environmental Behaviour

The field of environmental psychology is a diverse field and is made up of various psychological approaches (*stimulation theories, ecological psychology, integral approaches, operant approaches etc.*) . In this instance I will only focus on the fundamental assumptions which underline environmental psychology's approach to global warming. The following introduction is based on the chapter *Environmental Psychology* in *The IAAP Handbook of Applied Psychology* (2011) by Robert Gifford, Linda Steg, and Joseph P. Reser[6].

The starting point of environmental psychology is the "transaction between individuals and their physical setting" and how "in these transactions, individuals change their environments, and their behaviour and experiences are changed by their environments". In contrast to more behaviouristic or cognitive approaches, the environment within environmental psychology is not merely considered an outside stimulus to which the individual passively responds, but also one half of an "holistic entity", with the other half being the individuals who "actively cope with and shape environments". Environmental psychology's fundamental view on human nature as a shaper of environment entails a transparent value-laden approach to scientific conduct, where, faced with "the huge cost of misusing nature and natural resources", considers itself "a key component of both human and environmental welfare by not only developing theories and conducting research", but preferably by applying this knowledge in "developing policy or solving local problems" (Gifford, Steg & Reser, 2011, p. 440-41).

This concern for the environment is reflected in the branch of environmental psychology which concerns itself with the challenges of climate change and investigates how these can be overcome by "the means of 'pro-environmental behavior'". Similar to the APA's understanding, environmental problems are construed as rooted in human behaviour and thus the concept of pro-environmental behaviour contains the assumption that, by changing the

[6] Preferably I would have chosen an introduction to environmental psychology that is not co-authored by Robert Gifford. But due the limited access during the Covid-19 pandemic, I was only able to access this introduction.

individuals' behaviour towards more sustainable forms, the problems of global warming will be mitigated. As such, the aim of environmental psychology is to "improve environmental quality via behaviour change" in that it: "(1) selects behavior that significantly affects environmental quality, (2) examines which factors cause those behaviors, (3) applies and evaluates interventions that change these antecedents and the behavior" (p. 445). In developing the instruments of behavioural change, models of human behaviour are applied, which in different ways seek to describe, explain, and predict human behaviour. Among the most prevalent is *the theory of planned behaviour*, which assumes that behaviour is dependent on one's intentions and one leans towards the behaviour which fulfils the intentions with the "highest benefits against lowest costs" (p. 445 with reference to Ajzen, 1991).

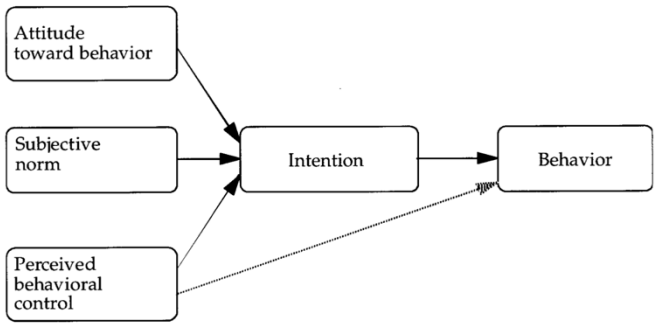


Figure 2
Theory of planned behavior (after Ajzen 1991)

(Appendix 1)

Other models emphasise the importance of values, morals and normative concerns when explaining pro-environmental behaviour. Theories such as the *norm activation model* and the *value-belief-norm theory* assume that individuals engage in sustainable behaviour "when they feel a moral obligation to do so" and hence investigate the drivers that shape such moral inclinations as one's awareness of the problem as "human caused" and a sense of responsibility (p. 446). The different models are presented as having different degrees of prediction in relation to different types of behaviour. Values are good at explaining "low-cost environmental behavior, but less successful at explaining "situations characterized by high behavioral costs (…) as reducing car use". Similarly, the explanatory power of the different dimensions of predictors are scrutinised, such as which types of values (intrinsic vs extrinsic) predict pro-environmental behaviour more efficiently (ibid). A central part of the theoretical development in relation to these models is the integration of past models into new ones, based on the

assumption that models can further be refined by taking more variables into account and thus strengthening their predictive abilities.

The article makes the distinction between two types of intervention: "informational strategies that aim to change prevalent motivations, perceptions, cognitions and norms", and structural strategies that aim to change the context in which behavioural choices are made "by the use external stimuli – by rewarding "approved behavior or punish[ing] disapproved behavior". This can be achieved by the availability of opportunities for pro-environmental behaviour or economic incentives in the form of pricing structures or CO_2 taxes (p. 447-48).

As should be indicative from the above outline, environmental psychology is based on the development and testing of nomological models of human behaviour with the intention of explaining the drivers and factors of pro-environmental behaviour and hereafter applying this knowledge in interventions that can induce behavioural change. However, the challenge of understanding the causes of unsustainable behaviour has somewhat restricted these models' ability to explain how we do not act in accordance to our environmental values. This leads us to the final part of this introduction – to the infamous gap between values and actions.

The Nebulous Value-Action Gap

The dissonance between one's knowledge or values and one's action can be considered a fundamental psychological paradox. Within environmental psychology this discrepancy has been hypothesised as the prevailing hindrance for adapting pro-environmental behaviour and is, throughout the literature, referred to as the 'value-action-gap', 'attitude-behavior gap' or 'intention-behavior gap'[8].

It was James Blake who first coined the term value-action gap in the article *Overcoming the 'value–action gap' in environmental policy: tensions between national policy and local experience'* (1999). Here, Blake contests the assumption underlying previous models, "that humans are rational and make systematic use of the information available to them" and points to "individual, social, and institutional constraints" on pro-environmental behaviour, which he identifies as relating to three barriers of action: "individuality, responsibility, and practicality" (Kollmuss & Agyeman, 2002, p. 246-47). Blake frames the individual barriers as

[8] I will going forward use these terms interchangeably.

"barriers lying within the person, having to do with attitude and temperament", with the barriers of responsibility referring to individuals' lack of self-efficacy or perceived "locus of control", as expressed when "people who don't act pro-environmentally feel that they cannot influence the situation or should not have to take the responsibility for it". The third barrier of practicality relates to "the social and institutional constraints that prevent people from acting pro-environmentally regardless of their attitudes or intentions" (p. 247).

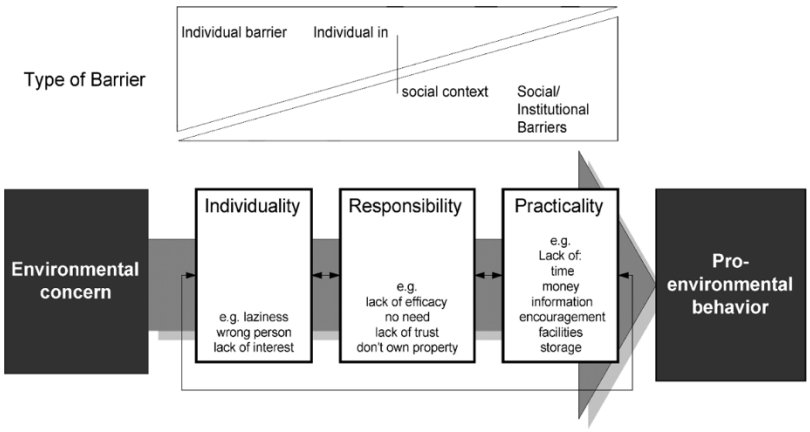


FIG. 5. Barriers between environmental concern and action (Blake, 1999).

(Appendix 2)

While the aspect of the different factors within the framework of the value-action gap does not fundamentally differ from the variables within previous models, the model does mark a break from existing models. Firstly, Blake places the barriers between "environmental concern" and "pro-environmental behaviour" and hereby proposes that people, despite environmental concerns, may not act pro-environmentally, hence *the gap*. Secondly, the model marks a clear demarcation between 'the individual barriers' and the 'social and structural barriers'. As illustrated above, the structural constraints on pro-environmental behaviour exist regardless of attitudes or intentions, just as individual barriers are residing *within* the person, thus construed as something unaffected by any external factors.

The action-value gap can reasonably be considered the predominant framing of the *psychological problem* in relation to global warming. This framing focuses on the intrinsic barriers within the individual, which supposedly hinder us from converting our environmental concerns into pro-environmental behaviour. This focus on intrinsic psychological barriers will be further investigated in the following chapter.

Chapter Conclusion

The purpose of this chapter was to outline how global warming is framed as a problem of relevance to psychological inquiry. I wanted to focus on the fundamental scientific notions which inform this inquiry, as they are expressed in the development of models of human behaviour that can explain and predict pro-environmental behaviour, as well as the gaps which prevent individuals from behaving pro-environmentally. Moreover, I wanted to explore how such models are to be applied in interventions, which can be considered the general way in which psychology can contribute to the curbing of global warming. On the basis of this outline three central perspectives appear to underline the current literature within environmental psychology, which, in conclusion, I will here summarise into three main perspectives:

1. The individual as a consumer

The human causes of global warming are generally seen through the lens of the behaviour of the individual, who, through modes of consumption, contributes to the emission of greenhouse gases causing global warming. This is also evident in the APA approach in the various models of pro-environmental behaviour, which, despite differences in views on humans as rational agents or value-driven, exclusively refer to pro-environmental behaviour in relation to consumption. Thus other aspects of human activity, such as our participating in the production of the products being consumed, are seemingly missing from this perspective.

2. *Behaviour deficits as the psychological dimensions of human-caused climate change*

The mission statement of environmental psychology is to identify the most damaging of human behaviours and apply scientific knowledge in order to describe, explain, and predict such behaviours with the intention of transforming them into pro-environmental ones. As such, the scientific aim is to understand the drivers and determinants of our behaviour, especially those that act as barriers to pro-environmental behaviour. Here the scientific progress is made by the models of behaviour, which theoretically act as frameworks for identifying where within the cognitive process proceeding behaviour the deficits or gaps are located.

3. Psychology's role of making behaviour change

The intention with the models of pro-environmental behaviour is to instrumentalise their predictive capabilities in interventions. The models provide an explanation to how behavioural change is induced and identify which determinants of behaviour to address in order to make

the interventions successful. The capacity of the models to promote change through interventions therefore rests on the models' reliability – their capability to account for all required information pertaining to the specific behaviour as a prerequisite to its ability to explain and predict behaviour.

CHAPTER 3: INVESTIGATING THE DRAGONS OF INACTION

This chapter is an investigation of the influential contribution to the identification and classification of psychological barriers, as developed by Robert Gifford in his taxonomy of *the dragons of inaction*[9]. In this investigation I will examine the development of the theory from its conception as a preliminary taxonomy to its current form as an empirically validated scientific theory. The investigation will be conducted in three steps. The starting point is an examination of the theoretical foundation informing Gifford's seminal paper '*The Dragons of inaction – Psychological Barriers That Limit Climate Change Mitigation And Adaption*' (Gifford, 2011), where he first presented the 'dragons of inaction'. Secondly, I will investigate an empirical study of psychological barriers to food-choice intentions and the notions which underline the attempt to empirically validate theoretical hypotheses. Thirdly, I demonstrate how theory and empirical studies are parts of a movement from preliminary assumptions to scientific models developed according to the scientific principles of nomological models on human behaviour within environmental psychology and, to conclude, point to the implications this approach entails for the psychological understanding of global warming as well as the means of change with which it leaves us.

The Dragons of Inaction

"If so many people are concerned about climate change, the environment, and sustainability, why are more of us not doing what is necessary to ameliorate the problems?" (Gifford, 2011, p. 290). The answer, according to Gifford, is that many people are impeded by a set of psychological barriers that cause inaction. The concept of psychological barriers is Gifford's "suggested elucidation of the hoary mystery surrounding the fabled gap between attitude ('I agree this is the best course of action') and behavior ('but I am not doing it') with regard to environmental problems" (ibid). The key aspects of Gifford's contribution are in its scope and organisation. Gifford has identified a total of 29 psychological barriers, which are organised

[9] Web of Science names *The Dragons of inaction – Psychological Barriers That Limit Climate Change Mitigation And Adaption*' as a 'highly cited paper' and according to Google Scholar the paper has been cited by 1173 as of May 2020.

into seven types. Gifford names his taxonomy "The dragon family of seven genera with 29 species", with the seven genera being: limited cognition, ideologies, comparisons with others, sunk costs, discredence, perceived risk, and limited behaviour (p. 291). Gifford uses the metaphor of dragons to emphasise how psychological barriers, similar to the mythological beasts, can take on different forms and, as depicted in western culture, stand as an obstacle between humans and their desired "goal". With this imagery, Gifford presents the distinctiveness of the seven dragons and how they manifest themselves in the various types of psychological barriers, as illustrated in the table below.

Table 7.1 **The dragons of inaction as of 2011**

Limited cognition	Ideologies	Comparisons with others	Sunk costs	Discredence	Perceived risks	Limited behavior
Ancient brain	Worldviews	Social comparison	Financial investments	Mistrust	Functional	Tokenism
Ignorance	Suprahuman powers	Social norms and networks	Behavioral momentum	Perceived program inadequacy	Physical	Rebound effect
Environmental numbness	Technosalvation	Perceived inequity	Conflicting values, goals, and aspirations	Denial	Financial	
Uncertainty	System justification		Place attachment[a]	Reactance	Social	
Judgmental discounting					Psychological	
Optimism bias					Temporal	
Perceived behavioral control/self-efficacy						

(Appendix 3)

Overall, the dragons of inaction can be seen as a two-fold attempt by Gifford to overcome the gap between attitude and behaviour: first, by outlining the theoretical framework which can explain the psychological barriers causing inaction, and second, as the basis of the development of a scientific method, which allows the barriers to be studied on the behavioural level and from here to design and conduct interventions in order to induce behavioural change. The theoretical foundation of Gifford's taxonomy is based on various theories pertaining to human cognition and modes of behaviour, which are used to explain how the different barriers manifest themselves between attitude and behaviour. Gifford defines two general characteristics of the psychological barriers. First are psychological barriers to be distinguished from structural barriers, as in structural "behavioral deficit (…) beyond an individual's reasonable control". Structural barriers occur in the instances of not being able to afford solar panels on a low income and the lack of public transport in rural areas. While Gifford acknowledges the significance of such barriers, he claims that:

> However, for almost everyone who is not severely restricted by structural barriers, adopting more pro-environmental choices and behaviors is possible, but this adoption is not occurring to the extent necessary to stem the increasing flow of greenhouse gases and other environmental damage. Thus, the question remains: What limits more widespread mitigation, adaptation, and sustainability actions on the part of individuals for whom such actions are feasible? (p. 290)

Gifford considers the psychological barriers to be the cause of inaction when one cannot point to any obstructing structural barriers and thus the deficit must be located "on the part of individuals" within the psychological process leading up to the behaviour. Gifford suggests that the barriers of inaction can be divided into three phases, each representing a common form of inaction:

> Genuine ignorance certainly precludes taking action. Then, if one is aware of a problem, a variety of psychological processes can interfere with effective action. Finally, once some action is taken, it can be inadequate because the behavior fades away, makes too little a difference in the person's own carbon footprint, or is actually counterproductive (p. 291).

Gifford states how his preliminary taxonomy "cries out for organisation" (p. 97). Here, he discusses whether current models of pro-environmental behaviour, such as the aforementioned theory of planned behaviour and value-believe-norm model, are possible starting points. He also addresses whether the existing models are sufficiently comprehensive to grasp the multitude of barriers and how such models can be expanded without sacrificing the "cardinal virtue" of *parsimony*. Gifford furthermore discusses the models' strengths as causal explanations of behaviour and, similar to the general consensus within the field, he points to various strengths and weaknesses within the different models, reiterating that some models are better at explaining some types of behaviour than others. In relation to means of intervention Gifford refers to the idiomatically named "DORITE model" which, informed by a behaviouristic approach, highlights the steps involved in changing behaviour:

> Analyze specific barriers at the behavioral level. Define very specifically the behavior that is holding individuals back from more climate-friendly choices in transportation, food, energy, and other carbon-reliant aspects of our lives, then observe and record it, intervene, test the intervention's impact, and evaluate the program (p. 298).

Such interventions can be in the form of providing information of the carbon costs of the behaviour or by reinforcement of pro-environmental behaviour by the means of a "program that changes the consequences of engaging in that behavior" (p. 297). In any case the underlining logic seems to be that, by the identification of barriers to pro-environmental

behaviour and the implementation of interventions, the barriers causing inaction can be circumvented by manipulating the behavioural conditions. On the basis of these steps Gifford concludingly points to "five essential strategies"[10] to scientifically induce pro-environmental behaviour. If these are adopted, Gifford is confident that "the dragons of inaction can be beaten back, if not slain" (p. 298).

Since their initial conception 'The Dragons of Inaction' have, so to speak, evolved to be a prevalent psychological understanding of our environmental inaction. However, there nevertheless appear to be issues within the taxonomy's theoretical foundation. In the following section I will focus on two aspects which I consider problematic: *The internal incoherencies within the theoretical framework* and *its reduction of complex problems into binary solutions.*

AN ECLECTIC HYBRID

Due to the variety within the broad range of psychological theories and empirical findings which make up the theoretical foundation of Gifford's taxonomy, the overall theoretical framework can be considered to be eclectic in its construction. As a result of this eclectic use of sources to claim the existence of the different psychological barriers, I would argue that when these components are viewed as a whole, the theoretical foundation appears internally incoherent.

The first dragon genus Gifford presents covers the various ways our *limited cognition* is causing psychological barriers, with the barrier of our *ancient brain* as the perceivable root cause. Gifford states that the human brain has not evolved since before the dawn of agriculture and, as such, is still predominately attuned to immediate needs and danger. Gifford uses this conception to state that the capacity of our brain is at odds with being "concerned in the 21st century, about global climate change, which is slow, usually distant, and unrelated to the present welfare of ourselves and our significant others. Obviously, our ancient brain is *capable* of dealing with global climate change, but doing so does not come easily" (p. 291). Many objections can be raised against the notion of the ancient brain and, even though Gifford softens

[10] 1) analysing the "specific barriers at the behavioral level" 2) inform consumers of "the carbon cost associated with various behavior choices" 3) improve "messaging strategies" in order to raise public support 4) "design and conduct more intervention studies", and finally 5) collaborate "with other disciplines, with government agencies, and with technical expects."

his argument, it still entails a view on the last 10,000 years of human development as a history of defiance, with our concern and engagement with future times, whether it be terrestrial concern for the environment or of a more theological nature being framed as epiphenomena. This general critique aside, the premise of the ancient brain still seems to flounder both within the category of *limited cognition* and compared to the basic assumptions supporting the other categories – differences aside they all presuppose a brain, even an ancient one.

Environmental numbness, *uncertainty*, *optimism bias*, and *perceived behavioural control* are other manifestations of our limited cognition. Environmental numbness can be seen as support of the ancient brain argument in the form of a theory of perception. Stating that "environmental cues" exceed what the "individual can wholly monitor", human perception thus gravitates towards environmental aspects causing difficulties, in the process leaving out other remaining aspects. As "a phenomenon outside immediate personal difficulties" global warming can be considered one of the omitted aspects, thus preventing us from taking action (p. 292). Moreover, Gifford continues to explain how judgmental discounting in the form of undervaluing "distant or future risk" stands as a barrier, just as our individual optimistic outlook on the future, our *optimism bias*, and our *perceived lack of control* when it comes to doing something about climate change are also barriers of inaction. At first glance, our perceived tendency to discount future risks might seem to support environmental numbness. However, the very notion of valuating future scenarios presupposes a perception of the environment as being both related to the present and future (and the past for that matter) – the ability to weigh a current state against one's understanding of potential future states. A beautiful tree on a summer day does not cause me any difficulties, but the thought of not being able to lie in the shade of its branches with my daughter just I did with my father when I was a child causes me concern. But I don't see how I can prevent the increasing rainfall from flooding the fields where it solitarily resides, which makes me move past the feeling, hoping the future will turn out differently.

Similar inconsistencies seem to appear when we hold the notion of the ancient brain up against some of the other dragons of inaction, such as *perceived risk*. Similar engagement in connecting present actions with possible future consequences can be seen as a central aspect of individuals' *perceived risk* of "changing a behaviour as a step toward reducing their greenhouse gas emissions" (p. 296). Here Gifford puts forward the different types of risk associated with changing one's behaviour and thus potential barriers for committing oneself to such change. If someone were to pursue the possibility of buying "a plug-in electric vehicle", then that person

might be concerned by the *functional risks* of relying on batteries and the availability of charging stations, along with the *financial risk* of investing in a car more expensive than "equivalent gas-powered vehicles". All this amounts to the "nontrivial amount of time deciding whether to buy a PHEV" (ibid). Not only should this example illustrate how such decision-making exceeds immediate needs and fears, but it is also indicative of a logical reasoning, which may not be perfect in a strict rational sense, but nevertheless does not appear to be limited by the person's ability to anticipate and evaluate one's actions on the basis of a broad range of possible factors and in relation to a multitude of possible future scenarios.

The notion of the ancient brain holds an immediate strong explanatory force. If we are limited in our cognitive abilities it makes, at face value, perfect sense why one might struggle to turn our environmental concerns into pro-environmental behaviour. However, just as this notion appears to struggle as the root cause of our cognitive and behavioural deficits it also runs into problems when Gifford attempts to account for behaviour change.

BINARY ANSWERS TO COMPLEX PROBLEMS

Gifford's approach to the psychological dimensions of global warming is permeated by a clear distinction between good and bad, i.e. good altruistic environmental values and bad capitalistic fossil-burning values – undesired *anti*-environmental and desired pro-environmental behaviour. Taken at face value this dichotomy makes sense as it clearly reflects the purpose of Gifford's taxonomy – to understand the psychological barriers causing inaction and to develop the means to overcome them. However, some concerns can be raised regarding Gifford's strict dichotomy between fundamentally right and wrong as I consider it to reduce the complexity of the challenges that we are facing. I will attempt to demonstrate this by showing how Gifford explains our inaction as irrational and concurringly alludes to how pro-environmental behaviour must be founded on more rational decision-making.

In relation to a number of barriers, Gifford refers to different experimental research projects on resource dilemmas as examples of how humans make irrational choices in relation to environmental issues. This is the instance in relation to *uncertainty* as a psychological barrier, where Gifford infers the following on the basis of a setup which measures how "perceived or real uncertainty reduces the frequency of pro-environmental behavior":

> Individuals tend to interpret any sign of uncertainty, for example in the size of a resource pool or the rate at which the resource regenerates, as sufficient reason to harvest at a rate that favors self-interest rather than that of the environment (Gifford 2011, p. 292).

Here Gifford conveys these findings under very specific conditions as demonstrating an assumed generalised tendency of self-interested and irrational behaviour in the instances of uncertainty. Furthermore, in relation to *sunk costs*, which covers the ways in which humans are reluctant to abandon behaviour in which they have invested time and money, Gifford refers to the "cardinal example" of not wanting to give up a new car, even while being aware of its negative environmental impact. Here Gifford states that the "Economists point out that the rational choice is to dispense with the sunk cost and move forward, but most people choose instead to hold on to the sunk cost investment, at least until its disadvantages become too painful"(p. 294). This exemplifies how Gifford, in one stroke, demonstrates how our limited rationality causes us to misbehave and at the same time assess the behaviour from the perspective of a rational economical agent. In other words, Gifford simultaneously states the irrationality of human nature while holding individuals up to the standard of a theoretically abstract homo economicus.

The same logic appears to underline Gifford's explanation of how individuals who are engaged in pro-environmental behaviour are still limited in their behaviour. Here, Gifford points to the barriers of *tokenism* and *the rebound effect* as explanations to the persistency of inaction, when "most people could do more than they are doing" (p. 296). In relation to the latter, Gifford once again finds a theoretical footing in a resource dilemma study, where "participants who had been warned about the decline of the resource restricted their harvests for a few seasons but then returned to prewarning levels soon after" (p. 297). Thus, Gifford again refers to our irrational behaviour, which in the case of the study can lead to a stage of contentment in our environmental engagement. Or even cause an increase in our emission of greenhouse gases in the instances of the "Jevons paradox", where "for example, persons who buy fuel-efficient vehicles may drive farther than they did when they owned less efficient vehicles (p. 296). Tokenism, on the other hand, occurs when individuals display mitigative behaviour, but as "Some climate-related behaviors are easier to adopt than others but have little or no impact", the "Pro-environmental intention may not correspond with pro-environmental impact" (ibid). At this point one might begin to feel some sympathy for the individuals as they are brought to task by Gifford for both lacking perseverance and decision-making ability. Gifford appears to

implicitly compare the behaviour of the individuals with some sort of demigod able to simultaneously perceive the events of the past, present and future – thus able to account for all possible outcomes and on such grounds choose the proper cause of action.

In relation to the barrier of *ignorance*, Gifford somewhat acknowledges the complexity of the issues we are facing and consequently the difficulties of deciding on the proper cause of action given that "most people are not technical experts" and some media and interest groups conduct "well-funded attempts to undercut science" (p. 291-92). However, such uncertainties as influencing the individual's decision-making are disregarded in Gifford's evaluation of the individual's behaviour. As a result of this detached view, with the rational agent as the gold standard, the decisions faced by individuals appear binary ones. There is the unsustainable choice of behaviour and then there is the correct pro-environmental behaviour as seen from Gifford's vantage point. If we follow the logic of this binary construction, then we must assume that the proper cause of environmental action is known and ascertainable. Thus, any failed attempt must fall either within the category of ignorance or irrational decision-making. If the individual is not aware of the ways in which a form of behaviour is related to climate change, then such a gap should be overcome by education – by providing the individual with the necessary knowledge to make such connections. And if we assume that the individual is aware of all pertinent aspects and the inaction is in fact caused by a faulty decision-making, then the only solution appears to be in the forms of intervention, which ensures that the individual despite their irrationality engages in pro-environmental behaviour.

PRELIMINARY CONCLUSION – THE GAP REMAINS CLOUDED

Gifford introductorily refers to findings from studies, where "almost everyone agrees that they could do more." (p. 296). I think many can relate to this sentiment and thus it stands as an interesting point of research – how come we find ourselves in this predicament? What causes the gap? To explain this phenomenon Gifford presents his seven dragons of inaction covering the psychological barriers that hinder pro-environmental action. At face value the barriers identified by Gifford do seem to point to aspects of why we struggle to walk the walk. Even the notions of the ancient brain and its limitations, which I have held under much scrutiny, resonate with my own question of how we are to grasp a phenomenon so far beyond our immediacy and let alone act upon it. However, in the process of establishing an explanatory theoretical foundation for the dragons of inaction, I do think the barriers lose their relevance as

an aspect of the individual's attempts (faulty perhaps) of translating an ominous concern into concrete actions. Gifford view appears to be elevated from the situation in which the psychological barriers manifest themselves. And from this rational vantage point he is able to distinguish the pro-environmental behaviours from the non-environmental ones, just as he is able to determine the most impactful behaviour available. This insight is to be applied in interventions, with the intention of inducing pro-environmental behaviour in cases where individuals are hindered by psychological barriers. However, in order to induce such changes, the barriers must be identified at a behavioural level. And it is exactly such an identification which I will examine next.

Do Dragons of Inaction Exist?

Since the conception of Gifford's taxonomy several empirical research attempts have been made to not only empirically confirm the assumption that psychological barriers hinder individuals' pro-environmental behaviour, but moreover if the psychological barriers empirically cluster into parsimonious structures as hypothesised in Gifford's preliminary taxonomy. In the following, I will critically examine such an empirical study, which looks at psychological barriers in relation to climate-positive food choices. This particular topic is chosen for a number of reasons. First, it is representative of how empirical studies on a broad scale are conducted within environmental psychology by the use of online surveys. Secondly, it is indicative of how models of behaviour are tested and further developed on the basis of empirical studies. The structure of this part of the investigation is as follows: First I will outline the study, its results and the conclusions drawn on the basis of these findings. Second, I will frame their study as being representative of a decontextual approach dominant within environmental psychology. From here I will, on the basis of perspectives from Klaus Holzkamp critique of variable psychology, challenge the study's ability to provide insight into the attitude-behaviour gap.

As to this premise of my investigation, I wish to be transparent in my limitations for conducting this critique. The methodology of the study is statistically founded. I have no formal training in such procedures, hence my understanding is on a very rudimentary level. As such, I will not investigate the methodological procedure per se, but rather examine the basis on which they claim to empirically validate their theoretical assumptions.

PSYCHOLOGICAL BARRIERS TO CLIMATE-POSITIVE FOOD CHOICES

In the paper *Why aren't we taking action? Psychological barriers to climate-positive food choices* (Gifford & Chen, 2017) Gifford and Angel K. Chen present their findings from a study examining psychological barriers in relation to individuals' food choice. The study examines a total of 36 psychological barriers'[11] effect on mitigative food choice intentions (MFCI) with the intention of testing three proposed hypotheses:

> The first was that each of the 36 individual perceived barriers will be associated with fewer mitigative food choice intentions. The second was that these 36 barriers can be empirically reduced to a simpler set of basic dimensions, given that some barriers may be related to each other (e.g., perceived financial risks may be associated with conflicting goals) (…) The third was that the combined barrier dimensions would predict MFCI. (p. 167).

Gifford and Chen frame their study as an empirical investigation of the psychological barriers' ability to account for attitude-behaviour gap, with the assumption being that by taking barriers into account as an intermediate factor, the correlation between attitude and behaviour can be strengthened (p. 166). The study is based on an online survey, where 251 participants were asked to express their intention of engaging in six different forms of mitigative food choices for a month[12]. Next, the participants are asked to choose among 36 barriers constructed as statements and asked to report to what degree they perceived each barrier as limiting their intentions (p. 168). The results show that "the participants reported moderate levels of mitigative food choice intentions", with the intentions of purchasing food with less packaging as well as locally grown food being the two most reported mitigative food choices. In relation to the barriers, the participants ratings were on a 1-5 likert scale, and here the results show that their rating in average is "slightly below midpoint" ($M = 2.36$).[13]

On the basis of the descriptive results, Gifford and Chen test their three hypotheses, finding that they are able to confirm all three. The first hypothesis can be considered their attempt to empirically verify that psychology barriers have a negative effect on individuals' MFCI. Here, they find that 29 of the 36 barriers negatively correlate with MFCI as well as on average across all perceived barriers ($r = -.49$) (p. 170). The second hypothesis relates to the aim of

[11] The 29 barriers identified by in Gifford's preliminary taxonomy plus an additional seventh barrier assumed to be related to food choice.
[12] Purchase organically grown food, not purchase locally grown food (reversed), eat less meat, not reduce how often to dine at restaurants (reversed), increase consideration of the environmental impact of their food, and purchase food that has less packaging (p. 168).
[13] See appendix 4.

parsimonious models and the attempt to reduce observable barriers into a lower number of latent factors. To test if the barriers form such underlying factors, Gifford and Chen use a *principle component analysis* to see if the variance among the barriers cluster into meaningful dimensions. They find that a four-factor model is able to explain 49% (17 of 36 barriers) of variance, with the factors being *denial* (36%)*, conflicting goals* (6%)*, tokenism* (4%), and *interpersonal influences* (3%). The table below shows how the different barriers (items) load into the four factors and how the co-variance between the items forms the factors[14] (p. 171).

Table 2 Factor loadings for the 4 barrier dimensions ($N = 251$)

Items	F^1	F^2	F^3	F^4
35. Humankind cannot make a difference when it comes to saving the earth, so there is no point for me to change.	.82	.27	.14	.12
27. There's no need to change because the current "environmental crisis" has been exaggerate	.70	.11	.46	.17
31. Honestly, I don't think that the "problem" that this would solve is actually a problem.	.72	.25	.46	.21
36. Only fake experts promote these changes.	.70	.28	.34	.17
1. There's no need to make these changes because I'm not convinced that a serious environmental problem even exists.	.66	.12	.48	.20
11. If I made the necessary changes, I probably would be embarrassed when others noticed what I was doing.	.25	.13	.00	.80
8. Making these changes would be criticized by those around me.	.08	.19	.05	**.77**
14. It's too difficult for me to make these changes.	.09	.74	.15	.17
29. Even if I decided to make these changes, there would be too many other obstacles to overcome.	.30	.69	.24	.21
16. I haven't done this mainly because changing involves some risk.	.33	.66	.04	.36
25. I'm concerned that these changes will take up too much of my time.	.36	.66	.07	.24
22. I have spent quite a bit of money on my current choices, so I would lose too much if I changed now.	.34	.63	.13	.21
5. I'm content with the extent to which my current choices reflect who I am as a person.	.06	.02	.78	.02
23. I'm satisfied with my current way of doing things.	.30	.21	.67	.03
17. My environmental actions already make enough of a difference.	.13	.34	.55	.03
28. I'm unsure that these changes would be an improvement over my current choices.*	.50	.38	.47	.20
2. The pro-environmental behaviours that I currently engage in make further changes unnecessary.*	.28	.03	.45	.07
M (*SD*)	2.01 (0.-97)	2.20 (0.-83)	2.89 (0.-75)	2.92 (1.-94)

Note. Factor labels: F^1 = Denial F^2 = Conflicting Goals F^3 = Tokenism F^4 = Interpersonal * added to increase construct validity

(Appendix 5)

Moreover, to confirm that this four-factor model can be theoretically substantiated, they perform a *confirmatory factor* analysis, where they test the four-factor model with two

[14] For instance, Factor 1 has high loadings on items no. 35, 27, 31, 36, and 1, which in other words expresses that given the type of barriers these items represent and the strong correlation between them it can be considered *meaningful* or *statistically significant* to assume that they together form the factor of Denial.

competing models; the original seven-factor taxonomy by Gifford and a one-factor model, in order to see if these models can also account for the variance. Both the four- and seven-factor models show "superior goodness of fit", while the unidimensional one-factor model did not (p. 172-73).[15] On the basis of the good fit from both the four- and seven factor models, they test their third and final hypothesis regarding psychological barrier dimensions' ability to predict MFCI on both models. A *multiple linear regression* analysis shows that the models "appear to have equal validity", with the factors Denial and Discordance having the highest "regression weight", i.e., appearing to affect the participants' MFCI the most. While they find evidence to support that the other barrier dimensions, although to lesser degree, also negatively affect MFCI, neither model shows significant correlation between MFCI and the factor of interpersonal influence/comparisons (p. 173-74).[16]

In the discussion of their findings, Gifford and Chen make some remarks on why Denial was "the strongest perceived barrier to mitigation". Here they emphasise that the dismissal of the problem is a "major obstacle to the positive reception of environmental communications" and further that "Climate change denial may be particularly resistant because the proclivity to remain apathetic, indifferent, or even block out the problem implies that denial serves as a defence mechanism for negative emotions associated with problem awareness" (p. 175). Moreover, they discuss why Interpersonal Influences did not appear to effect MFCI, when food is commonly considered "a very social activity". They explain this deviance by alluding to the possibility "that individuals are often unaware that the presence and behaviours of others can have a strong impact on their food consumption choices, and many of them attribute to other factors, such as taste, costs, and health impacts" (ibid).

Although Gifford are Chen are able confirm their three proposed hypotheses, they do not make any definitive claims on the basis of their findings, but rather concludingly point to how the study offers "new avenues for future scientific endeavor in this area" and reiterate how "Understanding psychological barriers may be one significant path toward fostering behavior change that would decelerate climate change" (p. 176.) This tentative conclusion indicates a somewhat strange juxtaposition in their approach to their findings. They are able to verify their hypotheses, but simultaneously appear reluctant to draw anything conclusive. In the following

[15] See appendix 6.
[16] See appendix 7.

I will attempt to demonstrate how this equivocation could be due to the fact that their research findings do not provide them with any new insight, but merely confirm what they already know.

A DECONTEXTUAL RESEARCH APPROACH

The use of online surveys to test the validity of theoretical models is, despite critical remarks within the field, a prevailing method to measure pro-environmental behaviour (Steg & Vlek, 2009). As the present study asks the participants to express their intended food choice and their perceived barriers, the design can be considered an "intent-oriented" measurement of pro-environmental behaviour (Lange & Dewitte, 2019). The critique raised against this type of measurement is that it fundamentally measures "verbal behavior (rather than behavior with actual environmental consequences)" (2019, p. 94) and that there is not necessarily any correlation between the two types of behaviour. This limitation also entails implications for the method's ability to establish causal relationships between barriers and displayed behaviour. To what degree the participant expresses his intention of purchasing locally grown food and his perceived barrier to this behaviour, fundamentally tells us no more than how the participant, at the moment he participates in the online survey, thinks he might act in a hypothetical situation and the reasons he might have to act in such a manner.

Clayton et al. (Clayton, Devine-Wright, Swim, Bonnes, Steg, Whitmarsh, & Carrico, 2015) state that the psychological research approaches to global warming are divided, which they consider to be founded in a "divergence in the view of the person implicit in psychological understandings." (2016, p. 11). The common approach is the *decontextualized* approach, where the psychological processes (e.g., values, beliefs, norms and attitudes) can be abstracted from their specific context as they are extracted from experimental setups or questionnaires. The other, but increasingly less prevalent, contextual approach takes a fundamentally different starting point—"a conception of the *person in a place*." While Gifford and Chen convey their study as an investigation of psychological barriers in relation to "a specific ameliorative behavioral intention," it appears reasonable to consider their study decontextual in its approach. Clayton et al. point to the risks of a re-enforcing effect, where the prevalence of the decontextualised approach strengthens its position as the dominant one. However, I would argue that this critique can be further extended in relation to the study by Gifford and Chen, given that I consider that their decontextual approach limits their ability to gain insight into the psychological barriers.

To support this claim, I will draw upon some of the central points from Klaus Holzkamp's critique of *variable psychology* (Holzkamp, 2003). The term variable psychology covers what, from Holzkamp's point of view, is the dominant scientific approach within psychology. According to Holzkamp, science is based on concepts and methods that "differ from pre-existing everyday assumptions about a particular issue" and allow one to "move from the level of these everyday assumptions to scientific ones" (Holzkamp, 2013, p. 60). Holzkamp considers the root problem of variable psychology to be located within this movement from everyday assumptions to scientific ones. The problem occurs when the "actual scientific work" begins:

> When hypotheses of the empirical connection between conditions and events have been derived from theoretical assumptions and been "operationalized" as if-then-statements (i.e. conceptualized as independent and dependent variables) within a research design which allows the hypotheses to be tested according to the rules of inferential statistical procedures (p. 60).

What Holzkamp probes at is psychology's self-understanding as an empirical science and the grounds upon which psychological research claims to find scientifically valid and generalisable knowledge based on empirical tests. Consequently, he considers variable psychology to ground its scientific claims in the "'variabilization' of theoretical concepts", and its aim of the "*statistical processibility* and measurability of the results as a criterion of their scientific tenability" (p. 64). However, through this process, Holzkamp reasons, one becomes blind to the "coherences and hence also the contradictions within the subject area to be explored", as the rules of inferential statistics require "the random variability of all influences assumed". By coherences, Holzkamp refers to "the concrete-historical coherence structure" of the particular subject area. This could, for instance, be individuals' mitigative food choices in a particular supermarket in a particular demographical location anno 2020, with a contradiction being that the only organically grown bananas available are wrapped in plastic. But such aspects are, according to Holzkamp, disregarded in the statistical process when all aspects are isolated and made eligible to a random distribution. Thus, he considers any subsequent "theoretical construal of coherences" to be the result of "the researcher's constructions, which s/he imposes on the data from outside after it has been made incoherent" (p. 64-66). It is important to note that one of main points of Holzkamp's critique is directed towards the aim of statistically inferring from the instance of one sample to the population in general. This critique is not

applicable to the present study by Gifford and Chen, since their design is solely descriptive. However, as the statistically procedures used by Gifford and Chen strongly resemble the procedures of variable psychology, I find that aspects of Holzkamp's critique can provide some reasonable explanation as to why their study does not appear to provide them with any new insight. I will attempt to illustrate this in relation to *denial* as the strongest predicator of weak MFCI as well as Gifford and Chen's inability to account for *interpersonal influences*.

The use of variables, of arranging research data into independent and dependent variables, is, according to Holzkamp, a dominant way of constructing one's research findings in such a way that researchers are able to measure and make predictions on the basis of their data. Holzkamp considers the relationship of variables as "empirical contingent if-then statements" (p. 74) – as a causal relationship akin to what Gifford and Chen are attempting to establish between the barrier dimensions and the participants' food choice intentions. This relationship is established when they test if the factor dimensions, as the independent variable, predict the dependent variable of the participants' food-choice intentions. As mentioned previously, their regressions analysis finds that factor models are able to account "for a significant amount of variance in MFCI", with the four-factor model explaining 25% of the variance. However, their analysis also shows that the dimension of Denial has the "largest regression weight", i.e., denial is the factor which is the main predictor of the participants' intention to purchase mitigative food options in terms of explaining the variance (2017, p. 173).

Table 4 Standard multiple regression of barrier factors for the two models predicting Mitigative Food Choice Intentions (MFCI) ($N = 251$)

	Predictors	Items	α	Pearson *r*	β	*b*	*SE b*
Model 1	Denial	5	.89	–.48***	–.34***	–.42	.10
	Conflicting goals	5	.82	–.36***	–.17*	–.24	.10
	Tokenism	5	.74	–.39***	–.11	–.16	.12
	Interpersonal	2	.66	–.07			
Model 2	Limited cognition	2	.75	–.42***	–.04	–.05	.12
	Ideologies	2	.65	–.36***	–.16*	–.20	.09
	Sunk costs	3	.78	–.35***	–.15*	–.19	.10
	Discredence	3	.85	–.48***	–.31**	–.36	.12
	Perceived risks	2	.60	–.30***	–.05	–.08	.11
	Limited behavior	3	.59	–.33***	.04	.06	.12
	Comparison	2	.66	–.16			

Note. For Model 1, $R^2 = .26$, Adj. $R^2 = .25$; For Model 2, $R^2 = .28$, Adj. $R^2 = .26$; Interpersonal and Comparison were removed from the analyses; $^{**}p < .001$,$^{**}p < .01$ $^{*}p < .05$

(Appendix 7)

As Gifford and Chen themselves point out, denying global warming or dismissing it as a problem is a major obstacle to mitigative behaviour. However, one could also consider not seeing it as a problem, i.e. a reason for not engaging in any mitigative behaviours. Holzkamp argues that causal if-then relationships are in fact reason-patterns construed as contingent relationships, which can be revealed by interpolating "'reasonably' (…) between the if- and then-component" (2014, p. 309). If we attempt this by framing the assumed causal relation between denial and MFCI as a reason structure, it would go as follows: 'If one does not consider global warming a problem that humans can make any difference to, then it appears reasonable not to have any intention of engaging in mitigative food choices'. One could disagree with such a reasoning, but nonetheless it appears to be a logically sound one. If we consider the relation between the factor dimensions and MFCI as a reason relationship, then it provides us with an insight into what the participants of the online survey predominately choose as reasons, among the available (reason)-statements for reporting low MFCI. If we accept this logic, it thus appears reasonable not only to question whether the participants' actual behaviour can be predicted on the basis of their expressed intention, but also whether Gifford and Chen gain any new insight from the fact that denial is a dominant reason for the participants' limited MFCI. Denial as a central factor does not appear to make any elucidation to the gap between attitudes and behaviour. Rather, it appears to be a factor residing outside and prior to the gap, if we consider denial to be a reason or expression of one's intentions. As such, they can only reiterate what is already known – that denying the problem is major obstacle and attempt to explain its prevalence by second-hand assumptions of defence mechanisms, which holds no relation to their own findings.

In a similar fashion, Gifford and Chen discuss how the factor dimension of *interpersonal influences* does not show any relation to MFCI since food is generally considered a social activity. As mentioned, they rather arrogantly draw the assumption that this deviance must be due to people's tendency to be ignorant of others' influence on their food choices and pertaining their choices to "other factors, such as taste, costs, and health impact" (2017, p. 175). However, I would argue that the very explanation with which they dismiss their inability to measure interpersonal influences points to the limitations of their methodological approach. Specifically, that individuals' might attribute social factors to their food choice, but also taste, costs, and health impact may very well indicative be of, in Holzkamp's terms, the internal coherence and contradictions of buying food or the contextual *person in a place*. When measuring intention via statements in a survey, one could ask if they are in fact measuring the

participants' attitude. The attitude is expressing their intention of engaging in the six hypothetical food choices, but barely provides any insight into how the participants would act in the concrete situation: the everyday situation of grocery shopping in the supermarket with aisles upon aisles of things you do not necessarily need, but are incentivised to buy. One sign might promote organic beef from the local farmer, while the next informs you that the price of three packs of chicken drumsticks is the same as the price of one, encouraging you to buy in bulk when you only really need one. Moreover, it is a situation where you have to integrate your conflicting goals of buying environmentally friendly as well as healthy food. For instance, you may have the intention of buying steaks and sausages for tonight's barbeque, because this is the norm and you think your guests are expecting, but as you can barely afford to buy organic meat let alone for a whole dinner party, you decide to buy the conventional steaks and tell yourself that this is a one-time only.

My intention with this hypothetical situation is to demonstrate how measuring the intention of isolated food choices scarcely provides any insight into the various aspects one would have to take into account when shopping for groceries. How this approach is unable to grasp how the factor dimensions of conflicting goal, tokenism, and interpersonal influences may very well cause gaps, as in integrating contradictory intentions under a specific circumstance into a coherent behaviour. Such insight differs vastly from the forms of intentions Gifford and Chen are able to account for by virtue of their decontextual research approach. Even if one were to dismiss the notion of perceived barriers as expressive of reasons, it is difficult to not to interpret these factors' lack of prediction as indicative of the fact that their study is not grasping the crux of the problem. Consequently, Gifford and Chen's decontextual research fundamentally seems to isolate them from exploring the psychological barrier dimension within the gap between attitudes and behaviour.

PRELIMANARY CONCLUSION – MISSING THE GAP

By conveying the barrier dimension of denial as a reason for the participants' limited MFCI, I have attempted to demonstrate how Gifford and Chen's findings do not appear to provide them with any answer to the attitude-behaviour gap, despite confirming their hypothesis of barrier dimensions' predictability of MFCI. By analysing the barrier dimensions on the level of intention as causally effecting behaviour, I would argue that their study does not pertain to the attitude-behaviour gap as they are only able to analyse intentions as expression of attitudes – as abstract reasons provided in an online survey and not reasons as they relate to concrete food-

choice situations. Therefore, it can be questioned whether their study is actually able to measure and predict behaviour by asking to participants in an online survey regarding their intentions and their reasons for them. Hence, their findings ultimately appear to only reconfirm that people who do not consider global warming a problem, does not hold any intention of engaging in pro-environmental behaviour. Gifford and Chen concludingly write that "when facing global environmental challenges, reluctance to change appears to be a status quo bias" (p. 176). However, this status quo also seems to be the only steadfast conclusion they can draw on the basis of their findings as their measurement of individuals' intention is devoid of any insight to such reluctance and limited to reconfirming its prevalence among individuals who does not see the problem as being a problem.

Making the Ouroboros

In this concluding part on the dragons of inaction, I will investigate them as a process of theory making – how the dragons of inaction have developed from their preliminary taxonomy to, through empirical tests, a scientific model validated by empirical findings. I will examine this development on the basis of how it is conveyed in '*Understanding responses to climate change: Psychological barriers to mitigation and a new theory of behavioral choice'* (Gifford, Lacroix & Chen, 2018). Here Gifford, Lacroix and Chen outline how the dragons have evolved since Gifford's preliminary taxonomy. Specifically, how their study of food-choice intentions together with two other studies measuring psychological barriers' effect on individuals' intentions of engaging in pro-environmental behaviour form the basis of the revised and empirical validated *Dragons of Inaction Psychological Barriers instrument* (DIPB). And moreover how they, on the basis of their scientific progress, propose a new model of behavioural choice. I will attempt to illustrate how this scientific process takes the form of the *Ouroboros*, the dragon devouring its own tail. However presumptuous it may be to concludingly turn Gifford's own metaphor against himself, I will nonetheless make the claim that the development of the dragons of inaction appears to take the form of the dragon feeding off itself in order to sustain its own scientific legitimacy.

In order to fully understand the development of the dragons of inaction from their conception as a preliminary taxonomy to its current state, it is vital to remember that the main scientific purpose within environmental psychology is to develop behavioural models which can describe, explain, predict and change behaviour. The main challenge herein is to account for

the attitude-behaviour gap and penetrate the paradox of we want to act, we have the "capacity to act, but do not, or do much less than they could" (Gifford et al., 2018, p.163). Upon presenting their revised Dragons of Inaction Psychological Barriers instrument (DIPB) and a new model of behavioural choice Gifford, Lacroix and Chen write that:

> Psychological barriers might help enhance existing theories of proenvironmental behavior by providing an explanation for the value-action gap or the intention-behavior gap (…)The three studies described in this section are part of a continuous effort to improve understanding of (perceived) barriers and develop a useful structure and psychometrically sound measurement model (…) Constructing and validating sound psychological barrier scales also has practical value for designing policy and programs (p. 169-170).

The development Gifford et al. have made to the dragons of inaction since their conception can be seen as a movement from a taxonomy "proposed on an intuitive basis" to a theoretical model that is "valid in an empirical sense" (p. 169). Here, the study of food choice intentions is part of this process of validating the theory by firstly measuring the psychological barriers and secondly inferring latent barrier dimensions on the basis of their empirical findings following the principle of statistical analysis. This study, together with a study in energy conversation, formed the grounds for a third study, which investigated "proclimate behavior" across "six major climate-relevant domains" with the aim of establishing "a comprehensive but parsimonious measurement of psychological barriers to proenvironmental behaviour that could be used across multiple domains" (p. 171). Here six factors emerged from exploratory and confirmatory analysis, "with four items per factor". On the basis of these findings, they find empirical grounds to revise the seven dragons of inaction and reduce them to a total of six, in the process reframing the model as the (DIPB) instrument (p. 170-72).

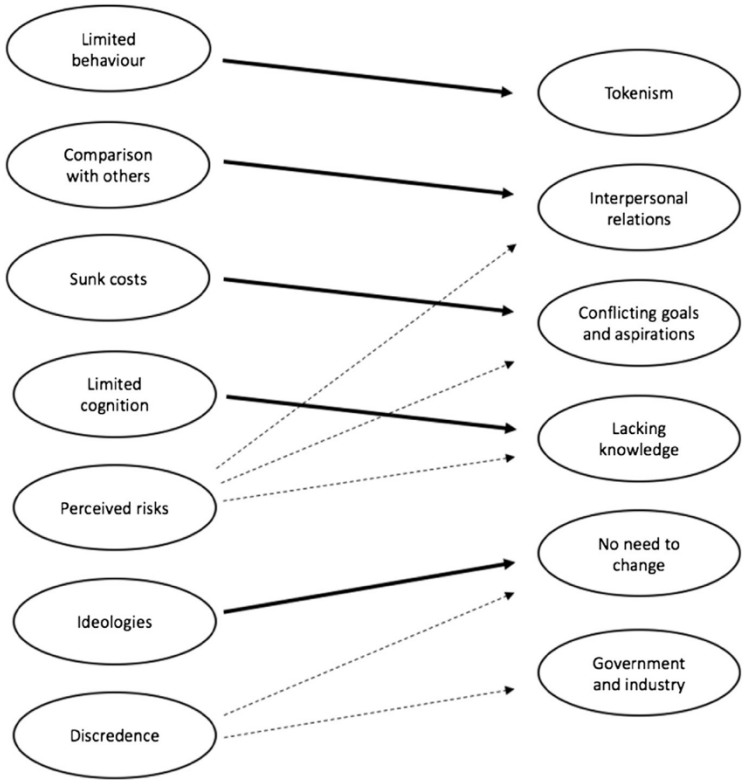


Figure 7.1 Gifford's (2011) seven barrier categories (left) in relation to the DIPB instrument (right). *DIPB*, Dragons of Inaction Psychological Barrier.

(Appendix 8)

This new revised dragon family of now six genera is no longer based on pure intuition, but instead a model empirically validated on the basis of studies designed around online surveys measuring *intended* behaviour and p*erceived* barriers by asking the participants to report their degree of agreement with prefabricated statements on a scale from "strongly disagree" to "strongly agree" (p. 171). In other words, the model whose very purpose is to describe, explain, and predict behaviour choice and psychological barriers' effect on these is de facto not based on actual behaviours in any real-life situation. Their proposed model is seemingly based on the theory of planned behaviour (TPB) precisely because it frames intentions as "the immediate antecedent of behavior". In order to make their new model "a superior predictor of behavioral choices" they have added the additional factors of desire, perceived psychological barriers, structural barriers, and reported behaviour (p. 177).

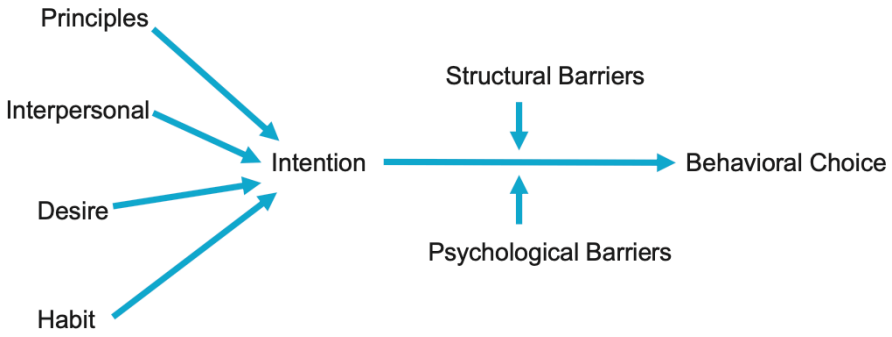


Figure 7.2 The theory of behavioral choice.

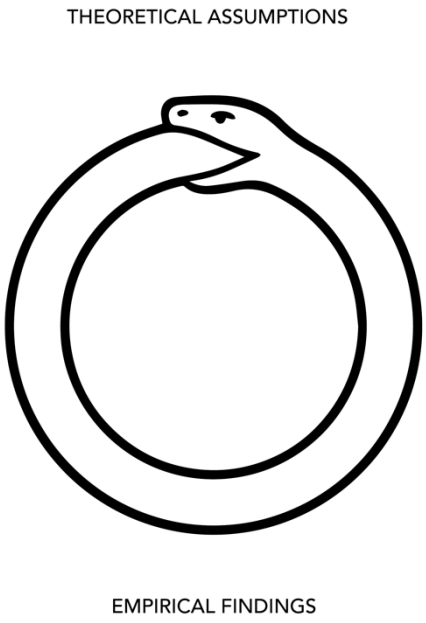
(Appendix 9)

If one recalls the model of the action-value gap[17] the model proposed by Gifford et al. appears to be a merging of Blake's model with TPB. While Blake construed concerns as informing pro-environmental behaviour, Gifford et al. take their basis in TPB to convey how intention is made up of several variables. Similarly, they try to account for TPD's limited ability to predict behaviour by demonstrating how barriers are intermediates between intention and behaviour. Hence, Gifford et al.'s proposed model stands as a virtuous example of developing new models of behavioural choice by improving "upon earlier models of behavior by increasing the range of influences while remaining reasonably parsimonious" (p. 179).

The proposed model can be considered Gifford's current *elucidation to the fabled gap* as it theoretically illustrates how individuals' intention to act pro-environmentally is hindered by either structural or perceived psychological barriers, as has been confirmed by empirical findings. However, model aside, how much insight has Gifford et al., since the initial conception, gained into the gap and the barriers presumably causing it? Not much, I would argue. In order to demonstrate how I consider their scientific development to be devoid of actual insight, I will begin by tracing the explanation underlining the characteristics of the current barriers. These can be located in the description of the six altered dragons pertaining to the DIPS instrument: No Need to Change, Conflicting Goals and Aspirations, Interpersonal Relations, Government and Industry, Tokenism, and Lacking Knowledge (p. 172). As illustrated in the above figure, the new taxonomy shares considerable resemblance with the initial seven dragons, with some only altered in name, while others are split and combined into

[17] See page 21

new categories. This resemblance is also evident in the outline of the new barrier dimensions, where the characteristics of each barrier dimension solely refer back Gifford's initial taxonomy (p. 173-174). Thus, the current assumptions pertaining to the characteristics of the psychological barriers still rely on Gifford's initial intuitive-based and, in my opinion, incoherent theoretical foundation. This raises the question of how they can be certain that these assumptions hold true. Here the evidence is supplied by the three studies that empirically confirm that psychological barriers lessen individuals' intention to take mitigative actions. However, as I have proposed in my investigation, it appears at the very least questionable to infer any insight into either individuals' behaviour or barriers' effect on behaviour on the basis of studies, where intentions and the, so to speak, existence of psychological barriers are measured in the participants' degree of agreement with prefabricated statements in an online survey. Gifford et al. are, as mentioned, aware that intention does not equal behaviour. But then how can they with sufficient certainty assume that the empirical findings adequately correlate with actual behaviour, in order to make the claim of explaining and prediction behaviour? Here they seem to find grounds in the theoretical assumptions related to the TBP. The model provides an abstraction of how *intention* is a reasonable measure of actual behaviour, which they then further strengthen by adding variables that comprise intention and integrating barriers as intermediates between intention and behaviour. However, the grounds for assuming that such an alteration makes the model a better predictor of behaviour must again be located in Gifford's initial theoretical foundations as their empirical findings only tell them that perceived barriers lessen reported intention. As such, the process of making the dragons of inaction scientifically valid, an explanator and predictor of human behaviour, is akin to the Ouroboros feeding on its own tail, with its circular loop of substantiating theoretical claims in empirical findings, whose validity is founded on the very same theoretical assumptions it attempts to confirm. It thus makes only sense to infer that the correlation between a participant's expression of agreement with two statements pertaining to one's intention and perceived barrier is indicative of the causal process leading up to a behaviour insofar that such causality is presupposed as a fact.



(Appendix 10)

As such, no new understandings are gained from the empirical studies, of which I consider the dominance of the denial factor indicative. They can only reconfirm that people who do not consider the problem to be a problem have no intention of taking action. And as they do not seem particularly interested in understanding why people are *in denial*, they resort to explaining it away by second-hand assumptions such as self-defence mechanisms. I would argue that the problem is rooted in the purpose of making nomological models that can predict behaviour. I would concurringly argue that Gifford and his colleagues are somewhat aware of the fact that they will never succeed with this, which I consider the notions of *intended behaviour* and *perceived barrier* to be indicative of. However, as the very scientific purpose is to make predictive models, they are held in a perpetual loop of preliminary states, placing the need for any conclusive claims at arm's length by alluding to future research. How "more research is needed to understand the impact of these dragons" in order "to enhance theory and fundamental knowledge" and to improve it is a means to "conduct behavior-specific investigations to establish barriers probalities for each behavior" (p. 174). I would argue that this circular search for more knowledge as it occurs within the movement between theory and empirical tests ultimately isolates their knowledge from engaging in any real-life situations pertaining to the challenges of global warming. And I believe this detached relationship to the subject matter permeates their approach to the application of knowledge via interventions.

As demonstrated by the now renamed DIPB instrument, the dragons of in action are no longer a fitting metaphor, but a "comprehensive and psychometrically sound instrument (the DIPB) for assessing the psychological barriers" (p. 178). While Gifford in conjunction with the initial taxonomy pointed to the DORITE model and how interventions could be developed to identify and overcome barriers, they now refer to the significantly less descriptive model of their own – a three-dimensional "Rubik's cube" model: Dragons x Behaviors x Persons. Here, they present "examples of strategies for addressing each of the six experimentally derived psychological barrier factors", with the crux being that if such insights are combined with knowledge on which "justifications" different demographics "employ (…) to excuse their actions for different behaviors" (p. 174), the more effective the intervention programmes will be. When Gifford initially pointed to the DORITE model as a potential framework for designing interventions he did so only on a superficial level. Since then, little further consideration appears to have been invested into how one might go from identifying a dragon to slaying it. Just as Gifford et al. seem comfortable with grounding their theory in decontextual research, they also appear content with alluding to how "Improved models of human decision-making will serve as a crucial platform for community leaders and members of the community to craft policies" (p. 179). The question is thus when their models will no longer be in the preliminary stage and in need of future research, but ready to be applied. And furthermore, the question is whether their instruments will ever be tested in relation to actual behaviour or if they leave it up to the programme designers to investigate the dragons at the very moment where they hinder pro-environmental behaviour.

Chapter Conclusion

Behind all things are reasons. Reasons can even explain the absurd.
The Log Lady, Twin Peaks

Gifford et al. write that "psychologists and allied social scientists are (or should be, as behaviour experts) at the forefront of climate change, as those best qualified to understand the choices and behavioural tendencies of the now 7.3 billion actors whose everyday choices either ameliorate or worsen the damage already done" (p. 161-62). Within environmental psychology it is hypothesised that our insufficiencies at ameliorating the consequences of global warming

are due to a gap between our attitudes and behaviour. As such, it is this gap that must be uncovered if we want to understand our "choices and behavioural tendencies". Just as the attitude-behaviour gap can be considered a psychological paradox, it appears seemingly paradoxical how the dragons of inaction have, since their conception, accumulated little to no additional knowledge on the characteristics of the psychological barriers considering how the initial taxonomy on a rudimentary level points to many reasonable explanations as to why we do not act in accordance with our concern for the environment. I have attempted to show how this lack of new insight is due to the relationship between theory and empirical research, where scientific progress fundamentally appears concerned with empirically testing existing assumptions. And how this ultimately circular relationship between theory and empirical findings is the product of the very purpose of scientific knowledge within environmental psychology – developing predictive models of behavioural choice. As such, Gifford's attempt to elucidate the attitude-behaviour gap becomes a matter of establishing a causal relationship in accordance to scientific principles, rather than an attempt to understand "the actors whose everyday choices either ameliorate or worsen the damage already done".

Before we lay the dragons of inaction to rest, I will concludingly highlight the implications I consider they entail as psychological perspectives on global warming. I will achieve this by revisiting the three perspectives I highlighted in the introduction to environmental psychology. While the dragons of inaction are expressive of the general approach within environmental psychology, I believe my initial remarks can be further sharpened on the basis of this investigation.

1. Global warming as caused by 7.3 billion consumers on aggregate

Environmental psychology's narrow view of individuals as consumers also permeates the notion of psychological barriers. The psychological barriers are only understood and investigated in relation to isolated instances of consumption and the 'psychological challenge' is construed as a matter of making individuals consume in a pro-environmental way. As a result, global warming is framed as the result of the aggerate consumption of 7.3 billion consumers, thus making everyone equally responsible and furthermore blindsiding other aspects of human life and how they impact the climate.

2. The challenges faced by individuals are only perceived ones

The attentive reader may have noticed that the initial dragon of *limited cognition* has evolved into the dragon of *lacking knowledge* in the DIPB instrument. This could lead one to think that Gifford and his associates as a whole had to abandon their assumption that our inaction was due to faulty cognitive processes and take a more lenient stance towards the individuals who "would like to change but report that they do not know how" (p. 174). However, this somewhat reproachful attitude that appeared to underline the notion of our limited cognition seems to have taken root in the general approach to psychological barriers, which they now refer to as *perceived* barriers. This notion of perceived, as something that may or may not exist, appears to have the unfortunate consequence of construing the barriers beyond structural as almost figments of the individuals' imagination. This change of discourse is evident when Gifford et al. state that "one can safely speculate that different individuals (age, culture, wealth, personality, motivation, etc.) will employ different justifications (dragons) to excuse their actions for different behaviors." (p. 174) Here the psychological barriers are no longer manifestations of lack of knowledge or limited cognition, but instead something individuals actively "employ" to "excuse" and "justify" their inaction, thus virtually insinuating that these individuals are actively acting with malignant intentions.

3. An instrumental approach detached from the problem itself

The scientific stance expressed in the notion of perceived psychological barriers appears to reflect a kind where the scientist, in this case the psychologist, has already attained all necessary insight into phenomenon and knows it is just a matter of applying this insight: Global warming is the consequence of 7.3 billion people's accumulated consumption and, as such, we just have to change their modes of consumption into pro-environmental ones. Psychology as a science seems only to provide the instruments needed for making the changes. However, considering that such instruments themselves are based on decontextual research approaches, one could question if Gifford and the field of environmental psychology are in fact standing "at the forefront of climate change" (p. 162).

CHAPTER 4: IN SEARCH OF A DIFFERENT APPROACH

In this concluding chapter I will discuss how a social practice approach might be an alternative to the individualising approach within environmental psychology. A way to move from thinking of people *with problems* and instead approach the challenges that we are facing as a matter of people *being in trouble*. The discussion of this approach will revolve around Matthew Adams' exploration of a social practice approach in relation to the ecological crisis presented in his book '*Ecological crisis, Sustainability and the Psychosocial Subject – beyond behaviour change*' (2016). In order to challenge Adams, I will discuss his contribution in relation to a critical psychological approach to social practice, where I will return to the perspectives outlined in chapter 1 as well as some of the few existing contributions to the subject of global warming from a critical psychological standpoint. I will discuss the potentials of a social practice in relation to three aspects; *Social practice as an alternative point of analysis, global warming as in entangled and mediated in social practices,* and lastly *change of social practice as means of addressing environmental issues*. These aspects are in nature tentative and loosely constructed and more closely serve the purpose of hinting at the limitations and possibilities of a social practice approach, rather than a clear-cut evaluation.

Social Practice as a Basis Point of Analysis

Adams seeks to go *beyond behaviour change*. Instead of approaching change as making individuals act sustainably, he asks to "the sustainable development of what?". Adams wants to fundamentally break with the individual as the object of change and instead consider *social practices* the "'basic unit' of enquiry, when we try to account for change"[18] (Adams, 2016, p. 68).

[18]Adams' starting point is a critique of how mainstream psychology frames the psychological dimensions of the ecological crisis as a matter of individual behaviour change, where he finds six general problems related to this approach: depoliticising the ecological crisis, ignoring the power of conflicting interest, reifying citizens as passive subjects, fixing behaviour in stasis, and neglecting the importance of social context (Adams, 2016, p. 47-50). Adams furthermore problematises how the ecological crisis is embedded in dominant scientific framing, and how this framing while being valuable is reductive in its representation of the problems which we are facing. Adams argues that this scientific narrative ultimately frames an inherently social problem into a physical one, which has the consequence of leaving out how global warming is intrinsically linked to our everyday life (p. 25-30).

Adams stresses how social practices must not be considered "an *outcome* of social forces" or "individuals' variables", but must be considered "doubly generative: they establish the particular possibilities for individual actions, but at the same time 'social life comes into being through practices'" (p. 69). Citing Andreas Reckwitz, Adams defines how social practice is a pattern "made up of a number of actions", where the individual is not the "organizing *force*", "but rather the vehicle for these patterns". In our conduct in life, we are "'recruited' to social practices" and by embodying them we reproduce them. The patterns of action are not located within the singular individuals, "but in 'elements and qualities' that make a practice recognizable as a practice". Drawing on the work of Elisabeth Shove's attempt to frame sustainable development from the point of social practice, Adams points to how practices can be seen as being constituted by three elements: "materials, competence and meanings" (p. 71). Social practices are not be seen as isolated entities, but rather as interdependent on each other, which, according to Adams, "creates a significant degree of 'path dependence' in everyday life". This path dependence is also an expression of how we only are able to engage in a finite number of practices in our conduct of everyday life and of how these are reinforced by "dominant projects" – "'complexes of practice that orient the ways in which people spend their time and the priorities around which their lives are organized'" (Shove in Adams, 2016, p. 72). In relation to the change of practices Adams states how personal agency is usually framed as an "elusive phenomenon", due to how change is understood as something which is occurring in the dynamics between practices, rather than due to the actions of the persons within the practices (p. 74). Adams critiques how this understanding of social practices as relatively stable entities does not adequately reflect how "the reality of anthropogenic climate change is a 'relative, situated and emergent' meaning par excellence". Consequently, he highlights how the aspects of *meaning, power* and *nature* are underdeveloped in current social practice approaches to environmental issues. In relation to the latter Adams remarks how, when we are recruited into practice, we do not blindly partake in its reproduction, but rather engage in negotiation of meaning. Adams considers meaning to be a central driving force of practices and considers the negotiation of meaning as a "dynamic of subjective and intersubjective deliberations" expressive of human experiences of emotional attachment, individual biographies and ontological insecurities. Adams questions if such dimensions of human experiences can adequately be grasped by the concept of social practices alone or whether "we can miss the fact that our lives take place as and through many states, only some of which can comfortably fit this grammar and category of action and doing" (Harrison in Adams, 2016, p. 102).

If we compare Adams' approach to social practice with the approaches made within critical psychology, the approaches to social practice as an analytical concept appear to share rudimentary notions, although some differences also appear to exist. By drawing on the concept of social practices as developed by Ole Dreier, I will here briefly highlight the demarcating lines to Adams' approach. In stark contrast to the above quote, Dreier emphasises how "in order to study persons as living creatures, we must study them in action (…) or action". And since our activity is "embodied and therefore always situated in particular situations" we always participate in social practice – "it is the fabric that connects us" (Dreier, 2008, p. 22 & 28). The notion of "persons as participants" marks a clear distinction between human beings as recruited by practices, as "uniform members", where the action of one could be exchanged by another without altering the practice. In contrast to this, Dreier argues how we must consider our participation as being "in a partial *and* particular way". While we participate in shared practices with shared goals, we do so on the basis of personal reasons and with different *scopes of possibilities* (p. 30). Dreier considers human activity (as social practice) to be "the dynamic middle in which the subject and social world are connected." However, the notion of participation entails a more dynamic approach to the re-reproduction and change of practices, as our participations are not merely an embodiment of preconfigured patterns of action. The conditions of a given practice are not given as objective conditions, but rather as premises for reasons for action. Thus, when we are to grasp the personal dimension of our participation in social practice, we must approach it from the "first-person perspective on the social context in which that person is located and her actions, thoughts, and emotions in it" (p. 28).

Adams takes on a different approach when he seeks understand the effective responses to the ecological crisis. In the analysis brought forward in his book, he demonstrates how culturally developed narratives act as "defence mechanisms" against our own *ontological security* and *mortality salience* – expressive of a collective act of denying how the ecological crisis induces a state "where one 'cannot take the realness, aliveness, autonomy and identity of [one]self and others for granted'" and how its forewarned future impacts increase "our 'death thought accessibility'; it reminds us, simply put, of our own mortality." (p. 111 & 116). While Adams' use of the concepts is much more nuanced than has been presented here, he fundamentally appears to construe a notion of the subject and the society as driven by unconscious forces of *denial,* which must subsequently be uncovered and unravelled from a third-person perspective. Adams' social practice approach might help us to think of *people in trouble*, however there is a risk that the logic remains the same when barriers are exchanged with "master narratives" (p. 183), i.e. turning psychological barriers into social ones. And while

Adams stresses how collective forms of defence mechanisms must not be added to the list of psychological barriers, they are neither "internal" or "internal", he still portrays them as psychological dynamics outside the person's 'conscious' reasons for action – as manifestations of disavowed experiences, which are repressed or "projected onto other, but reappear in related forms" (p. 166-67). Seen from a critical psychology standpoint, such explanations do not appear to allow us to understand how global warming becomes subjective aspects of our participation in social practices.

A Mediated/Entangled Phenomenon

In chapter 1, I alluded to how global warming as a phenomenon could be understood as both *conditioning* and *conditioned by* the societal conditions. In this part I will attempt to expand the notion of double-sided properties, by approaching global warming as not only a *mediated*, but also an *entangled* phenomenon.

While social practice theories to various degrees have embraced how objects, things, technologies, etc., affect and mediate human activity, these approaches are often restricted to include humans and human-made objects as constitutes of social practice, leaving out other species and *non-human entities*. The concept of *entanglement* is an attempt to bring such aspects into our analytical focus. Entanglement is a concept from quantum physics borrowed by social science in order to capture the enmeshment of existence – how humans, other lifeforms, objects, and physical phenomena are spun into an interdependent web of life. While some keep and foreground the quantum properties of space-time, causality, and quantum states, I will here approach the concept from Adams' definition as "our (…) relationship with more-than-human-nature" (p. 209), a relationship he states theories of sustainable social practice "ironically (…) has almost nothing to say about", resulting in a depiction of the environment as something external outside our *social practice*, which we affect by our "'resource intensive'" practices (p. 98). Entanglement is, as such, a way to escape this detached anthropocentric view on more-than-human entities and instead embrace "the interdependence of life". Adams argues that to fully grasp our entanglement we need to re-establish our connections with other lifeforms, which he demonstrates with "human-nonhuman *animal* interaction". While Adams, through examples of humans' entangled relationships with 'tanagers' and 'ravens', sympathetically calls for an understanding 'of how ethically bound the human is to other forms of life, bound in our shared vulnerability, to other living beings who think and feel'(Wolfe in

Adams, 2016, p. 226), I think this approach to entanglement is too immediate. It is too fixated on establishing compassion with the tanager as it comes into our binoculars' focus, when perhaps the real challenge of entanglement is to commit ourselves to our independence to entities, we are careless to, just as they have no care for us, such as the entities that make up global warming:

> This beast includes the sun, since it's infrared heat from the sun that is trapped by the greenhouse effect of gases such as CO2. So global warming is a colossal entity that includes entities that exist way beyond Earth's atmosphere, and yet it affects us intimately, right here and now. Global warming covers the entire surface of Earth, and 75 percent of it extends five hundred years into the future (Morton, 2013, p. 103).

What Timothy Morton here refers to is global warming as a *hyperobject* – an object hyper-expanded in space and time relative to our human experience of it. And while Morton's project is to convey the unfathomable properties of global warming, I think he equally manages to capture aspects of our immediate experience of it. Approaching interdependence from Morton's perspective, it is not so much about achieving a sense of belonging with hyperobjects, as it is a matter of coming to terms with how our situated experience of global warming does not begin to grasp the object in itself. Morton thinks this leaves us with an "uncanny familiarity", it is the weather/it is not the weather, in our everyday life:

> You are walking out of the supermarket. As you approach your car, a stranger calls out, "Hey! Funny weather today!" With a due sense of caution—is she a global warming denier or not? — you reply yes. There is a slight hesitation. Is it because she is thinking of saying something about global warming? In any case, the hesitation induced you to think of it. Congratulations: you are living proof that you have entered the time of hyperobjects (p. 99).

One could read the situation as being indicative of how global warming is socially mediated. It becomes an aspect of our social life as the conversation is initiated. However, Morton would argue that global warming, *the funny weather*, imposed this exchange of words. If we attempt to read the situation as occurring in a social practice, we can identify aspects such as humans, human activity, supermarkets, cars, and funny weather. Furthermore, we could analyse how it is interlocked into and dependent on a *structure of social practices* (Dreier, 2008), which supplies the supermarket with food and makes the manufacturing of the car possible. But we could also consider the situation to be entangled in infrared heat, CO_2 and whatever else makes up the funny weather. As such, it is also entangled in past emissions of the greenhouse gases

that now trap the heat in the atmosphere. And if we consider the funny weather not to be the *revenge of Nature*, but rather the "result of actions in the past" (Malm, 2018, p. 5), we can begin to see how our entanglement with global warming folds back into its mediated appearance in this particular conversation on the parking lot outside a supermarket. This everyday situation is made possible by an "ever-increasing complexity of the division of labour" (Uzzel & Räthzel, 2019, p. 1398). Specifically, it relates to a complex global value chain of social practices which makes the cars and supermarkets possible, but also conditions the continuation of the actions which make up global warming. As such, global warming seemingly reaches into the past as well as the future, almost like a ghost haunting us for past malevolence and will continue to do so until it has been resolved.

Mediation and entanglement may not be perfectly adequate terms of conveying the double-sidedness of the phenomenon. And while global warming as a phenomenon might always be considered mediated, I consider it necessary to explore how global warming is not exhausted in its mediatedness. Not only does it become an aspect of our everyday life through our representations of it, but also because of how its 'manifestations' affect our social life. Just as the concept of mediation is crucial to grasp how we neither live in a container called society nor act in isolated social practices, concepts such as entanglement might be crucial to analytically grasp how global warming's *hyper* properties become conditions for our actions in relation to the phenomenon in contradictory ways in different social practices.

Changing Social Practice

In this concluding part I will discuss how global warming can be addressed by changing social practice. To begin, I will discuss Matthew Adams' approach to change as a matter of challenging *foregone narrative* and see this approach in relation to a critical psychological approach to change of social practices proposed by Nora Räthzel and David Uzzel.

Slavoj Zizek's notion of how 'it is easier to imagine the end of the world than the of capitalism' is by now a stable framing of the malaise we seem to find ourselves in, when attempting to unravel the "modes of production" causing the ecological crisis (Adams, 2016, p. 235). Adams seems to take quite a literary starting point in Zizek's imagery, when he concludingly points to how we may be able to address the crisis by changing our social practices through *narratives*. Adams' conviction is that by confronting and rewriting the denial-driven narratives pushing us

towards unsustainable consumption, we can begin to face the reality of the ecological crisis and bring about change. Narrative foreclosure refers to the "unshakable conviction that it is simply too late to live meaningfully" (Freeman in Adams, 2016, p. 241), and Adams thinks we find ourselves in a culturally induced kind of foreclosure. While the concept is developed in relation to personal narratives and mental health, Adams considers the concept to capture "the impasse of existing narrative framings of climate change and sustainable development" (p. 238). Just as foreclosed personal narratives restrict how one might conceive a future life with a chronic disease, Adams sees "how predominant cultural narratives (endless growth, neo-liberalism, consumerism, frontierism) (…) can be understood as elements of a collective experience of narrative foreclosure" (p. 241-42), hindering us from meaningfully engaging in the crisis. However, by a "widening of available narrative resources", Adams sees the opportunity for "socially generated narratives", which he considers central to "the building of 'adaptive capacity' in the context of anthropogenic ecological degradation" (p. 246).

I find Adams' analysis of how narratives frame our understanding of the ecological crisis to be a valuable insight. And while it also resonates with the notion that 'it matters what ideas we think ideas with', Adams decides on an approach to change of social practice, which I ultimately think detaches the drivers of change from the practices that ought to be changed. While Adams considers narration a human activity on equal terms with actions, it is difficult to pinpoint how our communal narration is to be translated into action. When reading his approach to change, one almost gets the sense of a therapeutic room a practice enters and the outcome of this session "determines how it understands and practices future adaptation" (p. 245). Without establishing any connection to narratives and the adaptive practices, Adams' research agenda almost becomes akin to the theory of planned behaviour where intention equals behaviour. It remains unclear how such changes are brought about in a social practice that is just as interwoven in the capitalistic mode of production as when its 'practitioners' stepped into the therapeutic room.

Imagine for a minute that you are a company owner. You and your associates have just gone through a revelatory workshop of coming to terms with your unstainable mode of conducting business, collectively deciding to turn the page and start doing things differently. As the session went on for some time, you go straight to the restroom and, as you flush, imagining how "the U-bend takes the waste away into some ontologically alien realm" (Morton, 2013, p. 115), you are immediately struck by your independence of the societal conditions, i.e. your independence of the "alienating and simultaneously emancipating distance from vital daily necessities" (Chimirri & Shraube, 2019, p. 54). One could argue that, while in the process of developing a

business into a sustainable one, one should be able to use the toilet. However, the same problem occurs the moment you begin the green transition of the company, as this transition is independent of the structure of social practice of which you are a part, functioning on specific historical conditions where the production of commodity is the production of profit. It is difficult to imagine how a social practice could narratively construct a way out of these conditions for change.

Räthzel and Uzzel attempt to take these concrete historical conditions into account when they present how changes can be seen through the lens of the critical psychological concept of *societal action competence*. As an attempt to bring Holzkamp's notion of the human "capability to collectively change the conditions of one's existence and thereby change oneself and develop individual capabilities to act cooperatively" (Räthzel & Uzzel, 2019, 1401), into the present-day ecological crisis, they take their departure in the mediated nature of our *societal nature*, emphasising how the attempt to gain control over shared conditions must be seen in relation to how actions in local practices are interdependent on a complex structure of social practices interwoven in power relations restricting such attempts. Here they challenge the conception that globalisation hinders our ability to gain control over common "resources" and point to how communities must not be conceived as only spatial. How occupational communities of workers in transnational corporations could be part of the "social revolution" by "demanding control of the ways in which resources are used by the corporation" and here make an "impact on the corporation's practices" (p. 1406). While they stress how a social revolution in the light of environmental issues, must not be seen "as the storming of the Winter Palace", sentences such as "how psychologists could align themselves with environmentally conscious workers' movements" and "without workers, combating climate change will be impossible" almost transform the ecological crisis into a class struggle. Regardless of whether this is their intention, I do think they go against their own use of critical psychological concepts as "heuristics" to analyse "problems, conflicts and contradictions that people experience within today's societal relations" (p. 1400) when they construe the collective control over conditions as environmentally conscious workers versus antagonistic corporations. I would argue that intersubjective conflicts are left out when the solution to ecological crisis is conceived as a contradictory-free overtaking of the means of production.

To reiterate, participants of social practice are not *uniform workers*, but participants with particular personal stances and concerns which both relate to their participation in the given practice as well as their conduct of everyday life. Holzkamp's intention with the concept of

foreshortened reason constellation, was to convey how (common) social problems become intersubjective conflicts, how conflicts arise when, seen through the lens of social practices, one fails to take into account how "participants who have diverse positions in a shared context therefore also have diverse possibilities, concerns, and stakes in it" (Dreier, 2008, p. 36). The environmentally conscious workers might share a generalised direction of how they wish to change practice, but may also hold different ideas as to how to bring such changes about, as well as differences in relation to the consequences such changes might entail for them in relation to their personal life interest, such as the need to provide for one's family. How everyday life is entangled in global warming is not merely about the aggregate emission of greenhouse gases from our daily activities, but how it is woven into the conditions and the necessities for sustaining one's life. If we are to unravel this from a psychological perspective, we need grasp how this is mediated from the standpoint of the subject in relation to participation in social practices as a means of conducting our lives. An increase of the control to change the conditions must be considered in relation to the conduct of everyday. And perhaps if we begin our analytical inquiry from this starting point, we may be able to trace the interconnected conditions as they are conceived from a first-person perspective. Perhaps then we can begin to outline how such conditions are interconnected in contradictory ways and where within the space between everyday necessities and potentialities openings exist to rearrange such connections.

CONCLUSION: 'STAYING WITH THE TROUBLE'

If a cabal of evil psychologists had gathered in a secret undersea base to concoct a crisis humanity would be hopelessly ill-equipped to address, they couldn't have done better than climate change.

Oliver Burkeman, The Guardian

This thesis has been an exploration of how psychological perspectives not only can help us comprehend a crisis of our own making, but also inform us of how we should face the challenges it entails. The above quote strikingly resembles the dominant psychological framing of global warming. Not only have we humans caused the problem through excessive consumption, but also now find ourselves struggling to comprehend and let alone address it. Thus, it is psychology's role, as the science of human behaviour, to uncover the barriers preventing us from taking action and instrumentalise this knowledge into interventions with the purpose of making individuals despite their intrinsic deficiencies behave pro-environmentally. The mainstream psychological project in relation to global warming can be considered a rationalistic one. If the evil psychologists hide in the undersea base, then the good ones are up in an ivory tower, from where they have a clear view of how to stop global warming. Hence, it is only a matter of making individuals behave accordingly. However, considering how these perspectives, as they are rooted in abstract behavioural models and decontextual research findings, appear so far removed from the problem they seek to address, it can be questioned what they fundamentally provide of understandings and means of action. In the closing, I have explored a social practice approach as a way to start thinking of *people in trouble* instead of *people with problems*. And while social practice as an analytical starting point may allow us to link global warming with the manifolds of human activity, it is not necessarily the road to Damascus as there is the risk of developing understandings and solutions, which again detach us from the problem matter. Unravelling the narratives that frames what we deem valuable in life is an important step, but if do not connect this to what we find value-able in practice, such reflections merely become pockets of air in the rising sea. Just as we need to approach the concrete historical arrangements of life and things on earth as

they are mediated in particular ways from the standpoint of the subject, if we are to grasp how they become (problematic) aspects of social practice.

So, where does this leave us? First step would be to stop bemoaning our lack of omnipotence and instead ‘stay with the trouble’ as Donna Haraway puts it (Haraway 2016). Commit psychological perspectives to approach global warming from our situated experience of it. The troubles we are in, may very well be because of our situatedness and the difficulty of not only exhaustively grasping the phenomenon, but moreover its entanglement in our local practices as they are interconnected into a global network. However, when we detach ourselves from the concrete troubles in the attempt to explain them, we also miss the opportunity of exploring how this entanglement is a lived experience, mediated in particular ways from the person’s first-person perspective. If we consider global warming as not solely a matter of reducing the emission of greenhouse gases, but as an intersubjective problem of connecting partial perspectives and particular concerns in an interconnected world in relation to a phenomenon, which forces us to think the here and now with there and then, a starting point would be to establish these connections as they are linked to our situatedness in social practices as concrete conditions for rearranging our co-existence.

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RESUMÉ

Specialet er en udforskning af psykologiske perspektiver på global opvarmning. I hvorledes psykologisker perspektiver ikke alene bidrager med indsigt i fænomenet, men antagelsesvis også har betydninger for, hvordan vi handler på fænomenet. Specialet tager afsæt i et forsøg på at tænke global opvarmning med kritisk psykologi og fra subjektets standpunkt. Her peges der på et mulig afsæt i hvorledes global opvarmning, som medieret fænomen, er *betingende for* og *betinget af* den fælles reproduktion af sociale betingelser. Hernæst følger en undersøgelse af Robert Giffords teori om psykologiske barriere *'The Dragons of Inaction'*. Med kritiske nedslag i det teoretiske fundament samt empiriske grundlag, påpeges de cirkulære bevægelser mellem teori og empiri i udviklingen fra præliminær taksonomi til videnskabelig adfærdsmodel, hvilket forekommer at frakoble den videnskabelig produktion af viden, fra de problemer der forsøges forklaret og løst. Afslutningsvis diskuteres det hvorvidt en praksis-orienteret tilgang kan føre til indsigt i de problemer, vi befinder os i og samtidig være afsæt for at handle på global opvarmning via forandring fra og igennem praksis.

APPENDIXES

APPENDIX 1

Figure of theory of planned behavior from *Attitudes and Behavior - International Encyclopedia of the Social & Behavioral Sciences*

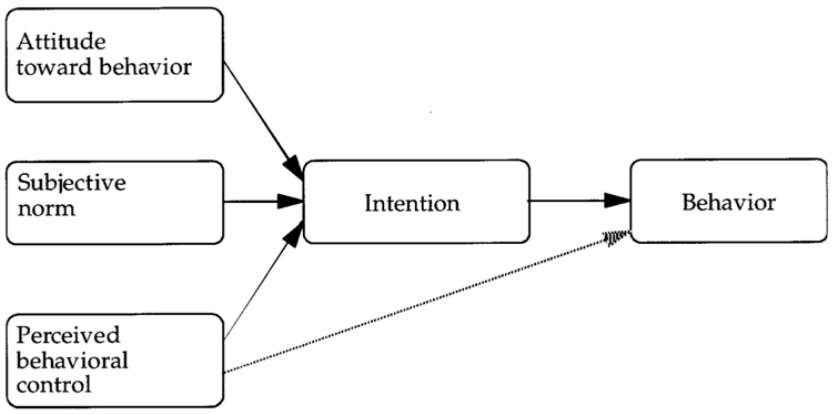

Figure 2
Theory of planned behavior (after Ajzen 1991)

APPENDIX 2

Figure of Barriers between environmental concern and action (Kollmuss, A., & Agyeman, J. 2002)

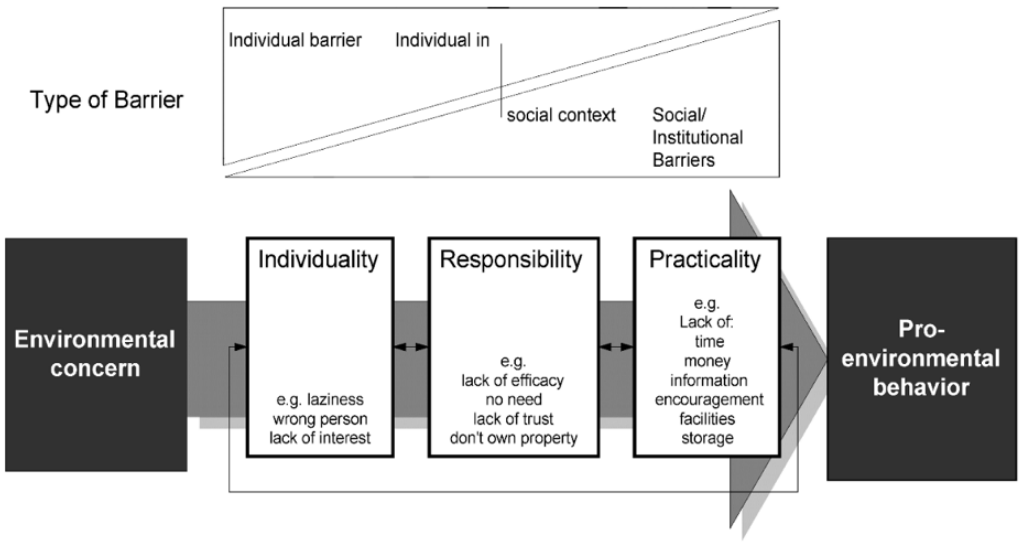

FIG. 5. Barriers between environmental concern and action (Blake, 1999).

APPENDIX 3

Table of the dragons of Inaction as of 2011 (Gifford, R., Lacriox, K., Chen, A 2018)

Table 7.1 The dragons of inaction as of 2011

Limited cognition	Ideologies	Comparisons with others	Sunk costs	Discredence	Perceived risks	Limited behavior
Ancient brain	Worldviews	Social comparison	Financial investments	Mistrust	Functional	Tokenism
Ignorance	Suprahuman powers	Social norms and networks	Behavioral momentum	Perceived program inadequacy	Physical	Rebound effect
Environmental numbness	Technosalvation	Perceived inequity	Conflicting values, goals, and aspirations	Denial	Financial	
Uncertainty	System justification		Place attachment[a]	Reactance	Social	
Judgmental discounting					Psychological	
Optimism bias					Temporal	
Perceived behavioral control/self-efficacy						

APPENDIX 4

Table of Means, standard deviations, and pearson correlations of barrier items with mitigative food choice intentions (Gifford & Chen 2017)

Table 1 Means, standard deviations, and pearson correlations of barrier items with mitigative food choice intentions

	Barrier items	*M*	*SD*	*r*	95 % CI
1.	There's no need to make these changes because I'm not convinced that a serious environmental problem even exists.	2.06	1.13	–.42**	[-0.5, -0.3]
2.	The pro-environmental behaviours that I currently engage in make further changes unnecessary.	2.54	1.03	–.074	[-0.2, 0.1]
3.	I just tune out when it comes to hearing about climate change or thinking about what sort of changes I could make in my own life.	2.09	1.05	–.44**	[-0.5, -0.3]
4.	There's so much information out there that I've stopped paying attention to all of the possible changes that I should make, including these.	2.46	1.11	–.34**	[-0.4, -0.2]
5.	I'm content with the extent to which my current choices reflect who I am as a person.	3.39	1.04	–.15*	[-0.3, 0.0]
6.	Environmental problems are more serious in other places, and so I don't need to change.	2.06	1.04	–.40**	[-0.5, -0.3]
7.	I can't change because I'm invested in my current lifestyle.	3.25	2.17	–.05	[-0.2, 0.1]
8.	Making these changes would be criticized by those around me.	2.98	2.25	.01	[-0.1, 0.1]
9.	There's not much point in me making changes like these because I feel confident in the ability of technological innovators to help solve climate change.	3.07	2.15	–.15*	[-0.3, 0.0]
10.	There is no pressing need to change because the natural cycles of the earth are beyond our control.	3.12	2.05	–.05	[-0.2, 0.1]
11.	If I made the necessary changes, I probably would be embarrassed when others noticed what I was doing.	2.86	2.25	–.10	[-0.2, 0.0]
12.	I'm too busy to think about making these changes right now.	3.12	2.15	–.10	[-0.2, 0.0]
13.	I'm worried that others will criticize me for making these changes.	1.54	.86	–.17*	[-0.3, 0.0]
14.	It's too difficult for me to make these changes.	2.25	1.08	–.26**	[-0.4, -0.1]
15.	I haven't paid much attention to this issue.	2.31	1.10	–.46**	[-0.6, -0.4]
16.	I haven't done this mainly because changing involves some risk.	1.90	.90	–.15*	[-0.3, 0.0]
17.	My environmental actions already make enough of a difference.	2.54	1.00	–.16*	[-0.3, 0.0]
18.	I've put a lot of time and effort into my current lifestyle, and so I don't want to change.	2.10	1.02	–.36**	[-0.5, -0.2]
19.	I don't think changing this will have much impact around here.	2.43	1.18	–.48**	[-0.6, -0.4]
20.	Even if most people made these changes it wouldn't help enough.	2.34	1.18	–.41**	[-0.5, -0.3]
21.	Society as it is now is working fine for me, and I'm worried that changes like these might somehow compromise that.	1.96	1.00	–.29**	[-0.4, -0.2]
22.	I have spent quite a bit of money on my current choices, so I would lose too much if I changed now.	1.97	.98	–.28**	[-0.4, -0.2]
23.	I'm satisfied with my current way of doing things.	3.09	1.12	–.37**	[-0.5, -0.3]

Table 1 (continued)

	Barrier items	*M*	*SD*	*r*	95 % CI
24.	I'm confident that things will get better with time, and so I don't see much point in making these changes.	2.08	1.06	–.46**	[-0.6, -0.4]
25.	I'm concerned that these changes will take up too much of my time.	2.20	1.13	–.22**	[-0.3, -0.1]
26.	When I have taken some step to help the environment, I think it is a good idea to reward myself.	2.56	1.12	.10	[0.0, 0.2]
27.	There's no need to change because the current "environmental crisis" has been exaggerated.	2.02	1.14	–.41**	[-0.5, -0.3]
28.	I'm unsure that these changes would be an improvement over my current choices.	2.59	1.15	–.42**	[-0.5, -0.3]
29.	Even if I decided to make these changes, there would be too many other obstacles to overcome.	2.45	1.07	–.32**	[-0.4, -0.2]
30.	I haven't heard convincing arguments for why I should make these changes.	2.42	1.25	–.52**	[-0.6, -0.4]
31.	Honestly, I don't think that the "problem" that this would solve is actually a problem.	2.14	1.20	–.40**	[-0.5, -0.3]
32.	The fate of the human race is out of our hands, so there is no reason for me to change.	1.98	1.06	–.32**	[-0.4, -0.2]
33.	I wouldn't consider making these changes because they are inconsistent with my political views.	1.73	.95	–.25**	[-0.4, -0.1]
34.	Making these changes is hard because they might compromise my safety.	1.83	.98	–.23**	[-0.4, -0.1]
35.	Humankind cannot make a difference when it comes to saving the earth, so there is no point for me to change.	1.76	.96	–.34**	[-0.4, -0.2]
36.	Only fake experts promote these changes.	1.81	1.00	–.35**	[-0.5, -0.2]

36-item 5-point scale ($\alpha = .93$), from 1 = Strongly disagree to 5 = Strongly agree; *$p < .05$, **$p < .01$

APPENDIX 5

Table of Factor loadings for the 4 barrier dimensions (Gifford & Chen 2017)

Table 2 Factor loadings for the 4 barrier dimensions ($N = 251$)

Items		F^1	F^2	F^3	F^4
35.	Humankind cannot make a difference when it comes to saving the earth, so there is no point for me to change.	.82	.27	.14	.12
27.	There's no need to change because the current "environmental crisis" has been exaggerate	.70	.11	.46	.17
31.	Honestly, I don't think that the "problem" that this would solve is actually a problem.	.72	.25	.46	.21
36.	Only fake experts promote these changes.	.70	.28	.34	.17
1.	There's no need to make these changes because I'm not convinced that a serious environmental problem even exists.	.66	.12	.48	.20
11.	If I made the necessary changes, I probably would be embarrassed when others noticed what I was doing.	.25	.13	.00	.80
8.	Making these changes would be criticized by those around me.	.08	.19	.05	**.77**
14.	It's too difficult for me to make these changes.	.09	.74	.15	.17
29.	Even if I decided to make these changes, there would be too many other obstacles to overcome.	.30	.69	.24	.21
16.	I haven't done this mainly because changing involves some risk.	.33	.66	.04	.36
25.	I'm concerned that these changes will take up too much of my time.	.36	.66	.07	.24
22.	I have spent quite a bit of money on my current choices, so I would lose too much if I changed now.	.34	.63	.13	.21
5.	I'm content with the extent to which my current choices reflect who I am as a person.	.06	.02	.78	.02
23.	I'm satisfied with my current way of doing things.	.30	.21	.67	.03
17.	My environmental actions already make enough of a difference.	.13	.34	.55	.03
28.	I'm unsure that these changes would be an improvement over my current choices.*	.50	.38	.47	.20
2.	The pro-environmental behaviours that I currently engage in make further changes unnecessary.*	.28	.03	.45	.07
	M (*SD*)	2.01 (0.-97)	2.20 (0.-83)	2.89 (0.-75)	2.92 (1.-94)

Note. Factor labels: F^1 = Denial F^2 = Conflicting Goals F^3 = Tokenism F^4 = Interpersonal * added to increase construct validity

APPENDIX 6

Competing measurement models of psychological barrier (Gifford & Chen 2017)

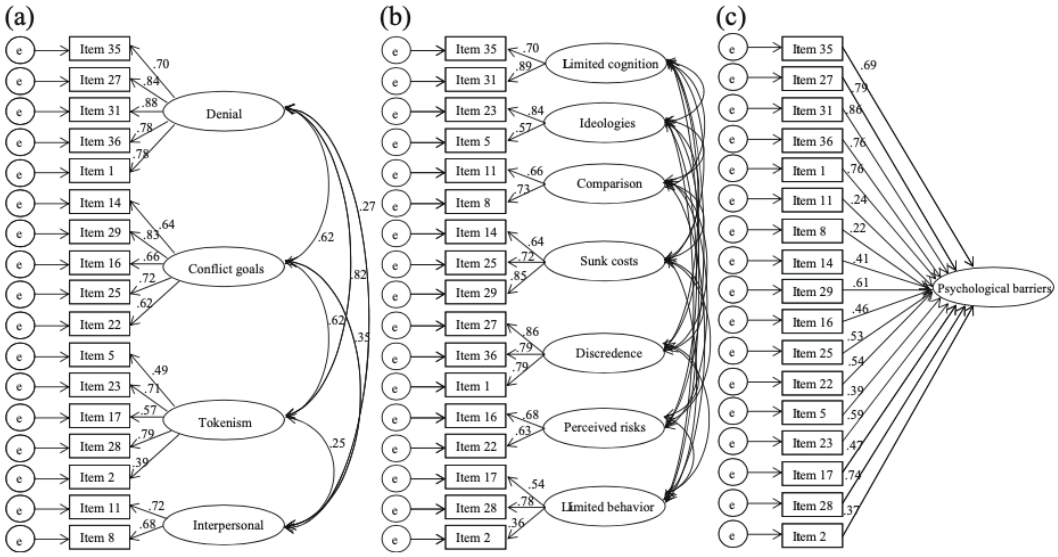

Fig. 1 Competing measurement models of psychological barrier. The path diagrams of three competing models of psychological barrier to mitigative food choice intentions (MFCI). (**a**) four component. (**b**) seven component. (**c**) one component

APPENDIX 7

Table of standard multiple regression of barrier factors for the two models predicting Mitigative Food Choice Intentions (MFCI) (N = 251) (Gifford & Chen 2017)

Table 4 Standard multiple regression of barrier factors for the two models predicting Mitigative Food Choice Intentions (MFCI) ($N = 251$)

	Predictors	Items	α	Pearson *r*	β	*b*	*SE b*
Model 1	Denial	5	.89	–.48***	–.34***	–.42	.10
	Conflicting goals	5	.82	–.36***	–.17*	–.24	.10
	Tokenism	5	.74	–.39***	–.11	–.16	.12
	Interpersonal	2	.66	–.07			
Model 2	Limited cognition	2	.75	–.42***	–.04	–.05	.12
	Ideologies	2	.65	–.36***	–.16*	–.20	.09
	Sunk costs	3	.78	–.35***	–.15*	–.19	.10
	Discredence	3	.85	–.48***	–.31**	–.36	.12
	Perceived risks	2	.60	–.30***	–.05	–.08	.11
	Limited behavior	3	.59	–.33***	.04	.06	.12
	Comparison	2	.66	–.16			

Note. For Model 1, $R^2 = .26$, Adj. $R^2 = .25$; For Model 2, $R^2 = .28$, Adj. $R^2 = .26$; Interpersonal and Comparison were removed from the analyses; $^{**}p < .001$,$^{**}p < .01$ $^{*}p < .05$

APPENDIX 8

Figure of Gifford's (2011) seven barrier categories (left) in relation to the DIPB instrument (right). DIPB, Dragons of Inaction Psychological Barrier (Gifford et al., 2018)

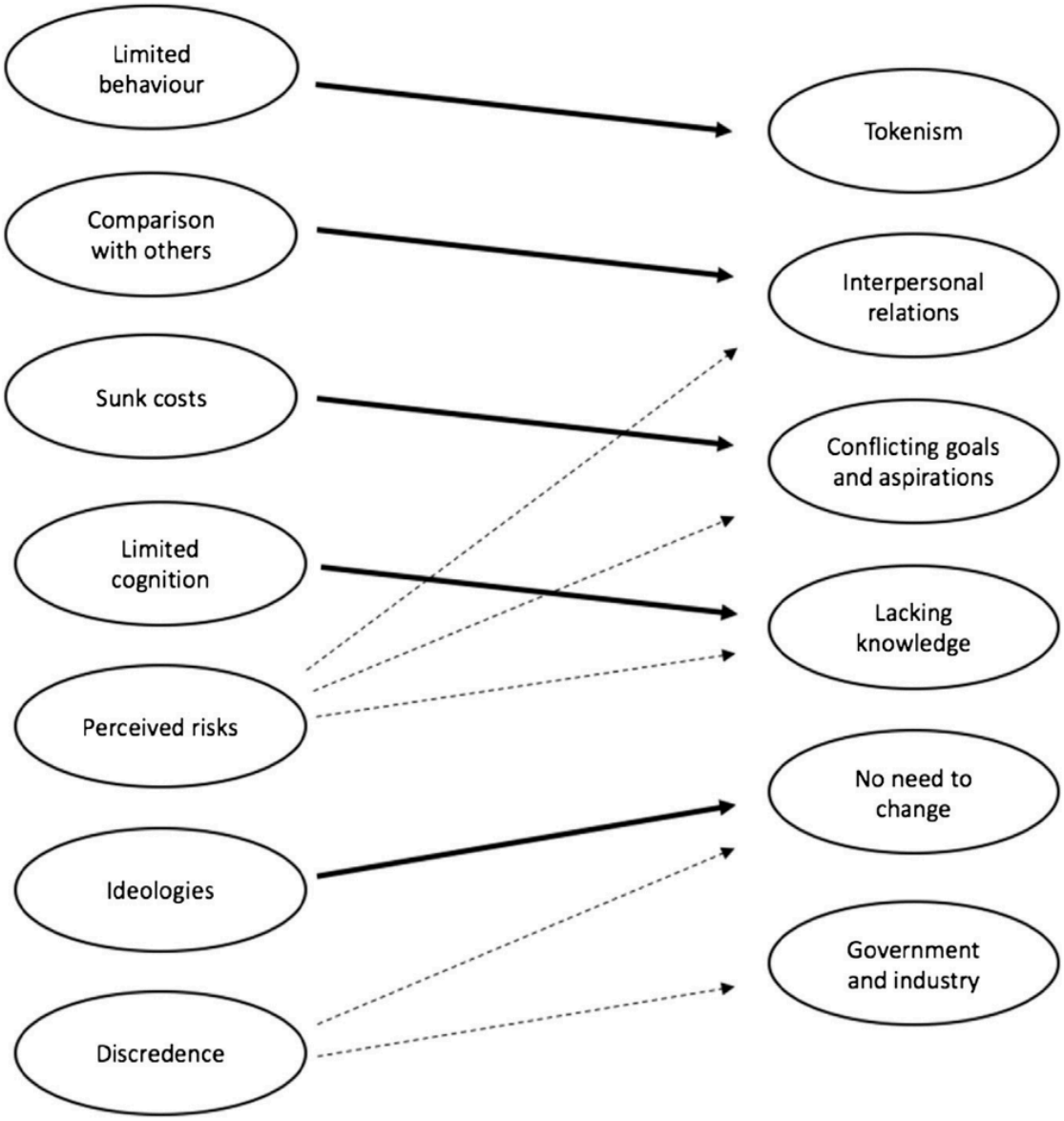

Figure 7.1 Gifford's (2011) seven barrier categories (left) in relation to the DIPB instrument (right). *DIPB*, Dragons of Inaction Psychological Barrier.

APPENDIX 9

Figure of the theory of behavioral choice (Gifford et al., 2018)

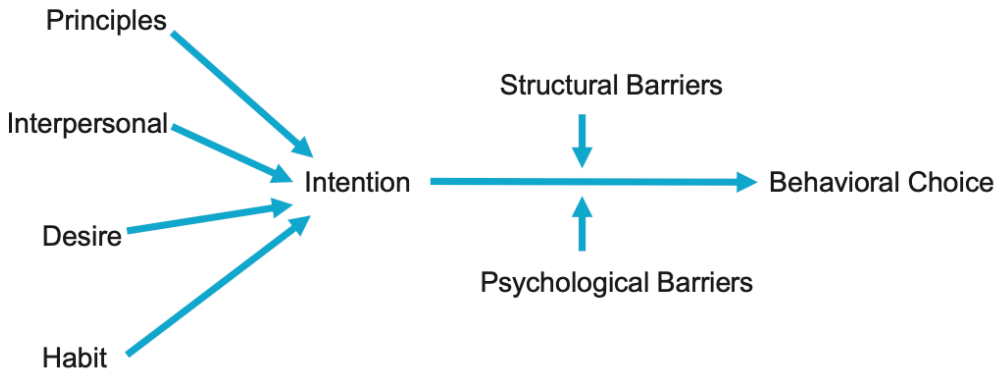

Figure 7.2 The theory of behavioral choice.

APPENDIX 10

Figure of the scientific Ouroboros