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Green Ways – Perspectives of Environmental Psychology Research

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1 Editorial: Pro-environmental action matters – but to whom?

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Abstract

Environmental Psychology and its approaches are key to the understanding of how people respond to global issues such as climate change and environmental degradation. This introductory chapter provides a brief introduction into environmental psychology and its role both within the scientific field of psychology as well as its interdisciplinary relevance. We then briefly summarize the event of the *Summer School 2018* before providing a brief overview of the contributions of this *BfN-Skripten* issue.

1.1 Positioning the role of Environmental Psychology in global environmental issues

Typical questions that environmental psychologists are often confronted with are “What can a single person do to mitigate climate change?” or “Why should it matter whether I fly or not if everyone else is flying?” Well, fair enough. These questions need answers, given that many people are concerned about the state of our world, and would like to engage in pro-environmental action. The step towards actually changing behavior, however, is often huge, and many barriers exist that prevent us from acting accordingly. This is at the core of an environmental psychology perspective that directly addresses humans’ impact on the environment (besides other core themes of environmental psychology that look at the impact of the environment on the human psyche and human behavior). Environmental psychologists seek to understand how the human psyche affects the environment via human behavior. So, on a very basic level, environmental psychology can be defined as the subdiscipline of psychology that deals with human-environment interactions (Graumann & Kruse, 2008). As such, it is a research field that strongly depends on the input of other disciplines and policy decisions, making it an inter- and transdisciplinary endeavor.

Environmental psychology deals with a variety of research topics concerning the natural environment but also built environments and their interaction with human beings. It can inform us about the catalysts and barriers that prevent and enable pro-environmental behavior. Over the past decades, a number of theoretical and empirical models were designed that took into account the human psyche in response to the environmental crises, revealing the role of psychological concepts such as attitudes, norms, behavioral control, efficacy but also political ideology, moral values, routines, just to name a few (for a detailed overview of such variables, see for example Ajzen, 1991; Bamberg & Möser, 2007; Schultz, 2001; Matthies, 2005). More recently, researches began acknowledging that beyond such individualistic variables, models of collective behavior need to be taken into account when it comes to the appraisal of and response to environmental problems (Hornsey & Fielding, 2016; Fritsche, Barth, Jugert, Masson & Reese, 2018). The reader of this BfN-Skripten issue will experience the manifold approaches current research in environmental psychology addresses, presented by leading experts in the field and promising PhD researchers.

What is important to note, however, is that we are aware that psychological concepts and processes alone will not suffice to combat climate change and environmental problems in general. Rather, we want to point out that environmental psychology is – by definition – concerned with environmental issues, which, in turn, are multidisciplinary determined. As such, we see environmental psychology at the nexus of technological innovations, policy making, infrastructural capacities and an economic system that all influence people's environmental appraisals and responses. So, while groundbreaking research in environmental psychology can be highly disciplinary, its consequences often go beyond while at the same time, all those contextual conditions inform environmental psychology research. For example, policy-induced fees for plastic bags can reduce plastic bag use drastically (as shown in Ireland) and providing and supporting use of alternative energies can increase their acceptance. Thus, it is one task of environmental psychologists to show how, and under which conditions, humans act pro-environmentally within their meso- and macrostructures. Saying that, one other task is to convince policy and decision makers to provide structures, benefits and "nudges" that are built on rigorous psychological theoretical and empirical work. We believe that the contributions of this volume provide a wide overview over the themes and approaches helpful in bringing forward a more environment conscious humanity.

1.2 The Summer School on Vilm

The Federal Agency of Nature Conservation set out to establish a bi-annual representative survey of nature awareness in Germany. Every two years since 2009, around 2,000 respondents representative for the German population are asked about their awareness, knowledge and attitudes towards nature and environment, about policy decisions and specific themes of nature conservation. In 2016, these studies were for the first time complemented by an international summer school on environmental psychology at the International Academy for Nature Conservation Isle of Vilm. The summer school 2018 thus was the second instalment of what we hope will become a bi-annual, regular event. Again, it brought together young and highly motivated PhD students who discussed and presented their work – both among each other but also with distinguished national and international experts. A core of each summer school is the workshop phase in which students and teachers get together to approach a specific research question and generate ideas on how to tackle these. Thirty-eight students from eight countries took part in the 2018 event. Our Keynote speakers this year came all the way from Australia (Kelly Fielding), the UK (Birgitta Gatersleben), and Norway (Christian Klöckner). The speakers covered very diverse themes so that this summer school, as the previous one in 2016, provided an overview of state-of-the-art research currently conducted in Environmental Psychology. We are proud and thrilled that many of the findings presented at Vilm now made their way into this Volume of the BfN-Skripten, thus making a sound contribution to the dissemination of environmental psychology knowledge to nature conservation agencies, NGOs, universities and the general public.

1.3 The Contributions of the Summer School 2018

In the following, we will briefly summarize the contributions to this volume.

GATERSLEBEN (pp. 13-20) introduces the reader to the effect different forms of the natural environment may have on human wellbeing. She reviews prominent theories that explain why natural environments have a profound impact on our health and well-being. Yet, not all

natural settings have a positive impact. Empirical evidence suggests that some settings are more restorative than others. Settings that promise large biodiversity, may not be the most appealing. Based on these empirical findings, Gatersleben provides different advices to practitioners, depending on whether the goal is to increase biodiversity or to provide a restorative environment for people.

The paper by KLÖCKNER (pp. 21-28) provides a useful introduction with an overview on central theories in environmental psychology and their implications for environmental communication in the domain of nature protection and preservation. In his paper, he first introduces a general systemic model of human behavioral practices, highlighting the interdisciplinary links between psychology and sociology. He then sets out to explore more on decision models and a model of behavior change. The importance and interplay of intentional, as well as habitual processes, perceived constraints, norms, values, and social influence for behavior change is outlined. Beyond these theoretical and conceptual analyses, his contribution also highlights that we as environmental psychologists should try to think more "out-of-the-box": He presents some communication strategies including art and games that can certainly enrich environmental communication. All this feeds into a concise discussion on the issues discussed in this chapter and might be of value for campaigns on environmental preservation.

In a different theoretical approach, FIELDING (pp. 29-36) makes a strong point for bringing social identities more strongly into environmental psychology research and thinking. Based on the idea that the current environmental crisis calls for broad, concerted and cooperative action, FIELDING highlights that social identities - which stem from our membership in social groups - can have a tremendous impact on environmental attitudes and behavior. Presenting basic tenets of the social identity approach, she uses examples from her and other labs that vividly illustrate how social identities influence the importance we place on environmental issues, and whether we engage in actions that help or harm the environment. Her analysis does not stop here – indeed, she provides some very useful, social-identity based strategies that could help to promote greater grass-roots action to protect the environment.

Building up on this view, SAGERT (pp. 37-42) makes a strong and empirical point in presenting Environmental art as a promising environmental communication strategy. The idea that art combines a more sensory, personal and emotional approach compared to classical informational strategies is exemplified through describing an environmental art workshop. His study complementing this art workshop considers several psychological variables. He argues that creative hands-on exercises with different environmental artworks influenced participants' environmental attitude. While preliminary, the effects of environmental art on attitudes and behavior may reflect an exciting complement to classic campaigning and other communication strategies.

The contribution by WULLENKORD (pp. 43-52) is motivated by the observation that despite pro-environmental attitudes, most people ignore the reality of climate change in their everyday lives. In her chapter, she argues that this may be a sign for internal conflict and attempts to protect the self. Building up on Self-Determination Theory, WULLENKORD argues that promoting the satisfaction of basic psychological needs (relatedness, competence, and autonomy) may foster intrinsic and autonomous motivation for pro-environmental behavior that is direly needed in the transition to a socially and ecologically just society. Her empirical investigation then focuses on the investigation of the associations between satisfaction of

basic psychological needs, self-protective strategies, and pro-environmental behavior, with the ultimate goals of developing effective interventions.

The chapter by LOCHNER (pp. 53-58) aims to bring together psychological research and education. With the concept of Virtual School Garden Exchange (VSGE) – a virtual international networking of learners with a focus on their school gardens and related issues using digital media like videos, photos or video conferences – VSGE uses the topic of school gardens to induce an exchange between learners. She describes how this concept integrates and implements the global perspective of Education for Sustainable Development (ESD) in local school garden work, showing that pro-environmental education can have an impact in early stages of peoples' lives.

In an attempt to bring laboratory research in environmental psychology a bit closer to reality, LANGE, STEINKE & DEWITTE (pp. 59-64) designed a computer task to measure pro-environmental behavior in the laboratory. This is important, given that many experiments rely on self-reported assessments of participants or field experiments that may be prone to confounding influences. In their contribution, the authors review data from two studies that suggest the usefulness of this task, as it accurately measures pro-environmental behavior. Based on these results, the authors then exemplify how such a behavior task may contribute to improve our understanding of pro-environmental behavior and the promotion of sustainable behavior change.

In a very impactful and visible research, HEIDBREDER (pp. 65-72) argues that people are increasingly realizing that plastic waste is a major environmental pollutant. Evidently, the ubiquitous use of plastic is evolving into a serious global problem that the modern society must solve. In her chapter, HEIDBREDER argues that consumption of plastic is a tremendous driver of this problem so that the reduction of plastic consumption must become priority. With the general public having an influential role through their purchasing decisions, she discusses major levers for human decision making, presenting the results of an online-survey that explores the drivers of people's private and political behavior involving plastic packaging reduction. Most importantly, her research suggests that moral considerations and control beliefs may be particularly useful in private and political interventions that target the reduction of plastic use.

Another focus on understanding consumption patterns is presented by LALOT (pp.73-82). Her research builds upon the idea that consumption feedback (e.g., feedback about one's own consumption patterns) can take a critical role in understanding – and altering – consumption behavior. However, she also shows that such feedback can have unexpected effects, sometimes motivating people to increase their efforts but also sometimes demotivating them and leading to a reduction of subsequent efforts. Her approach to solving these contradictory findings is based on underlying motivations of people. Specifically, her studies suggest that positive feedback can be construed either as a guide for future behavior or as an excuse justifying a relaxation of further efforts. Based on these analyses, LALOT provides sound advice on how to develop effective feedbacks, both positive (i.e., informing someone that their current behavior is actually quite sustainable) and negative (i.e., informing someone that their behavior is not sustainable enough, or less sustainable than average).

The work by BUTLAR & WALTHER (pp. 83-88) examines how ambivalence may influence pro-environmental behaviors. In the context of meat consumption, they review how ambivalence is particularly present in attitudes towards meat. On the one hand, meat is perceived as something positive as it provides traditions and enjoyment to many people; on the other

hand, meat is perceived as negative as its production is detrimental for the environment, for health, and causes the death of millions of animals. Studying meat-related ambivalence allows examine how omnivores (i.e., meat-eaters) and non-omnivores deal with the so-called meat paradox - a prime example of the state of ambivalence. The contribution of BUTTLAR & WALTHER demonstrates that omnivores generally experience more meat-related ambivalence than non-omnivores, indicating that most non-omnivores reconciled their ambivalence while refraining from meat. More importantly, omnivores who experience high levels of ambivalence towards meat seem to cope with their conflict via moral disengagement, allowing them to maintain their dietary practices. The obvious implications of these findings are summarized, and the authors suggest some ideas on how attitudinal and behavioral change regarding pro-environmental and consumer behavior could be achieved.

In an attempt to address often detrimental behavior change between being at home and being on holiday, JOHN, WHITMARSH & XENIAS (pp. 89-100) investigated the behavior of tourists at the Brecon Beacons National Park, in South Wales, UK. With around five million visitors per year, it becomes particularly visible how tourism can lead to a rise in environmentally damaging behaviors. Together with the National Park authority, the authors seek to encourage visitors to perform more pro-environmental behaviors. In their review, they outline a case for research investigating visitor behaviors, attitudes and beliefs, discussing the current literature around the antecedents of pro-environmental behaviors and how they mediate behavior. A brief outline of methods for the on-going research is followed by a summary of implications for practitioners on interventions and policy. Finally, some initial suggestions are made on how research can help inform policy and interventions with a special focus on the innovative use of GPS logging.

WOLSTERHOLME, POORTINGA & WHITMARSH (pp. 101-106) conducted an interview study that aims to shed light on the motivation to reduce meat consumption as a means to achieve climate change goals. Specifically, the authors explored the underlying motives driving meat consumption, awareness of the link between meat consumption and climate change, and peoples' willingness to eat less meat. Based on several interviews with meat-eaters, it seems that meat consumption was an unquestioned dietary habit reinforced by social norms, as well as by taste preferences and health concerns. Interestingly, most participants appeared to be unaware of the link between meat consumption and climate change, suggesting that more information campaigning might represent an additional important step.

NOCKUR & PFATTHEICHER'S contribution (pp. 107-112) looks at pro-environmental behavior from a somewhat different perspective, arguing that interventions aimed at encouraging ecological behavior often assume that people are motivated to change their behavior. However, it is also possible to approach the problem of lacking pro-environmental behavior from a perspective that takes into account that a substantial proportion of individuals is *amotivated* to engage in ecological behavior. The authors find evidence for the prevalence of environmental amotivation, showing that it predicts ecological behavior beyond other constructs associated with ecological behavior. Some experimental results suggest, however, that even amotivated people may act pro-environmentally when confronted with punishments. NOCKUR & PFATTHEICHER then present some implications for intervention planning that needs to take into account that amotivated individuals may not be too willing to act ecologically based on internal motivations.

In the field of sufficiency research, TRÖGER & REESE (pp. 113-122) aim to figure out experts' views on sufficiency and its role for a socio-ecological transformation. In a qualitative

interview study, they assessed experts' views with a particular focus on current catalysts and barriers within society that would determine a shift to a potential sufficient society. Their chapter first outlines the research background of sufficiency, assumptions regarding the so-called intention-action gap, as well as the qualitative methodological approach. Finally, TRÖGER & REESE present findings of these expert interviews, illustrating some indicative categories experts use to position their views and assessments.

We think that these contributions will inform scientists, practitioners and other interested groups alike about the latest innovative state-of-the-art research among (both young and senior) environmental psychologists. Happy reading!

Gerhard Reese, Anne-Kristin Römpke, Andreas Wilhelm Mues & Kathrin Bockmühl

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2 The restorative benefits of biodiverse nature

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Abstract

There is overwhelming evidence that exposure to natural environments can help people recover from stress and mental fatigue. But does this mean that interventions that aim to protect or promote biodiversity will also benefit human wellbeing? A review of theories and research evidence in environmental psychology explores what types of natural environments may support psychological wellbeing and what this may mean for biodiversity. It suggests that not all nature is restorative and the link with biodiversity seems inconsistent. It is concluded that increasing the amount of well-maintained natural elements in built settings may benefit biodiversity as well as human wellbeing. Wilder, less maintained natural environments, however, are unlikely to be directly beneficial for psychological restoration, but may in fact benefit biodiversity.

Figure 1: The Isle of Vilm – a restorative biodiverse environment? (B. Gatersleben)

2.1 Introduction

Linking human wellbeing and environmental quality is key to the idea of sustainable development. Goal 3 of the United Nations Sustainable Development goals, for instance, commits to “promoting mental health and wellbeing”. Examining how human wellbeing and environmental quality interact is therefore an important challenge. An increasing amount of work is being conducted under the umbrella of ecosystem services, which suggest that well-functioning ecosystems can support human health and wellbeing through four processes: support (e.g. soil regulation), provision (e.g. food), regulation (e.g. climate) and culture. The psychological benefits derived from engagement with nature (environmental restoration) falls under the latter, which includes heritage, spiritual, recreational, educational and therapeutic

services (Ma, 2005). These psychological benefits form the basis of this paper which explores what types of environments support psychological restoration and what this may mean for biodiversity.

2.2 Environmental restoration

Environmental restoration theory suggests that exposure to certain environments can promote recovery from stress and mental fatigue more quickly and fully than rest alone can. According to Ulrich et al. (1991) this is primarily an affective process. The theory is based on the principle of quick-onset emotional responses that motivate approach-avoidance behaviour. Such responses have great evolutionary adaptive value as they enable us to quickly flee from threat and approach environments that support survival. As such, natural environments indicative of survival evoke spontaneous positive affective responses, replacing negative mood and reducing stress (Ulrich, 1983). For Kaplan and Kaplan (1989) restoration is primarily a cognitive process. Their *Attention Restoration Theory* suggests that any prolonged mental effort results in mental fatigue. Restoring such directed attention fatigue requires something that makes directed attention temporarily unnecessary. Restorative environments have qualities that draw in people's attention involuntarily (soft fascinating qualities). In addition, they provide a sense of being away (from the demands that caused the depletion), extent (the richness in fascinating stimuli) and are compatible with what the person wants to do (e.g. walk, rest).

Both Ulrich and Kaplan suggest that natural environments are more likely to contain features that are innately fascinating. However, restoration is only likely when these fascinating features do not reflect a threat to safety or comfort. For Ulrich, positive affective and aesthetic responses to natural environments stem from elements of a scene indicative of survival. Natural settings characterised by threat or risk elicit dislike and fear, thereby generating adaptive avoidance (Ulrich, 1983). Kaplan (1995) states that "much of what was important to the evolving human - wild animals, danger, caves, blood, to name a few examples - was (and still is) innately fascinating and thus does not require directed attention" (p 170). However, high or chronic levels of danger can hamper restoration because they make the environment incompatible with goal achievement (Kaplan, 2001).

Non-threatening natural environments, therefore, are perceived to be particularly beneficial for psychological restoration. Such restorative environments contain gentle distracting features that aid the recovery from stress and mental fatigue.

2.3 Evidence of the healing benefits of nature

There is growing evidence that nature is beneficial for human wellbeing. Those who live in areas with higher proportions of greenery are less likely to suffer from mental health issues (Beyer et al., 2014; Nutsford, Pearson, & Kingham, 2013; van den Berg, Maas, Verheij, & Groenewegen, 2010; Vries, Verheij, Groenewegen, & Spreeuwenberg, 2003). Moreover, Alcock, White, Wheeler, Fleming, and Depledge (2014) demonstrated that moving to a greener area is associated with improved mental health but the reverse is true for people who move to a less green area. Many field and laboratory experiments have shown that exposure to natural environments supports recovery from stress (Bowler, Buyung-Ali, Knight, & Pullin, 2010) and mental fatigue (Ohly et al., 2016). Active (e.g., gardening) as well as passive (viewing) exposure to green spaces has beneficial effects. Even looking at a green

roof for as little as 40 seconds has been shown to support stress reduction (Lee, Williams, Sargent, Williams, & Johnson, 2015).

The presence of green space can also help prevent future health issues by promoting physical exercise (helping to prevent obesity and a range of serious health problems), and through building a stress buffer. For instance, living with nearby nature can help children cope better with life stressors (Wells & Evans, 2003) and contact with nature can immunise against future stressors (Parsons, Tassinary, Ulrich, Hebl, & Grossman-Alexander, 1998).

Greening urban areas can have significant benefits for biodiversity and provide a variety of habitats for different species. It is evident that it can also have significant benefits for human health and wellbeing by supporting recovery from stress and mental fatigue. This, in turn, can have significant advantages for the social and economic development in these areas due to the positive effects of psychological restoration on mental health, work performance and education (Bragg & Atkins, 2016; Kahn Jr & Kellert, 2002; Nieuwenhuis, Knight, Postmes, & Haslam, 2014).

2.4 What is restorative nature?

It is evident that nature and natural elements have beneficial effects on human wellbeing. However, does this mean that all nature is beneficial or that more nature is better than less? Unfortunately, the answer to this question is not entirely clear, partly due to the variety of natural environments that have been studied. Across different sub disciplines a wide range of environments has been examined, but the majority of studies focus on urban green space (Bratman, Hamilton, & Daily, 2012). Within the field of environmental psychology much of the research tends to compare responses to natural (parks) and urban (streets, plazas) environments. There is relatively little work that examines differences between types of nature or natural elements. The few studies that have done so demonstrate that responses vary and that they are not always positive. For instance, Gatersleben and Andrews (2013) showed that walking through dense forests can increase rather than reduce stress and mental fatigue. Greene (2010) asked 177 people to rate the affective qualities of different natural environments and found that the garden was perceived as most relaxing, followed by the park, and a scene of the open sea or a scene of cliffs by the sea (Figure 3). However, the park was also seen as less exciting (Figure 2). Responses to natural sounds also vary. Although bird song is generally seen as relaxing Ratcliffe, Gatersleben, and Sowden (2013) showed that this is not always the case. The acoustic qualities of the sound, the associations people have with the birds and their behaviour, as well as individual differences all play a significant role in explaining the perceived restorative qualities of bird sounds.

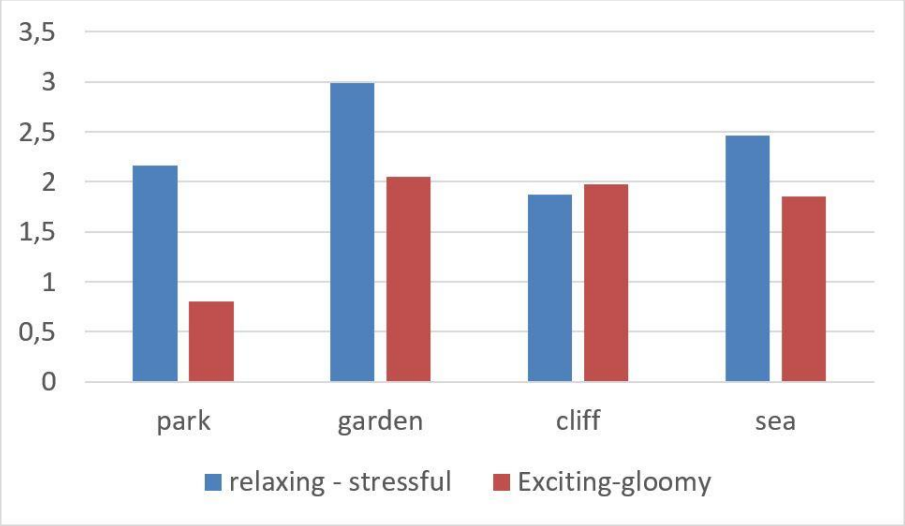

Figure 2: Affective appraisals of different natural scenes.

Figure 3: A scene of cliffs by the sea (Wales) – relaxing as well as exciting; (B. Gatersleben)

2.5 Biodiversity and environmental restoration

It is clear that not all types of nature may promote restoration. The question then is whether biodiversity is positively linked to environmental restoration. The answer, however, is not clear. On the one hand, the evidence for the psychological benefits of green space for human wellbeing is consistent. However, as noted earlier restoration is not likely when the environment is seen to harbour a threat. Arguably natural environments with high levels of biodiversity (plant and species richness) may harbour more risks, threats and dangers than those with lower levels of biodiversity. A biodiverse environment may be less well-kept and more dense and dense natural environments (Figure 4) do not support restoration (Gatersleben & Andrews, 2013). They may also harbour more animal threats as well as

inconveniences (fallen trees, bugs), which can hamper restoration by intervening with compatibility. Some natural environments or elements evoke disgust and fear rather than fascination, at least for some people (Bixler & Floyd, 1997).

A few studies have examined biodiversity in relation to psychological restoration. These studies revealed varied results. For instance, Grahn and Stigsdotter (2010), found that perceived serenity and naturalness were linked to the perceived restorative qualities of urban parks. However, links with perceived species richness were weaker. On the other hand, Marselle, Irvine, Lorenzo-Arribas and Warber (2016) evaluated the wellbeing benefits of a 13 week walking program and found that improvements in positive affect as a result of participation in the program were mediated by perceived bird biodiversity and naturalness, among other things. Carrus et al. (2015) examined the use and perceptions of four different types of environments: urban environments low or high in biodiversity (streets with trees or park) and semi-urban environments with low or high biodiversity (planted woods or nature reserve). They found that biodiversity positively affected perceived restorative qualities, especially in the urban environments. The problem with these studies is that they rely on perceptions of biodiversity rather than objective measures. This is particular problematic because people may not necessarily have a clear understanding of what biodiversity means. Greene (2010), for instance, conducted a survey with 205 householders in Ireland asking them about the promotion of biodiversity in their gardens. She found that 40% of the respondents had not heard of the term biodiversity. Moreover, the majority (71%) were not willing to make changes to their garden to promote biodiversity. Those who did, said this was primarily to promote wildlife (mostly birds). Fuller, Irvine, Devine-Wright, Warren and Gaston (2007) carried out one of the few studies that included an objective measure of biodiversity. They conducted biodiversity sampling of green areas in a city in the North of England and interviewed 312 visitors of those areas. They found positive links between biodiversity and wellbeing. The strongest links were found for plant richness, weaker links were found for bird richness and no effects were found for butterfly richness. Moreover, there was only a weak link between perceived and measured butterfly and bird richness.

Taken together these findings suggest that there is no clear link between biodiversity and environmental restoration. This may be partly due to the way in which biodiversity has been measured in existing studies, which focused mostly on perceived rather than actual biodiversity. More evidence is clearly needed to examine the link in more detail.

Figure 4: Dense woods (Surrey), high biodiversity but low restorative qualities. (B. Gatersleben)

2.6 Implications for environment protection interventions and policies

Engagement with and exposure to natural environment clearly has beneficial effects for human health and wellbeing. Walking in nature, living near nature and even just seeing nature from your home, school or office window is beneficial. However, not all types of natural environments and not all kinds of natural elements are beneficial for all. Although more clear evidence is needed to examine the ingredients of a psychologically restorative environment, two aspects are clearly important: safety and gentle distraction. This means that very dense environments, muddy fields, dense woods, loud bird sounds, prickly bushes, or stinging insects, are unlikely to support restoration.

The question as to whether more biodiversity is associated with greater psychological restoration, therefore, has no clear answer. Although positive links have been found with perceived biodiversity it is not always clear what this means. Different people have different perceptions of biodiversity and many don't know what it is. People respond positively to plants, birds and animals, but not to all of them and not too much of it or too many.

So what does this mean for environmental protection interventions and policies? Arguably this is a positive story. Providing more natural spaces and elements in built areas (gardens, urban areas, urban parks, streets, work environments, schools) will be beneficial for human wellbeing. On the other hand highly biodiverse environments are unlikely to be attractive to the majority of people as they threaten comfort and safety. This, in turn, can benefit biodiversity as it helps minimise human influence and interference in these area.

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3 Making people change – strategies and new pathways for pro-environmental communication in the preservation domain

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Abstract

This brief chapter provides an overview about central theories in environmental psychology and their implications for environmental communication in the domain of nature protection and preservation. Starting out with a general systemic model of human behavioral practices, which integrates both assumptions of psychology and sociology, the remainder of the chapter zooms in on decision models and a model of behavior change. The importance and interplay of intentional, as well as habitual processes, perceived constraints, norms, values, and social influence is outlined. Furthermore, some thoughts are presented in the light of the analysed theories, how "out-of-the-box" communication strategies such as art or games might compliment more traditional environmental communication strategies. Finally, conclusions are presented, how the issues discussed in this chapter might be of value for campaigns on environmental preservation.

3.1 Why is psychological knowledge important for solving environmental issues?

To solve today's challenges to society such as global climate change, depletion of natural resources or extinction of species, a joined action of societal, economic, technological, and behavioral changes is necessary. These required fundamental changes make actions by people in different positions of the societal system necessary, may they be decision makers in the policy domain, investors, consumers, citizens, educators, interest groups, or something different (or all of that, because usually people have many such roles in their everyday lives). Investors decide which investment to prioritize over another, politicians decide where to focus policy (and what not to do), consumers prefer certain products over others, decide how to use them and decide how to dispose of them, educators prioritize some learning content over others, and so on.

That being said, so is the outcome of human behavior always embedded in a complex system of social, physical, technical, and political influences that also determine what people can decide by defining the boundary conditions of possible behaviors and providing the assignment of meaning to behavioral patterns (which is the cultural impact on what people do). Figure 5 (Arnesen, 2013) gives a structured overview about such a behavioral context, where individual behavior in the center is determined by individual factors such as attitudes, norms, habits, intentions, knowledge, skills or values, but this behavior is embedded in a social context with varying significant other people (family, friends, neighbors, colleagues, …), a physical context with existing technology and other materialities, and finally a policy and governance context. Interestingly, what results when you cut across all layers becomes from my point of view rather close to a concept that sociologists would refer to as a social practice (Hargreaves, 2011; Shove, Pantzar, & Watson, 2012).

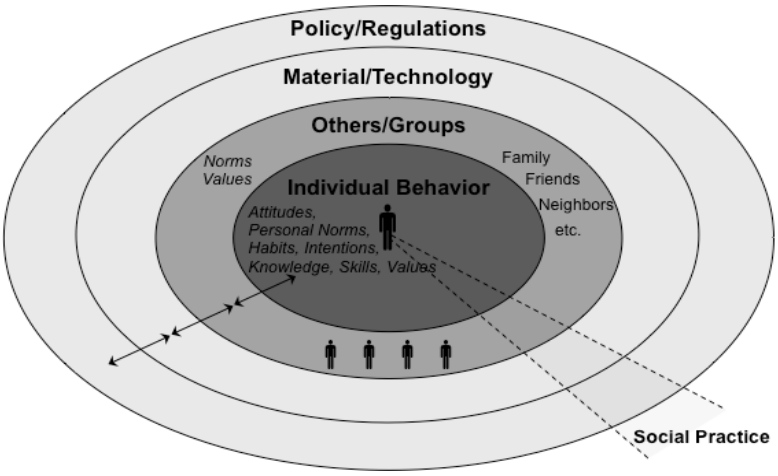

Figure 5 : A system of individual, social, physical, and regulatory determination of behavioral practices (Arnesen, 2013).

When diving deeper into such system, questions arise how to understand people's behavior, how to change it, and how to find ways to communicate to them about pressing issues. The following sections of this paper outline briefly, how I see the state-of-the-art in these areas.

3.2 Understanding human choices

One of the first steps in influencing people's environmental behavior is to understand why they make their choices and what the key leverage points are to influence them. Environmental psychology has a rather long tradition of research along these lines, mostly inspired by more generic behavior or choice theories from other psychological disciplines like social psychology (Klöckner, 2015). The more prominent theories in this domain are the Theory of Planned Behavior (Ajzen, 1991) and the Norm-Activation-Theory (Schwartz & Howard, 1981), but also other theories have been developed to understand people's environmental (non)actions. More recently, attempts have been made to integrate the theoretical traditions to get a more comprehensive framework model of drivers of environmental choices (Bamberg & Möser, 2007; Klöckner, 2013a). The Comprehensive Action Determination Model (CADM), which I proposed (Klöckner, 2013a, 2013b; Klöckner & Blöbaum, 2010), is one of these attempts. In line with established theory, the CADM assumes that environmental choices on the individual level are influenced directly by five types of variables (see Figure 6): Intentional processes, perceived control / constraints, habitual processes, social processes and normative processes.

Intentional processes might at first glance be in the main focus of any campaign to change people's behavior. They refer to deliberations of what people want to do, what they will make an effort to achieve. Implicitly, the underpinning assumption is, that people chose the behavioral alternative that gives them the best cost-benefit balance. This relates to the typical strategies of providing people with information about costs or benefits they did not know about when a behavior change is desired. However, research as well as common sense show that people do not always do what they want to do, so here the question arises, why this happens.

One possible distortion of the process of coming from an intention to an action (the distortion is indicated by the dotted arrows in Figure 6) is that humans develop routines and habits in situations where behavior is repeatedly performed under stable circumstances. Imagine that you would need to make every single decision again every day (e.g., when and how to brush your teeth, prepare breakfast, etc.). Not much time and cognitive capacity would be left for other things. Thus, humans are able to "store" knowledge about choices that lead to a desirable outcome and prioritize them the next time the choice is to be made again under the

same circumstances. If you have tried the bus the first time travelling to work for your new job and it carried you there to your satisfaction, the need to spend time and energy elaborating on that choice becomes smaller the next day, and smaller the next day, and even smaller the next … until the choice is made completely automatic. The beneficial habits and routines are to free cognitive capacity for us, the problematic they become, once we intend to change our behavior. Imagine you have become a routine bus user for your way to work, and then you try to decide to exercise more and use the bicycle instead. It will take a strong will and probably many trials to change from bus (which is automatically chosen by your habits) to bicycle.

The second interfering factor between intentions and behavior are objective or subjective constraints. All intentions to use the bus will fail, if there is a bus strike that morning. The likelihood of taking the bicycle to work will be much lower if the light drizzle that afternoon is perceived a major obstacle. Mostly, such constraining factors are subjective representations of the objective constraints. What is perceived difficult to do, varies from person to person even under the same objective conditions.

On the level behind intentions, another set of variables becomes relevant. Here, social influence plays out its power: What other people expect from you, what they tell you to do, what you think they expect from you, makes you adjust your intentions accordingly. Interestingly, social influence can be split into at least two main categories: What other people say (referred to as *injunctive norms*) and what they actually do (*descriptive norms*) (Thøgersen, 2006). Part of the social influence is also internalized and adapted into a personal value system, which tells us in a given situation what is morally right to do. Such values are stable reference frames for our behavioral decisions, but they are also rather far away from the behavior itself, so a lot of interference might happen into this process (Klöckner, 2013b). A lot of research has been done, under which conditions personal norms and values have an impact on behavior, pointing out that it is relevant to frame a situation as morally relevant to get people into a normative frame (Lindenberg & Steg, 2007).

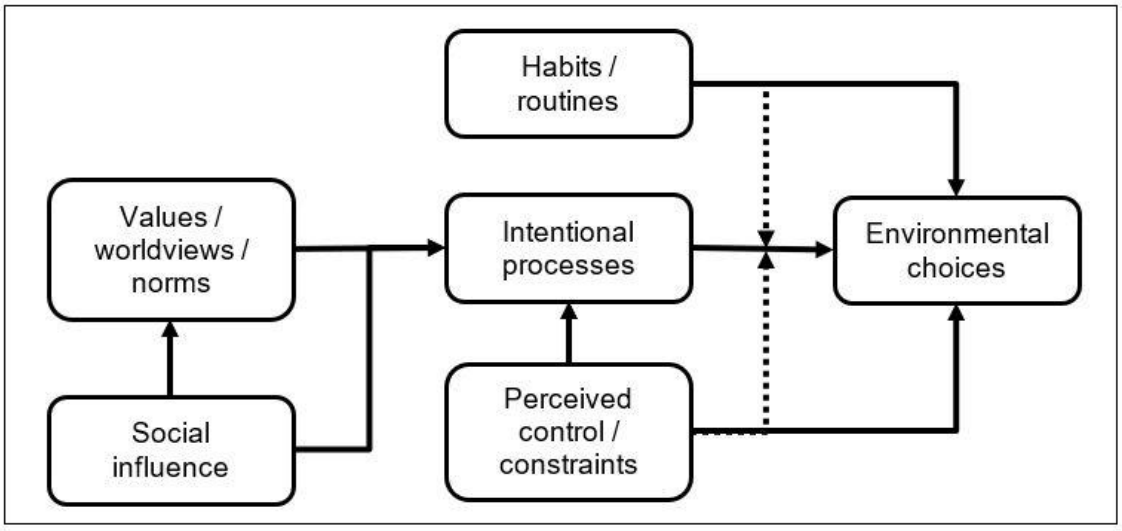

Figure 6: A simplified Comprehensive Action Determination Model.

3.3 Understanding choice is not the same as understanding change

Whereas the framework models described above (Figure 5 and 6) give a good overview about variables that might be relevant to focus on, when addressing people's environmental behavior, research has shown that understanding behavior is not necessarily the same as understanding behavior change, the latter being ultimately a question of understanding dynamics in decision making. This is why Bamberg (2007, 2013a, 2013b) started looking into

the potential of health psychological models for overcoming the static character of existing environmental psychological models. Eventually, he proposed the Self-Regulation Model of Behavior Change, which is both based on the models presented in the last section and the Transtheoretical model (Prochaska & DiClemente, 1994). Figure 7 presents a simplified version of the model.

The most important assumption of the model is that behavior change is a process of multiple steps, where transition to the next step is characterised by forming a special type of intention, getting closer and closer to actually changing behavior. In the first transition, people need to form a *goal intention* to do *something* about a problem. In other words, the first stage of change (leaving the predecision stage) is all about realizing that there is a problem with my behavior and something needs to be done. In this stage, social influence, values, emotional reactions to that something of value might be harmed, but also general assessments of feasibility of a change are important. The second step of change (leaving the preaction stage) is selecting, which alternative behaviors to go for. Here variables such as attitudes and perceived control for specific alternatives become relevant. In the third step, concrete planning of implementing the new behavior starts. Here planning abilities of the individual become relevant. The last step is about stabilizing the behavior, making it a new habit, which also involves the ability to return after episodes of relapse. Often, progression through these stages is not linear, but rather back and forth (Klöckner, 2014). The interesting implication of this model is, that people might be in a process of changing behavior long before this actually shows in their actual behavior. Furthermore, the model implies, that different variables are relevant for different parts of this journey and that some interventions are more effective earlier in the process than others and vice versa (Klöckner & Nayum, 2016, 2017).

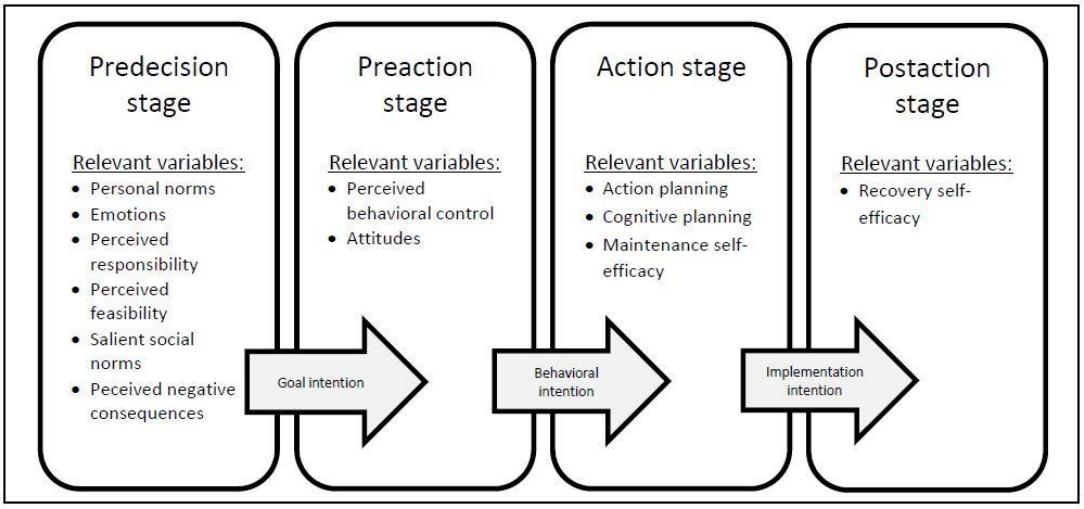

Figure 7: A simplified Self-Regulation Model of Behavior Change.

3.4 Communicating outside the box

Since many of the intervention strategies an environmental agency can realistically have are within what will be understood as communication-based, it is relevant to discuss, what some more out of the ordinary strategies could contribute to behavior change within the models presented above. As already mentioned earlier in this chapter, standard information campaigns assume that people are inactive or show behavior with detrimental environmental consequences because they do not have information about these effects in the evaluation

when they make their decisions. A recently conducted document analysis of energy policies in the European Union (Klöckner et al., 2018) shows that the two main policy instruments mentioned in the documents with respect to changing people's behavior are giving economic incentives and providing information. However, the models presented above make it very obvious, that other components might be at least as relevant in the process of change. Two of them are an emotional activation (stage 1 of the process of behavior change) and developing skills to plan, implement and maintain new behaviors, much of that being related to acquiring procedural knowledge about how things work in practice. In the following two paragraphs, I will present two innovative environmental communication measures, addressing these two components particularly, namely art and games as vehicles of environmental communication.

In the Climart-project (www.climart.info) we researched the psychological effects of being confronted with artworks inspired by climate change. Within the project, we also commissioned an artist (Michael Pinsky), who created in a dialogue with the research team an art installation called "Pollution Pods" (for a video and more information, see the project website). Five large geodesic domes were constructed, connected by corridors, where the visitors could walk through an experience directly on their bodies the air quality in five cities around the world (Trondheim, London, New Dheli, Bejing, and Sao Paolo). We simulated the temperature, the smell and the visibility in each of the cities with a rather elaborate technology. Reactions of the audience expressed in a survey and in qualitative interviews indicate, that this bodily experience makes the issue of air pollution a much more emotional experience, especially through the experience of the contrasts between the cities. This emotional activation feeds directly into the first stage of the self-regulation model of behavior change. In general, an analysis of different artworks and a literature review suggest, that an art based communication approach could be particularly valuable in cases where environmental problems lack an emotional activation of the public and a "catching" narrative (Roosen, Klöckner, & Swim, 2018). However, the results from the project show also, that this emotional activation can result in very different reactions: from being stunned and unable to act, via neglection, to actually considering action. Thus, art experiences in the environmental domain seem to be in need for a framing which takes the audience through the experience and towards action.

In a second communication project, we are studying the opportunities of using games (both analogue and digital) for environmental communication. There are more and more board games, card games, computer games and playful apps out there (e.g., CO_2 - the board game, Green Deal, Global Warming, Fate of the Earth, ECO, Settlers of Catan – Oilspring scenario, to name just a few), with the assumption that gamifying environmental education will enhance learning and present opportunities that other types of learning do not have. However, in developing these games, principles of game design and game enjoyment, which are not always acknowledged, resulting in over-pedagogical games which are simply not fun to play. Based on this, an ongoing PhD project studies the factors enhancing game enjoyment and at the same time foster learning experiences in educational games (Fjællingsdal & Klöckner, 2017). The first results show, that games that give the players room for immersion (= transferring into another world), flow, and enjoyment, games that have a storyline strong enough to carry several hours of gameplay (narrative transportation) and that provide emotional and social experiences have a good potential for learning. Learning in those games occurs through both experiencing things more directly than in mediated learning experiences, thus making things "that you know from before" more vivid and

relevant, but also through providing a safe environment to try new and potentially extreme solutions. Games can be a wonderful testbed for developing radical innovations.

3.5 Implications for environment protection interventions and policies

So what does all that mean for environmental protection campaigns? Since the summer school, that this chapter initially was presented on, was hosted on the beautiful but also rather strange small island of Vilm (a nature reserve protected from interference by humans with exception of activities related to the nature academy), let us use the protection of the island as an example. How do the models and findings presented above tell us something about how to protect nature reserves such as Vilm?

One relevant question might be, what would make people accept the restrictions on the island and behave in accordance with the protection regulations. If we start with the CADM, visitors of the island might comply with the rules for several reasons: (1) they might deliberately decide to do so (forming intentions to do so), by for example having positive attitudes to the goal of the protection activity. Here, several actions might increase positive attitudes, for example information about the value this particular nature reserve has in the context of the larger area. Also, making beliefs about the efficiency of the action salient (by showing the success of the protection activities) could work. (2) Perceived control can be a second important component. Since the main action expected from visitors of the island is not to enter the protected core areas of the island and stay on the (few) tracks on the island, the behavioral control might be regarded as relatively easy. However, clear signs and instructions by the reserve guards about what is allowed and what not will also help increasing the feeling of being able to comply. Furthermore, since the island hosts a nature academy it is also important to establish options for visitors to get a glimpse of the nature that is protected here (most visitors will be curious to know more about the place and see with their own eyes – which also is important for the emotional connection to the place). Establishing opportunities for overnight visitors to implement some of their preferred activities (some people like their daily jogging exercise, some like to swim when at the sea) within the framework of what is acceptable might give them the perception that they can manage to comply. Habits and routines might have an influence on the latter, meaning that activities people are used to will materialize also in the setting on Vilm, even if this is a new environment with less established habits. Establishing social norms of what is acceptable on the island seems to be a key issue for the compliance to the protection rules. Here, all representatives of the nature reserve on the island (including all supporting personnel) have a key role in both communicating what is OK to do (injunctive norms), but also behaving in the correct way (descriptive norms). Since many of the visitors of the island can be expected to have high environmental values already, it is more a matter of activating the relating norms and beliefs than establishing new ones. However, in different contexts this will be very different (e.g., a nature reserve that is not as isolated).

Which leads to the next model, the self-regulation model of change. One could argue, that experiences such as visiting Vilm might impact/trigger behavior change also outside this context (which would be a desirable learning outcome, would it not?). So how would the model predict the potential spillover to other domains? Well, first the visit could be understood as a first-hand experience of the valued and endangered nature which will – at least for some time – induce an emotional drive for contributing to the protection. This is clearly situated in stage 1 of the model. However, since visitors leave again after a short time

back into their own lives, it will be important to make the link between what happens on and to Vilm to what people do in their everyday lives. So, when people leave stage 1, they need to understand the links between their actions and Vilm as an example of nature. Then, concrete actions that would have a traceable positive effect on Vilm would need to be identified, and then underfitted with arguments strengthening positive attitudes and perceived control to implement them. Finally, concrete tips should be given to people who are already in the last stages of change. How to implement the actions planned? How do others make it real?

With respect to games and art, it was interesting to see that Vilm actually hosts a gallery space with large scale photographs of nature on the island. From my personal experience, visiting this gallery enhanced the experience on the island by creating moments of extra reflection. Taking a step back from the nature outside and seeing it through the eye (or better lense) of the photographer highlighted the “personality” of specific natural elements (trees, stones, etc.). The exhibition made the link between nature and humans by picturing natural elements as if they were human. Without having any scientific results about this from the island, I would expect that this experience can contribute to make the nature on the island more personally relevant. It could be explored further, if the island experience might benefit from a game experience, for example by using some of the time on the island to “play” island manager or to play being an animal on the island. This might again enhance the experience of something personal, a narrative that sticks longer than the few days on the island.

How valid these ideas and suggestions actually are for this specific context (or other contexts of nature protection) would need to be explored in more detail, if this was a real project of environmental psychologists collaborating with the nature reserve managers. However, I hope it briefly showed, how environmental psychological research and theory might contribute.

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4 The role of social groups in shaping environmental attitudes and behaviour

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Abstract

Our current environmental crisis calls for sustained and broad-scale changes in the way we think about and behave toward the environment. In this paper I highlight the important role that social identities — which stem from our membership in social groups — can have on environmental attitudes and behaviour. I outline basic tenets of the social identity approach and use examples from my own and others' research to illustrate how social identities influence the importance we place on environmental issues, and whether we engage in actions that help or harm the environment. I conclude with social-identity based strategies that could help to promote greater grass-roots action to protect the environment.

4.1 The environmental crisis and environmental psychology

Recently 15,000 scientists from 184 countries issued a warning that humanity is on a "collision course with the natural world" and that "great change in our stewardship of the earth and the life on it is required, if vast human misery is to be avoided" (Ripple et al., 2017, p.1026). The likelihood of catastrophic climate change has increased, there is runaway deforestation, mass species extinctions, increased ocean dead zones, and falling fresh water availability. We know that it is human behaviour — embedded in our social, economic and political systems — that is largely responsible for our current environmental crisis. How then can we understand and influence environmental decision-making so that we engage in behaviours that help rather than harm the environment?

This is a central question guiding research in environmental psychology. The tendency in environmental psychology research has been to see our environmental decisions and behaviours as largely a function of individual factors. For example, in a recent synthesis of the research drawing on the most common theories in environmental psychology, Klöckner (2013) showed that environmental behaviour is a function of stable values and ecological worldviews, moral factors such as a person's sense of moral obligation to engage in environmental behaviours, habits, attitudes, social norms, and perceptions of control (see also Klöckner's contribution in this issue). Only one of the factors — social norms — explicitly recognises that individuals are embedded in social groups that influence how they think about issues and how they respond to them.

In this paper I foreground how social groups influence how much we care about the environment and the extent to which we engage in helpful or harmful environmental behaviours. I draw on the social identity approach as a framework for my reasoning and I provide examples from my own and others' research to demonstrate the power of social identities for shaping environmental attitudes and behaviour.

4.2 The social identity approach

The social identity approach encompasses two inter-related theories – social identity theory and self-categorization theory (Tajfel and Turner, 1979, Hogg and Abrams, 1988, Hornsey, 2008). According to the social identity approach there are different ways we can think about

ourselves. We can think of ourselves in terms of our personal identity that encompasses the unique characteristics that make us different from other individuals. We can also think of ourselves in terms of our social identities that stem from our membership in groups. These groups can be large social categories (e.g., gender, nationality), or groups we choose to belong to such as professional or interest groups. As an example, I can think of myself as a woman, an Australian, and an academic. Importantly, when we think of ourselves in terms of our social identities, we accentuate the similarities between ourselves and other ingroup members and accentuate the differences between members of the ingroup and the outgroup. For example, if I'm thinking of myself as an Australian, I see Australians as similar to each other and different from Germans. On the other hand, if I'm thinking of myself as an academic, I see academics (regardless of their nationality) as similar to each other and different from non-academics.

There are important consequences of thinking (i.e., categorizing) ourselves in terms of particular social identities. The first is that we assimilate our attitudes, beliefs, and behaviours to align with the norms of that social identity, especially if the identity is important and central to us. Social norms refer to the accepted or implied rules about how group members should and do behave (Turner, 1991). As an example, if I'm thinking of myself as an environmentalist then I aim to engage in (or avoid behaviours) to lower my carbon footprint (see Figure 8). On the other hand, when I'm thinking of myself as an academic, I may engage in behaviours that increase my carbon footprint because they are supported by ingroup norms (e.g., long haul flights to attend conferences).

The social identity approach also reasons that we strive to have a positive and clear self-concept. That is, to know who we are and to think positively about ourselves. When we think of ourselves in terms of our social identities we can satisfy this need by being part of distinctive and positively evaluated groups. One way to achieve this is to favour our own group over other groups in terms of evaluations and distribution of resources (for reviews see Brown, 2000, Hewstone et al., 2002). In other words, we think of our group and the members of the group as better than other groups and we are more likely to assign or agree with our group gaining more resources than other groups. As an illustration of ingroup bias: a common mantra that I often hear amongst my fellow Australians on returning from overseas travel (an experience that is likely to bring their national identity to the fore) is that "Australia is the best country in the world to live".

Putting aside anecdote, past reseach has shown that people judge fellow members of their groups to be more likeable, knowledgable and trustworthy than members of other groups (e.g., Foddy, Platow & Yamagishi, 2009; Tanis & Postmes, 2005). Ethnocentrism (i.e., favouring ones own group over another) could impact on environmental outcomes in a number of ways. For example, ingroup members may reject or be distrustful of environmental messages that come from outgroup members. In situations where there is conflict between groups over environmental issues, it may lead ingroup members to negatively stereotype their opponents so that reaching consensus becomes more difficult.

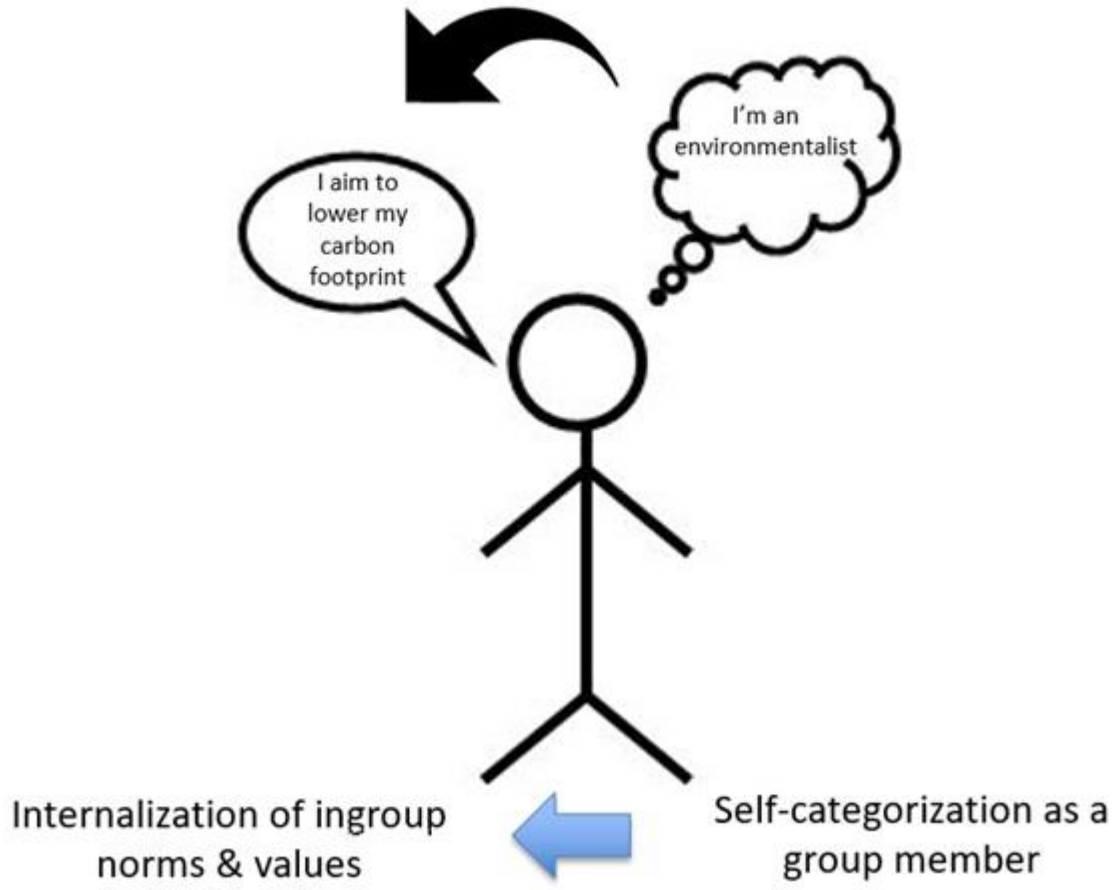


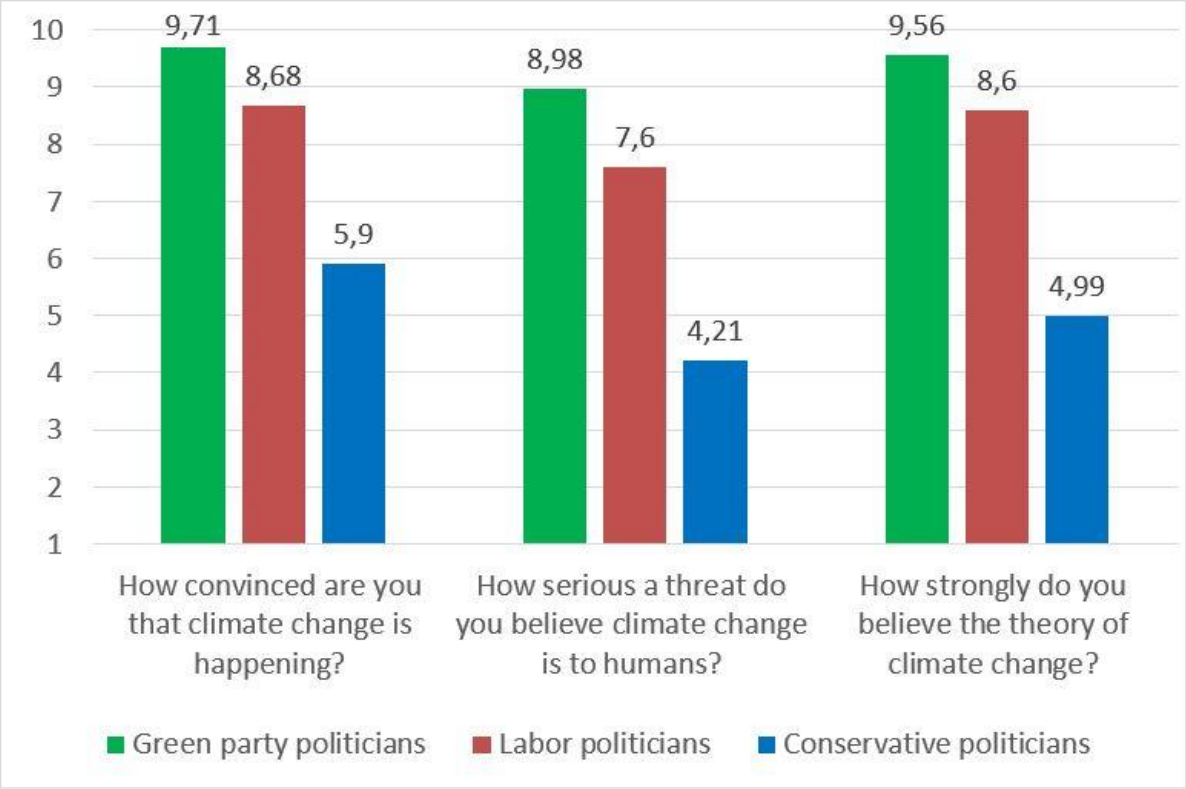
Figure 8 : Thinking of oneself as a group member leads to internalizaton of ingroup norms

4.3 The influence of social identities on environmental attitudes and behaviour

There has been an increasing focus on understanding how social identities influence environmental attitudes and behaviours (see Fielding & Hornsey, 2016; Fritsche**,** Barth, Jugert, Masson, & Reese, 2018). Probably the clearest evidence of this influence is the link between political identity and climate change beliefs. A meta-analysis (i.e., a statistical synthesis of existing studies) of the research on climate change beliefs shows that political affiliation is one of the strongest predictors of whether people believe in climate change: people who are aligned with left wing progressive political parties are more likely to believe in climate change than those who are aligned with right wing conservative parties (Hornsey, Harris, Bain & Fielding, 2016). A study that surveyed Australian politicians also showed evidence of the stark divide between political progressives and conservatives at the elite level (Fielding, Head, Laffan, Western, & Hoegh-Guldberg, 2012). Politicians who were members of the Greens and Labor party (a centre left political party) were much more likely than those who were members of the Liberal or National party (conservatives political parties) to be convinced that climate change is happening, to believe in the theory of climate change, and to believe that climate change poses a serious threat to humans (see Figure 9).

Another study also showed that beliefs about climate change are malleable and change according to whether people are thinking of themselves in terms of their political identity (Unsworth & Fielding, 2014). When the study procedures made participants think of themselves in terms of their conservative political identity, they believed that humans made

less of a contribution to climate change than when the procedures did not bring their conservative political identity to the fore. In other words, participants‘ political identity changed the way they think about climate change.



Note. 1 = not convinced at all/not at all serious/don’t believe at all, 10 = completely convinced/threatens human’s survival on the planet/completely convinced

Figure 9 : Climate change beliefs broken down across political party of the politicians

4.4 Social identities influence attitudes and behaviour via norms

The reason that social identities influence environmental attitudes and behaviour is because they provide a set of explicit and implicit rules and expectations (i.e., norms) about our attitudes and actions. There is ample evidence that social norms are an important influence on environmental behaviour. The meta-analysis of enviornmental behaviour studies by Klöckner (2013) showed that social norms predict environmental behaviour intentions (which in turn predicts actual behaviour). For example, the more farmers perceived that other farmers are engaging in sustainable land management, the more they intended to do the same (Fielding, Terry, Masser & Hogg, 2008, Study 1). Similarly, sending messages that communicate positive environmental ingroup norms, e.g., that a majority of group members are reusing their hotel towels (Goldstein et all., 2008) or that a majority of residents are saving energy (Nolan et al., 2008), promotes these behaviours amongst group members.

We are all members of a range of social groups, though, which raises the possibility that these groups may have different and conflicting environmental norms. What happens, for example, if our family are committed environmentalists but our work colleagues are not? Sometimes knowing that there is conflict between our different groups in their environmental behaviour spurs us to do more, for example, to save more water (McDonald, Fielding, & Louis, 2014). At other times it demotivates us (McDonald, Fielding, & Louis, 2013). The key

to whether it motivates us or not is how much we care about environmental issues: for those who have less interest in environmental issues norm conflict is demotivating, because it suggests that environmental behaviour is not effective (McDonald et al., 2013).

The social identity approach also tells us that ingroup norms will be more influential for those group members who are highly identified with the group. As an example, and particularly relevant for nature conservation work, farmers‘ intentions to sustainably manage their stream banks was stronger when they perceived that other farmers in their community supported this behaviour, but only for those farmers who were more strongly identified with their local farmer group (Fielding et al., 2008, Study 2). The take home message is that when a social identity is important to us, the norms of that identity will be more front of mind (consciously or unconsciously), and will be more likely to guide our behaviour. This could explain why many of us, despite our concern for the environment, engage in behaviour that is harmful to the environment. For instance, decisions to engage in long distance flights (e.g., to attend a conference) might be made because our professional identity is central and important to us and it is the norms of that identity and not our environmental identity that guide travel decisions.

4.5 Implications for environment protection interventions and policies

I began by highlighting the urgency that thousands of scientists from around the world have about our looming environmental problems, an urgency not matched by decision-makers or the general populace. A consideration of the way that social identities guide our attitudes and behaviour can provide insights into the seeming lack of urgency outside the scientific community. From a social identity perspective, the opinions and behaviours of members of our groups act as cues for what we should think and do. For most people, the cues that we should be taking urgent action to protect the environment are not present. Although most people express some level of concern about climate change, this concern often doesn’t translate into action. There are a range of ways in which citizens could help to address environmental problems: through changing their behaviours to conserve resources, through their consumer choices, through volunteer environmental conservation work, and through formal (e.g., supporting and donating to environmental groups) and informal (e.g., talking to friends and family) environmental advocacy.

At present we live in societies where a majority of people are not engaging in these behaviours, or are only engaging in a small subset of them. Clearly for us to move toward a sustainable way of living, environmental protection needs to be the norm and to engage in behaviours that do not protect and sustain our environment should seem wrong and even surprising or shocking. Let me illustrate using the recent millennium drought in south east Queensland, the region where I live in Australia. The drought was the worst in recorded history and reservoir levels fell to below 20%. A range of strategies were implemented to reduce household demand for water including information campaigns, restrictions, rebates for water efficient appliances, and a community goal of using 140 litres per person per day (Walton & Hume, 2011). The combination of these strategies and the immediate experience of drought shifted the water-related attitudes, values, and behaviour (i.e., the norms) of the community so that some years later when one of my colleagues announced that she had bought a sprinkler to water her grass, her announcement was met with a collective gasp from other colleagues.

Regulation and legislation would be the fastest and most efficient way to shift norms but there is often a lack of political will for mandated approaches to environmental protection outside of times of crisis. The social identity approach provides some suggestions for how we can link environmental protection to social identities and make environmental protection ingroup normative (for more detailed discussions see Fielding & Hornsey, 2016; Fritsche et al., 2018).

4.5.1 Use ingroup sources to deliver messages about environmental protection

Ingroup members are perceived to be more trustworthy and credible and therefore messages delivered by them should be more influential. For example, messages about sustainable land management could be delivered by farmers, and messages about climate change action could be delivered by political conservatives.

4.5.2 Link social identities and environmental outcomes

If a group is seen to have pro-environmental norms, then group members will conform to the pro-environmental norms of the group. Therefore, there is benefit to people identifying with pro-environmental groups or identifying with groups where the environmental protection credentials of the group could be showcased. For example, activating identification with a community that has developed water-saving norms could result in community members engaging in ongoing water conservation.

4.5.3 Promote pro-environmental ingroup norms

Research and theory suggests the importance of providing messages that develop and reinforce ingroup norms that foster environmental protection. Providing information that a majority of group members are engaging in environmental protection behaviours (e.g., saving energy) is a proven strategy. However, if a majority of group members aren't engaging in the behaviour then it is important to highlight that group members approve of environmental protection actions. Recent research has also shown that providing information that the environmental behaviour (e.g., reducing meat consumption) is a growing trend can be an effective strategy for promoting pro-environmental norms (Sparkman & Walton, 2018). Perceiving that the ingroup has pro-environmental norms can also be achieved by comparing the ingroup with outgroups perceived to be less environmental. Rabinovich and colleagues (Rabinovich, Morton, Postmes, & Verplanken, 2012) used this strategy with British participants who perceived more positive environmental ingroup norms when they compared British people to Americans than when they compared British people to Swedish people. Finally, leaders can change ingroup norms through advancing a vision for the group that entails protecting the environment (cf. Seyranian, 2014).

There are no simple solutions to our environmental crisis but the Alliance of Scientists (Ripple et al., 2017) who issued the warning to humanity argue that there is a need for grass-roots action by scientists, media influencers, and citizens to pressure politicians and decision-makers to 'do the right thing'. We need to move from a small segment of committed individuals and groups engaging in environmental protection and environmental advocacy to broad-scale action from all sectors of society. The strategies outlined in this paper are just some suggestions for how we could move in that direction.

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5 Environmental art is a promising tool for environmental education

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Abstract

Environmental art is a promising environmental communication strategy (Roosen, Klöckner & Swim, 2017), as it combines a more sensory, personal and emotional approach compared to classical informational strategies, which rarely lead to behavioral change (Steg & Vlek, 2009). This study examines an environmental art workshop considering several psychological variables. In the course of the intervention four environmental artworks were presented. Creative hands-on exercises were implemented to deepen the multisensory emotional experience. Statistical analyses suggest that the intervention strengthened the participants' pro-environmental attitude and sense of responsibility. However, further psychological research on environmental art needs to be carried out to assess the specific mechanisms of action.

5.1 Introduction

How can environmental problems be communicated in order to, ultimately, bring about behavioural change? This question is crucial in our contemporary, unsustainable society. Environmental protection actions often rely on the provision of problem knowledge (Hamann, Baumann & Löschinger, 2016). However, Steg and Vlek (2009) show that pure information campaigns rarely lead to behavioural change. One reason for an insufficient behaviour change lies in the psychological distance of environmental problems as their harmful consequences are not perceived to "occur soon, for sure, or necessarily to them as individuals" (Carmi & Kimhi, 2015, p. 2251). Roosen, Klöckner and Swim (2017) propose environmental art as an adequate medium of environmental communication, since it makes environmental problems, even if they are distant in time and space, experienceable in the present in a multisensory and emotional way. According to Goehler (2012, p. 11), the "potential of the arts [...] is used far too little for the necessity of sustainable action".

The presented study examines an environmental art workshop considering several psychological variables applied to environmental behaviour: problem awareness, sense of responsibility, personal norm, attitude, perceived behavioural control, social norm, behavioural intention, and connectedness to nature. The selection of factors is based on the *comprehensive action determination model* (Klöckner & Blöbaum, 2010). The empirically confirmed and in environmental psychology widely applied model explains pro-environmental behaviour (Klöckner, 2013).

The examined sample consists of adolescents. They are, according to the Conference of Education Ministers and the German UNESCO Commission, a relevant group to encourage pro-environmental behaviour (KMK & DUK, 2007). Adolescents need to train the required competences and adjust their attitudes for a future sustainable development (UNESCO, 2014). The environmental art workshop can also be understood as an approach to Education for Sustainable Development (ESD) as it was conducted in the educational context and follows several recommendations for ESD, such as the development of emotional

competences in the context of sustainability (Gugerli-Dolder, Elsässer & Frischknecht-Tobler, 2013) and the inclusion of sensory experiences (Stoltenberg, 2005).

5.2 Environmental art as a form of environmental communication

Environmental art can change the perception of environmental problems, enabling the experience of possible future scenarios (Nurmis, 2016). It can address various senses such as seeing, hearing, smelling, tasting and touching, which can give rise to emotions (Bullot, 2014). Since visual arts often exceed given conventions (Nurmis, 2016), surprising and, therefore, memorable experiences are enabled. The sometimes unusual appearance of environmental art rises the viewer's attention, which may serve as a starting point for further interest (Roosen et al., 2017).

Dunaway (2009) stresses that environmental art can evoke both, pleasant and unpleasant emotions. Pleasant emotions are often reported in connection with environmental art that works with positive visions of the future or is perceived as inspiring (Roosen et al., 2017). Pleasant emotions improve the conditions for creativity and openness (Harré, 2011). Unpleasant emotions can arise when loss, destruction or pollution is addressed (Randall, 2009). Among those unpleasant emotions, guilt, shame and fear (Dunaway, 2009), but also sadness, anger and rage (Randall, 2009) are often referred to. For persons who have only little knowledge of an environmental problem, unpleasant emotions can help to develop their problem awareness (Hamann et al., 2016).

According to Doyle (2011), good environmental art should not contain an explicit and obvious message, but encourage the viewer to reflect and interpret actively. Thus, there are reservations about a certain type of art that tries to influence too directly and obviously (Nurmis, 2016). When people feel, that their freedom of choice is restricted, unpleasant feelings of resistance can arouse (Miron & Brehm, 2006).

5.3 Environmental art workshop

This study examines a self-developed workshop, in which four environmental works of art were presented and which contained two creative exercises. The workshop had a length of six hours and was conducted at three grammar schools with pupils of the 10th grade. Two sculptures address the problem of plastic waste in the oceans (Figure 10), which represents a relevant environmental problem (Umweltbundesamt, 2015). Two further works of art were selected, which deal with the similarity of structures of the human body with structures in nature (Figure 11). The works of art were presented in the original, whereby two sculptures could be touched to enable a multisensory experience (Figure 11). The focus of the workshop was put on the personal and emotional involvement of the participants. As an introduction, the first work of art (Figure 10) was presented and the adolescents were encouraged to reflect on it. Contextual information on the creation of the artwork was provided. It included the imparting of problem knowledge about microplastics in the sea. In addition, action alternatives were presented on how plastic can be avoided in everyday life.

The first creative exercise consisted of choosing an animal (seal, turtle, dolphin), which is affected by microplastics, and to model its stomach with clay. The creative forming process ought to enable a personal and emotional connection to an animal. Additionally, an imaginative exercise was carried out to reinforce empathy: While touching their modelled stomach, participants imagined swimming through the sea as the chosen animal. In the second creative exercise, the adolescents were asked to discover similarities between landscape structures and corporeal structures. They were invited to imagine details of their own bodies, such as the palm of their hand or the cavity under their sole, as a landscape structure. This envisioned landscape could now be creatively designed either with clay as a sculpture or with crayons as a drawing. This exercise aimed to strengthen their connectedness to nature. Finally, the adolescents were encouraged to share their experiences and formulate their intentions for pro-environmental behaviour in the future.

Figure 10: „Pegwell Bay“, 2017, J. Sagert

5.4 Results

Before and after the workshop participants were asked to fill out questionnaires about the psychological variables of the above-mentioned *comprehensive action determination model* (Klöckner & Blöbaum, 2010). Their answers were statistically compared to the answers of a control group, which completed the same questionnaires. In the control group participants received an information flyer about plastic waste. After the workshop, pro-environmental attitude and sense of responsibility were significantly higher in the intervention group compared to the control group. This difference was not found before the workshop. These findings suggest an effect of the intervention on pro-environmental attitude and sense of responsibility. However, the results need to be interpreted with caution as there are several methodological limitations.

Figure 11 : „Monte Mano“, 2016, J. Sagert

Participants' written feedback contains indications of how environmental art is perceived. The application of artistic and creative methods to ecological topics was praised several times: "I liked working with clay because it made the connection between body and nature very vivid" and "Our view of nature was greatly broadened. I approached this topic in a completely different way, which I liked". One statement can be interpreted as an insight into one's own connectedness to nature: "[…] I never noticed that places on our body look like landscapes". The visualization of environmental problems through art was mentioned in a causal link with a concrete behavioural intention: "I try to make sure that I do not pollute the environment by paying attention to small things. For example, I won't throw chewing gum, etc. into nature anymore, because the sculpture has shown me very clearly that far too much garbage ends up in the sea."

5.5 Implications for environmental protection interventions and policies

As the quantitative analysis suggests an intervention effect on pro-environmental attitude as well as on sense of responsibility, it can be recommended as a promising approach for educational settings. The written feedback underlines the qualities of environmental art. It has to be noted that the presentation of the artworks was embedded in a workshop setting with several other components such as knowledge transfer, creative and imaginative exercises and sharing experiences with the group. All these components may have contributed to the intervention effect, which has to be considered for the design of further environmental art interventions.

However, if interventions about the same topic are designed for similar target groups, the intervention ought to focus more on connectedness to nature and the behavioral intentions than on problem knowledge, attitude and sense of responsibility, as the last three variables scored already high before the intervention.

As this study was able only to examine one specific approach within environmental art, further research is needed to identify which kinds of environmental art influence which psychological variables. What are the mechanisms of action of environmental art compared to other means of communication? For which target group environmental art is specifically powerful? Should participants work creatively on environmental topics themselves or is it enough to look at artworks?

The indication of the intervention effect on pro-environmental attitude and on sense of responsibility reflects the promising potential of environmental art for environmental education and environmental communication in the future. For a precise workshop description or further questions please contact the author.

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6 Denial, rationalization, and suppression – How our basic psychological needs may influence why we do not act in the face of climate change

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Abstract

In times of increasing global temperatures and apathy in the face of climatic and social crises, understanding why people do or do not act is critical. Despite high pro-environmental attitudes, most people ignore the reality of climate change in their everyday lives (Moser & Kleinhückelkotten, 2017). This may be a sign for internal conflict and attempts to protect the self from threat (Norgaard, 2011; Stich & Wagner, 2012). Self-Determination Theory (Deci & Ryan, 2000) assumes the basic psychological needs for relatedness, competence, and autonomy to be essential for psychological functioning and our ability to face threatening information. Promoting the satisfaction of the basic psychological needs for relatedness, competence, and autonomy has also been found to foster intrinsic and autonomous motivation for pro-environmental behavior, behavior that is direly needed in the transition to a socially and ecologically just society (Cooke, Fielding, & Louis, 2016; Darner, 2009; Kaplan & Madjar, 2015; Kasser, 2009). This work aims to investigate the associations between satisfaction of basic psychological needs, self-protective strategies, and pro-environmental behavior. A long-term objective of this work is to develop effective interventions, which render the use of self-protective strategies redundant. Such interventions could aid people in facing threatening information and, thus, foster intrinsic motivation for pro-environmental behavior, taking basic need satisfaction into account, in times in which social-ecological change is urgently needed. In this short report, however, preliminary results of two first studies will be presented and implications for practitioners in the field will be explored.

6.1 The majority of people ignores climate change in their everyday lives

By now, the consequences of climate change can also be observed and felt in Germany and the Global North. High temperature extreme weather events are becoming more common, mean sea levels are rising, and this year we experienced record high temperatures, drought, and wildfires across Europe. Nevertheless, we as a collective that already experiences the consequences of climate change fail to act[1] (Global Carbon Project, 2017). In line, sustainable attitudes and intentions on the level of the individual are often not accompanied by appropriate environmentally friendly decisions. This may indicate inner conflicts, for instance conflicts between values, short- and long-term goals, attitudes or behavior, or lack of psychological resources to deal with threat proactively. Those factors may facilitate the

[1]In 2017, European CO2-emissions were only reduced by 0.2%, while more drastic reductions are needed to avoid a 1.5° global warming (Global Carbon Project, 2017).

use of defensive, self-protective strategies in the face of climate change and may lead to the absence of appropriate pro-environmental behavior (Stich & Wagner, 2012).

Given the urgency of the described circumstances, I am pursuing this work in order to contribute to a better understanding of psychological barriers to pro-environmental behavior (PEB). We know very little about how people meet such above described inner conflicts and in particular how psychological factors, such as the satisfaction of needs, influences the solution of such conflicts. Therefore, I investigate to what extent basic psychological needs influence self-protective strategies (used as a consequence of inner conflicts) and PEB. Basic psychological needs are fundamental needs that are essential for psychological health and human functioning, while self-protective strategies are strategies used to protect the self from threat, maintaining positive self-esteem. This work focuses on privileged people, i.e. people in the Global North that have sufficient financial and material means to be actively engaged in PEB. They can be characterized by a paradox: on average they are highly motivated to act in favor of the climate (e.g. Environmental Awareness Studies, BMUB & UBA, 2017) but simultaneously ignore climate change in their everyday lives, advance it, or at least do not act environmentally friendly (see Moser & Kleinhückelkotten, 2018). Ignoring climate change and/or the corresponding necessity to act sustainably can be interpreted as such a self-protective strategy in this context.

6.2 Why we need to focus on people's basic psychological needs

Common and frequently cited explanation models of PEB (e.g. Theory of Planned Behavior, Ajzen, 1985; Norm-Activation-Model, Schwartz, 1977, Schwartz & Howard, 1981; Value-Belief-Norm-Theory, Stern, 2000) focus on empirically accessible variables such as problem awareness or environmental norms, while the study of underlying factors (e.g. basic psychological needs) often remains secondary. Need-based explanations are central to understanding human behavior with regards to climate change because awareness of climate change can lead to potentially traumatic feelings of powerlessness, helplessness, hopelessness, frustration, fear, and guilt (e.g. White, 2015), can threaten individual and collective identity (Crompton & Kasser, 2009), and can trigger fear of losing ontological security (Norgaard, 2011). The satisfaction of basic psychological needs plays a central role because it is indispensable for psychological well-being, healthy human functioning, and our ability to deal with threat proactively (Deci & Ryan, 2000). Indeed, some studies show that the satisfaction of basic psychological needs for relatedness, autonomy, and competence is associated with more intrinsic motivation for PEB (e.g. Cooke, Fielding, & Louis, 2016; Kasser, 2009).

6.2.1 Basic psychological needs and PEB

Research to date that has found an association between the satisfaction of basic psychological needs and PEB has mainly focused on Self-Determination Theory (SDT, Deci & Ryan, 2000). SDT as a theory of human motivation assumes the universal, innate basic psychological needs for autonomy (voluntariness and freedom of choice), relatedness (love and attachment, belonging, community), and competence (experience of oneself as an effective agent; experiencing a sense of capability in realizing plans, aspirations, and goals) as indispensable building blocks for healthy human functioning. That includes the ability to

deal proactively with potentially threatening information. Sheldon, Wineland, Osin, and Venhoeven (2016) found that the satisfaction of basic psychological needs buffers stress and thus enables people to cope proactively. Coping is to be understood as all the efforts of a person to deal with a burdening, perhaps even overwhelming situation. Experimental research further shows that the satisfaction of the need for competence allows people to react to threats constructively, without using defensive, self-protective strategies such as rationalization or denial (Greenaway, Louis, Hornsey, & Jones, 2014).

SDT posits that people naturally follow their intrinsic motivations meaning that actions are performed for their own sake because they have been internalized within the sense of self. Further, people only have self-determined motivation when *all* their basic needs have been satisfied. The frustration of basic psychological needs refers to the non-satisfaction of basic needs. For instance, this may occur because of an inadequate social environment or due to societal forces. In the long term, frustration can lead to diminished motivation or to the development of self-protective mechanisms, substitutive needs or self-destructive actions or apathy (Deci & Ryan, 2000).

There are first findings within the domain of PEB as well: The satisfaction of basic psychological needs is associated with more PEB in general and PEB that is rather difficult (Cooke, Fielding & Louis, 2016; Darner, 2009; Kasser, 2009). Furthermore, it mediates the relation between well-being and PEB (Wray-Lake, DeHaan, Shubert, & Ryan, 2017). For instance, high-school students in a collectivist-hierarchical society in Israel had more autonomous motivation for PEB (e.g. cleaning-behaviors, activism, and preserving behaviors), when their needs for relatedness and competence were encouraged in a school program (Kaplan & Madjar, 2015). Evidence for further relations between the satisfaction of basic psychological needs and PEB is provided by studies that show that self-determined motivation is associated with more PEB (Lavergne, Sharp, Pelletier, & Holtby, 2010; Pelletier, Dion, Tuson, & Green-Demers, 1999; Villacorta, Koestner, & Lekes, 2003), more perseverance, especially for difficult and uncomfortable PEB (Aitken, Pelletier, & Baxter, 2016; Cooke, Fielding, & Louis 2016; Green-Demers, Pelletier, & Menard 1997), and more stable environmental attitudes (Villacorta, Koestner, & Lekes, 2003; see Cooke, Fielding, & Louis, 2016 for a similar summary). Materialistic and self-enhancing goals (that indicate frustration of needs), however, are associated with less PEB (Kasser, 2009).

As outlined above, the satisfaction of the basic psychological needs goes hand in hand with PEB. Intrinsic motivation for PEB can be fostered through the satisfaction of basic psychological needs. Experiencing competence, autonomy, and especially relatedness seems important to counteract the lack of PEB. A focus on basic psychological needs is, thus, of particular interest because it promises theoretical, as well as practical advancements of psychological research in the environmental domain and the development of interventions for environmental protection in the long term.

6.2.2 When those needs are frustrated – self-protective strategies in the face of climate change

By implication, the *frustration* of basic psychological needs is associated with a lack of or reduced PEB (see Figure 12 for a working model of the proposed relations). Given that a large amount of people does not act pro-environmentally most of the time, these findings

may indicate that those people's basic psychological needs may not be sufficiently satisfied in the environmental domain to proactively engage with climate change. When basic psychological needs are frustrated, threats such as threatening information about climate change are often not met proactively. Instead, defensive, self-protective strategies emerge to protect the self from threat and corresponding emotions (Deci & Ryan, 2000; Stich & Wagner, 2012).

Self-protective strategies are used as a reaction to threat and serve to protect the self from painful emotions and to maintain positive self-esteem. They are found in all researched cultures and reflect underlying basic needs (Sedikides, Gaertner, & Cai, 2015). Self-protective strategies, thus, present an attempt to deal with inner conflicts. Depending on how these conflicts are perceived, different strategies are used (Stich & Wagner, 2012). Usually, those are defensive strategies such as self-serving denial or rationalization, which are triggered by threats to the self or to self-esteem (Hepper, Gramzow, & Sedikides, 2010). One example for a defensive strategy is self-serving denial. Self-serving denial can be defined as a behavioral and cognitive strategy used to avoid the painful consequences of a stressor. Denial, thus, serves to maintain positive self-esteem. However, denial does not only refer to the denial of facts in a literal sense but can also be understood as awareness that is not translated into social action or is not integrated in everyday life (Norgaard, 2011). Not the information per se is denied but its psychological, political, and moral consequences and implications. With respect to climate change a widespread lack of urgently needed PEB in everyday life can be observed, while the problem and its solution are well known. Accordingly, we can observe that people are tempted to reduce their feelings of moral obligation to act against climate change through self-serving denial, especially when PEB is difficult, uncomfortable, or associated with high costs (Lindenberg & Steg, 2007; Schwartz & Howard, 1981).

Drawing on the theoretical considerations that have been outlined, I propose the following relations (see Figure 12): The satisfaction of basic psychological needs prevents defensive, self-protective strategies from occurring because it allows people to face threatening information and to deal with it proactively. The frustration of basic psychological needs is associated with a lack of psychological resources to deal with threat, which leads to the use of defensive, self-protective strategies because threatening information cannot be dealt with proactively. In the following sections, I introduce two first studies that I have conducted to test those hypotheses.

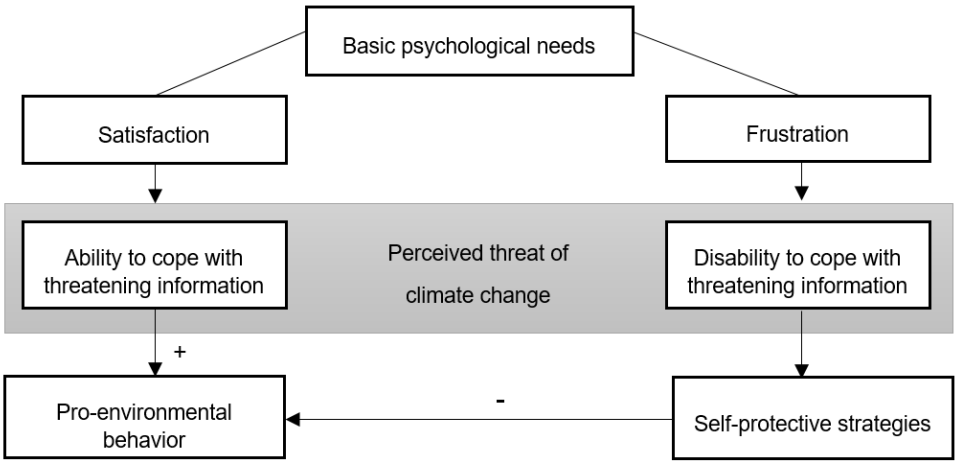

Figure 12: Working model on the influence of basic psychological needs on self-protective strategies in the face of climate change. The satisfaction of basic psychological needs leads to more pro-environmental behavior (left), while the frustration of those needs leads to self-protective strategies (right) and, therefore, less pro-environmental behavior. The satisfaction of basic psychological needs, thus, influences how threatening information is dealt with. (Wullenkord & Reese, unpublished)

6.3 The current studies

Two studies were conducted to test the hypothesized model and presented briefly in the following sections.

6.3.1 Pilot Study

The aim of a pilot study was to construct a questionnaire, which assesses self-protective strategies that are commonly used to deal with climate change. To this end, I reviewed the existing literature on defense mechanisms, self-protective strategies, and coping in the environmental domain. I then created a pool of 99 items based on theoretical considerations of Opotow and Weiss (2000); interviews by Stich and Wagner (2012), Norgaard (2011), and Ojala (2012); items by Sparks, Jessop, Chapman, and Holmes (2010) and Homburg, Stolberg and Wagner (2007); and own considerations. The items were phrased as statements that participants indicated their amount of agreement with, based on a 7-point Likert scale (1 = completely disagree, 7 = completely agree).

Participants (N = 354) filled in an online survey, consisting of the item pool, a measure for PEB (General Ecological Behavior Scale, Kaiser & Wilson, 2004; own items), and several control and background variables (gender, age, income, education, political orientation, environmental awareness). As a thank-you for their participation, participants had the opportunity to take part in a raffle for money that they could choose to keep for themselves or to donate to an environmental organization. This donation behavior was recorded to obtain a more direct estimation of PEB.

To reduce the amount of items in the Environmental Self-Protection scale, an exploratory factor analysis was run. A seven-factor structure described the data well. The final questionnaire consisted of 40 items, assessing the following self-protective strategies: *Rationalization*, *avoidance and suppression*, *denial of global outcome severity*, *denial of*

personal outcome severity, *trivialization*, *denial of guilt*, *denial of responsibility*. Reliability indicators were excellent both for the overall measure, as well as for the individual subscales.

Correlation analyses revealed a strong negative correlation of the entire measure and all its subscales with PEB, indicating divergent validity of the scale. While there were no overall associations of self-protection with age or income, interestingly, older and wealthier people tended to engage more in *Denial of Guilt* than younger people and those with less income. Furthermore, people who identified as more right-wing also reported using more self-protective strategies overall and with regards to all individual strategies and reported engaging in less PEB.

In a multiple regression model, PEB could be predicted using the overall scale, over and above the influence of background variables such as age, income, or political orientation. Especially the subscales *Trivialization* and *Denial of Responsibility* had high explanatory power.

6.3.2 Main study

The objective of the main study was to investigate the predicted associations between satisfaction of basic psychological needs, self-protective strategies, and PEB.

A battery of constructs was assessed in an online survey, in which N = 453 people participated: General need satisfaction and frustration (Balanced Measure of Psychological Needs Scale, Sheldon & Hilpert, 2012; German translation: Neubauer & Voss, 2016), context-specific need satisfaction and frustration (Balanced Measure of Psychological Needs Scale – own adaptation for the environmental context), self-protective strategies (Self-Protection Scale, pilot study), PEB (General Ecological Behavior Scale, Kaiser & Wilson, 2004, own items, donation behavior as in pilot study), and control and socio-demographic variables.

Preliminary analyses of this work reveal partial support for the hypothesized model (Figure 12). Firstly, this study replicated the findings of the pilot study. It revealed strong associations of the reported use of self-protective strategies with both private and public PEB. Secondly, the data showed significant associations of overall need satisfaction with private but not public PEB and significant negative associations with self-protective strategies. However, no associations with overall need frustration were found. Context-specific need satisfaction was both positively associated with private and public PEB and strongly negatively related to the reported use of self-protective strategies. The frustration of needs in the environmental domain seemed unrelated to PEB, but a medium relation to self-protective strategies was revealed.

6.4 Results in a nutshell

Examining why people do not act in the face of climate change, despite high knowledge about the problem and positive pro-environmental attitudes, is critical. This research explores relations with basic psychological needs to better understand the use of defensive, self-protective strategies in the face of climate change. Preliminary analyses of the data reveal partial support for the hypothesized model (Figure 12). When needs were satisfied in the environmental domain, i.e. when people reported feeling a sense of relatedness, autonomy,

and agency when performing their recent pro-environmental actions, people also reported engaging in more PEB than if those needs were not satisfied. Even though the relation was weaker, people also reported engaging in more PEB when they experienced a sense of relatedness, competence, and autonomy in their overall life, irrespective of the environmental context. This is particularly interesting, as it points to the importance and relevance of overall need satisfaction to engage with a specific crisis, which seems unrelated to general qualities of the human psyche. Even though such a relation would be expected from analyzing the theory and existing empirical papers, it has not yet been reported in the literature, to my knowledge.

Both studies demonstrated that the use of self-protective strategies, such as rationalizing climate change, ignoring its implications in everyday life, or denying one's responsibility for it was opposed to behaving in a pro-environmental manner. Furthermore, it was found that the more people's needs for relatedness, autonomy, and competence were satisfied, both overall and in the specific context of the environment, people also reported using less self-protective strategies. Again, overall satisfaction of needs predicted the use of self-protective strategies in a very specific context. This result underlines the importance of overall need satisfaction for engaging with specific threats.

6.5 Implications for environment protection interventions and policies

Based on the existing research on the connection between basic psychological needs and PEB and the presented preliminary findings (even though some caution needs to be taken when interpreting them, due to their preliminary nature), some conclusions can be drawn for practitioners in the field:

Firstly, interventions that are designed to foster intrinsic motivation for PEB need to take the satisfaction of basic psychological needs into account. Perhaps practitioners can ask themselves a few questions when working with clients or designing campaigns, to make sure that need satisfaction is considered. Here are some examples:

Autonomy: Are people free to choose what they want to do and are not forced or pressured into doing? Do people understand the meaning behind the campaign or intervention and are able to make an informed choice for themselves?

Competence: Does the target group feel they are able to do what is asked of them? Does the intervention present an optimal level of challenge and is neither too easy, nor too difficult?

Relatedness: Will people experience a sense of belonging to the group, their community, friends or family? Are people able to connect with others and will not experience social exclusion as a result of their actions? Is the overall tone warm and respectful?

Secondly, even though the specific context of the environment matters, my work also points to the relevance of *overall* need satisfaction, irrespective of the specific context. Thus, the satisfaction of needs on a broader, perhaps more societal level seems indicative. Ultimately, this should not be surprising, as the overall satisfaction of basic psychological needs is necessary for psychological health and healthy human functioning in various domains and, thus, for the ability to proactively deal with threatening information such as the climate change. In the field, making a specific recommendation is difficult. Nevertheless, seeing beyond the immediate context of the intervention or campaign, recognizing broader societal

implications for the ability of people to satisfy their basic needs, and realizing the importance for overall need satisfaction, which may seem unrelated at first glance, are important.

Lastly, interventions and recommendations need to be used in tandem with a variety of validated interventions. A useful approach next to other strategies may be to firstly, foster satisfaction of basic psychological needs, especially (but not only) in those contexts that are of relevance. Second, question why people do not engage with the problem and consider whether there are underlying issues regarding need satisfaction or lack thereof that can be resolved to enable people to better work for a better world.

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7 Think Global, Garden Local! – Effects of Virtual School Garden Exchange

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Abstract

Virtual School Garden Exchange (VSGE) is the virtual international networking of learners with a focus on their school gardens and related issues using digital media like videos, photos or videoconferences. VSGE use the topic of school gardens to induce an exchange between learners. The exchange highlights parallels, provokes a process of reflection, supports intercultural learning, creates connectivity and imparts knowledge. This is an attempt to integrate and implement the global perspective of Education for Sustainable Development (ESD) in local school garden work. ESD aims to enable children, young people and adults to think and act in a sustainable manner. It puts people in a position to make decisions for the future and to estimate in which way their actions affect future generations or life elsewhere in the world. Such competences are in particular needed in a time which is shaped by global challenges.

Figure 13: Visualization of a Virtual School Garden Exchange

7.1 Coming from a different direction

We are living in a time of global challenges such as climate change, displacement and migration, loss of biodiversity, etc. Various scientific researches show that the current production and consumption patterns of the growing world population exceed the capacity of renewable resources of the planet (Crutzen & Stoermer, 2000; Hardin, 1968; Meadows, Meadows, Randers, & Behrens, 1972; Rockström et al., 2009). The question how to deal with it is probably the most important challenge of this generation. Virtual School Garden Exchange is an innovative educational tool that can be applied to foster learning processes related to a variety of topics relevant to sustainable development like hunger, health and

wellbeing, consumption and production, life on land etc. These topics are part of the 17 Sustainable Development Goals (SDGs) which belong to the 2030 Agenda, adopted by the UN in 2015. ESD is an essential part of the SDG 4 'quality education'. The target 4.7 states, that by 2030, "all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development" (UN, 2015, p. 21). VSGE as it is understood in this paper has lots of potentials to contribute to SDG 4. In my research I aim to find out, how the participation in a VSGE affects the learners.

The question how to mitigate global crisis is much discussed in different disciplines. My background is agricultural sciences with a focus on Education for Sustainable Development (ESD). The interdisciplinary exchange with environmental psychologists in the international summer school on environmental psychology in June 2018, showed me, that we are dealing with similar issues, but addressing them differently. It is enriching to look at these issues from different disciplinary perspectives.

7.2 Local gardening & Global exchanging!

School gardens are often part of school grounds or located in close proximity. They exist all around the world, have different shapes and sizes and different purposes such as learning, recreation or food production (FAO, 2010, p. 2; Milicevic & Nowikow, 2017, p. 2). However, school gardening often does not get much further than composting, although gardens offer many ways to address global challenges to learners (Richards, n. d., p. 3).

School gardens are ideal ESD learning locations (Schreiber & Siege, 2016): School gardens are a place for local action embedded in global issues: Crops growing in the garden, come from all over the world, climate affects the gardening, loss of biodiversity – like the dying of insects – gets tangible in the garden, different cuisines can be explored through the garden, etc. There are different organizations and initiatives with an emphasis on bringing such aspects in the school garden such as the Schools Global Gardens Network (SGGN, 2010), Ackerdemia e.V. with the educational program GemüseAckerdemie (Ackerdemia e.V., 2018), the International School Garden Forum (Spieler & Nowikow, 2006) and different school garden exchange programs (Lochner, 2016).

In a VSGE, learners from primary or secondary schools around the world who are engaged in school gardening can communicate in the virtual world about their garden experiences and related topics using media such as emails, photos, films, or video conferences (see Figure 13). The goal of a VSGE is to use the topic of school garden to enable an exchange between learners, which highlights parallels, provokes a process of reflection, supports intercultural learning, creates connectivity and imparts knowledge.

7.3 Global youth partnerships using digital media

The empowerment and mobilization of youth is one of five priority action areas of the Global Action Program on Education for Sustainable Development of UNESCO (United Nations Educational, Scientific and Cultural Organization), which seeks to generate and scale up concrete actions in Education for Sustainable Development (UNESCO, 2014). The Global

Action Program aims to contribute to the 2030 Agenda and in particular towards SDG 4. The necessity to work globally together is captured in the last of the SDGs: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development (UN, 2015). “Creating settings in which learners can deal with global sustainability topics and can communicate and collaborate with people from other countries can thus be seen as essential elements of ESD. However, few learning settings can be found that offer and stimulate an interactive dialogue between learners from the North and the South” (Barth & Rieckmann, 2008, p. 27).

Digital media offer learners from different countries opportunities to overcome geographical barriers to connect and engage with each other. They open up ways for the implementation of Education for Sustainable Development. It is a way to experience our globalized existence as learners (Schreiber, 2001, p. 176; Schreiber & Siege, 2016, p. 65). Therefore, the use of digital media is firmly anchored in the framework of Global Development Education (Schreiber & Siege, 2016, p. 65-71). Through the internet a quick and direct communication is possible, which can be part of school partnerships. VSGE (Lochner, 2016) draw on these advantages by direct linking.

7.4 Effects of Virtual School Garden Exchanges on the participants

As far as I know there is yet no research published on the effects of Virtual School Garden Exchanges on the participating learners. Do Virtual School Garden Exchanges really reach their intended goals of showing parallels, provoking a process of reflection, supporting intercultural learning, creating connectivity and imparting knowledge?

Bowker & Tearle (2007) suggest in their paper about a planned Virtual School Garden Exchange that it leads to an exchange of “knowledge, ideas and experience, and hence (learner) gain insight into other cultures and ways of life” (Bowker & Tearle, 2007, p. 84). "It could be that, as the global links grow and become more active, children can use their different perceptions and knowledge bases positively, and can begin to learn from each other via their shared focus of gardening and growing" (l.c., p.98).

A comparable argumentation can be found in the field of environmental psychology. Römpke (2017) writes in her article: “bringing people in contact with people in other countries will be a motivating factor to care more about the own influence on the wellbeing of people in other places; when it is not just the environment that is harmed, but at the same time a friend of mine” (Römpke, 2017, p. 21). She follows the theory of the contact hypothesis by Allport (1954), dealing with relations between groups. There are different ways how groups can get in contact, one “exceptionally promising” (Amichai-Hamburger & McKenna, 2006, p. 839) medium is the internet. “Groups that are segregated and/or geographically distant from each other” (l.c., p.827) can communicate easily via internet. A positive international contact might contribute towards a global identity. “Global identity reflects social identification with the world and the largest, most inclusive human ingroup and is generally associated with behavior that serves the world and all humans, such as transnational cooperation or pro-environmental engagement” (Renger & Reese, 2017, p. 1).

These approaches coming from the field of psychology have many parallels with the understanding of ESD and the concept of VSGE. ESD is expected to enable learners to estimate how their actions affect future generations or life elsewhere in the world, which is in

other words a “global responsible behavior” (Römpke, 2017). Does the participation in a VSGE contribute towards a global identity?

7.5 Current research

In my research I am addressing VSGE from different perspectives. Together with Robischon and Rieckmann, we carried out a systematic literature review which illuminates the scientific literature on school gardens from 1992 to 2018. The findings of the systematic literature review led us to conclude that no scientific literature – at least not fulfilling our conditions – has been published on the experiences gathered during the implementation of VSGE (Lochner, Rieckmann, & Robischon, forthcoming). Bowker and Tearle (2007) formulated some hypotheses in their paper, such as the assumption that ‘as the global links grow and become more active, children can use their different perceptions and knowledge bases positively, and can begin to learn from each other via their shared focus of gardening and growing’ (Bowker & Tearle, 2007, p. 98).

Future research shall address how the participation in a VSGE affects the learners. I will conduct qualitative expert interviews with teachers who have been engaged in a VSGE and are experts for learning processes of their learners. Furthermore, I will conduct group interviews with participating learners at the end of the exchange. So far, I was able to identify VSGE in different parts of the world.

I will try to be aware of perspectives on my field of subject coming from totally different disciplines, calling it maybe differently and having a different research approach. I see it as very enriching to have a look out of the box and maybe be able to understand a bit how other disciplines and people see my field of research.

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8 Measuring Pro-Environmental Behavior in the Laboratory

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Abstract

To counteract problems like climate change and environmental pollution, people need to change their behavior. Environmental psychologists are researching ways to promote pro-environmental behaviors (such as recycling or travelling by public transport). For this purpose, they need to be able to measure pro-environmental behavior. Most often, pro-environmental behavior is measured (a) by asking individuals to report how they behave or (b) by observing their behavior in the field. Unfortunately, self-reports are often distorted and field observations are not always practicable. This is why we designed a computer task to measure pro-environmental behavior in the laboratory. Here, we review data from two recent studies that we conducted to test the usefulness of this task. These data suggest that the task accurately measures what it is supposed to measure, that is, pro-environmental behavior. Based on these results, we recommend using this task to improve our understanding of pro-environmental behavior and to study new techniques to promote sustainable behavior change.

8.1 The Need to Measure Pro-Environmental Behavior

It is widely accepted that human behavior contributes substantially to many environmental problems including climate change, environmental pollution, and the loss of biodiversity (Stern, 1992; Swim, Clayton, & Howard, 2011; Wilson, 1988; Wynes & Nicholas, 2017). Addressing these problems requires understanding those human behaviors that have a negative impact on the environment. This knowledge can then be used to promote shifts towards more pro-environmental behavior (i.e., “behavior that harms the environment as little as possible, or even benefits the environment”, Steg & Vlek, 2009, p. 309).

A crucial prerequisite for this stream of research is the ability to measure pro-environmental behavior. A scientific understanding of a particular behavior can only be reached if this behavior can be measured. Similarly, the effectiveness of interventions can only be evaluated if assessment of the target behavior is possible. The question of how to measure pro-environmental behavior is thus highly relevant for everyone who wants to use the behavioral sciences to mitigate behavioral contributions to environmental problems.

8.2 Current Approaches to Measuring Pro-Environmental Behavior

Contemporary researchers mostly rely on self-report measures for the assessment of pro-environmental behavior (Steg & Vlek, 2009). They ask the individuals participating in their research to indicate how frequently they engage in pro-environmental behaviors in everyday life. This research practice is very efficient, but it is also associated with a number of obvious disadvantages (Gifford, 2014). People may not always recall how often they engaged in a particular behavior and they are likely to differ in their interpretation of questions and

response scales. In addition, self-report measures might overestimate the real frequency of pro-environmental behavior because of people giving answers that they consider socially desirable. Given these problems, it is not surprising that the correlation between self-reported pro-environmental behavior and actual pro-environmental behavior is not very strong (Kormos & Gifford, 2014).

Another disadvantage of self-report measures is that they seem to systematically discourage experimental research on pro-environmental behavior. When we (Lange, Steinke, & Dewitte, 2018) recently reviewed 26 studies that used self-report measures of pro-environmental behavior, we only found a single study that employed an experimental design (i.e., that compared pro-environmental behavior between an intervention group and a control group). The remaining studies were purely correlational in nature, that is, they examined the relationship between self-reported pro-environmental behavior and other (mostly self-reported) variables. Importantly, correlative studies do not allow to establish causal relationships or to test interventions that might help to promote pro-environmental behavior.

For this reason, pro-environmental behavior researchers often apply an alternative approach to the measurement of pro-environmental behavior: they study actual pro-environmental behavior in the field. In a typical field study, researchers directly observe some kind of pro-environmental behavior and compare the frequency or intensity of this behavior between people who have been exposed to an intervention and an unexposed control group (e.g., Hamann, Reese, Seewald, & Loeschinger, 2015). Despite their obvious appeal, field experimental studies on pro-environmental behavior suffer from critical methodological limitations as well. In most cases, it is hardly feasible to link behavioral observations to individual background data (e.g., regarding the demographics or personality traits of the participant) because field researchers cannot reliably track individual participants. In addition, it is often challenging to randomly assign participants to distinct conditions and to ensure that people in the control condition remain unexposed to the intervention. In other words, when studying pro-environmental behavior in the field, researchers often lack the degree of experimental control that would be necessary to establish conclusive cause-effect relationships.

8.3 An Alternative Approach to Measuring Pro-Environmental Behavior

It is the goal of our research program to regain this experimental control, that is, to study the effects of interventions on actual pro-environmental behavior under more controlled conditions. We argue that, as in other fields of science, this can best be done in the research laboratory. In the laboratory, we can systematically create situations in which participants can behave pro-environmentally or not and we can precisely control which participants receive which kind of intervention. We can also address more complex research questions that might be too costly to examine in field studies (e.g., Are informational campaigns more or less effective when they are paired with self-monitoring and feedback interventions? Which kinds of financial incentives are most effective?). In addition, it is easy to collect background data and to relate these to participants' pro-environmental behavior in the laboratory. By this means, it is possible to analyze whether an intervention is more effective for one subgroup of participants (e.g., male, extravert, or retired people) than for another.

Despite these advantages, actual (i.e., not self-reported) pro-environmental behavior is rarely studied in the laboratory. One of the reasons for this seems to be that there is no established laboratory measure of pro-environmental behavior. Researchers who want to measure pro-environmental behavior in the laboratory need to design their own measures. Results from these measures cannot be compared across studies and it is unclear to what extent they provide useful and accurate indicators of pro-environmental behavior. For this reason, we set out to develop, evaluate, and optimize an easy-to-use computer task that allows measuring pro-environmental behavior under controlled laboratory conditions.

Our task was created to meet a number of criteria that we considered essential for a useful measure of pro-environmental behavior. First, the task should function according to the same rules as those everyday situations in which people can behave pro-environmentally or not. In many of these everyday situations, people need to balance their own costs and benefits with those for the environment. When behaving pro-environmentally, people often incur some kind of personal cost (e.g., they need to pay more for organic food or to invest additional time in separating waste or commuting by public transport) to the benefit of the environment (Gifford, 2011; Lange, Brückner, Kröger, Beller, & Eggert, 2014; Steg, 2015). This conflict of personal and environmental consequences should also be reflected in a laboratory measure of pro-environmental behavior. Second, behavior on the task should be related to factors that are known to relate to pro-environmental behavior. This would be an indication that the task actually measures what it is supposed to measure. Third, the laboratory measure should be as accurate and reliable as possible. This can be achieved, for example, by repeatedly exposing participants to similar situations in which they can behave pro-environmentally or not. An aggregate measure that uses the information from all these situations is typically more accurate than a one-time measure. Next, we describe the task that we designed to meet these criteria.

8.4 The Pro-Environmental Behavior Task

On the pro-environmental behavior task (short: PEBT), research participants are asked to choose between two modes of transportation, the car and the bicycle, for a series of trips. The choice between these options relates to actual consequences for both the participant and the environment. When participants choose the bicycle option, they have to spend more time on the trip than when they choose the car option (i.e., the time that passes until they are presented with the next choice increases). However, choosing the car option also turns on a number of USB-powered lights under the desk of the participant, which wastes a small amount of energy. Figure 14 displays the task setup as well as parts of the choice display. Note that for each choice, participants are explicitly informed about a) the travel time by car, b) the travel time by bicycle, c) the travel-time difference between car and bicycle, d) the number of lights that are illuminated by choosing the car option, and e) the amount of CO_2 emissions produced by choosing the car option. Based on this information, participants can choose between one option that minimizes the time they spend in the laboratory (i.e., the car) and another option that minimizes the negative environmental impact of their choices (i.e., the bicycle). We consider the proportion of trips on which participants choose the bicycle option as a measure of pro-environmental behavior. To evaluate this measure (i.e., to test whether it fulfills the criteria listed above), we conducted two studies that we briefly describe in the following section.

Figure 14: The setup of the pro-environmental behavior task (PEBT). On this trial, the environmentally unfriendly car option had been chosen (see top left corner), which led to the illumination of twelve lights under the participant's desk. Figure reproduced with permission of Elsevier.

8.5 Testing the Pro-Environmental Behavior Task

In two studies, we (Lange et al., 2018) tested whether the proportion of bicycle choices on the PEBT qualifies as a good measure of pro-environmental behavior. First, we examined whether factors that should affect pro-environmental behavior also affected behavior on the PEBT. We found the car option to become less popular when it wastes a lot of energy or when it saves only a small amount of time. In other words, PEBT choices seem to depend on the personal costs and the environmental benefits associated with behaving pro-environmentally. Second, we tested whether variables that should relate to pro-environmental behavior also related to behavior on the PEBT. We found that people who reported to have more positive attitudes and values towards the environment, who are concerned about environmental change, and who identify themselves as environmentally friendly persons chose the bicycle more frequently on the PEBT. Finally, we analyzed whether people were consistent in their choices on the PEBT, that is, whether the same thing is measured on all PEBT trips. As we found this to be case, the proportion of bicycle choices on the PEBT can be considered to be accurate and reliable. All these results were very similar across the two studies, although we changed the labels of the two PEBT options in the second study. In this study, participants did not choose between the car and the bicycle,

but between options that were labelled with pseudowords (i.e., “SEST” and “DIFT”). This allowed us to conclude that behavior on the PEBT was not driven by any connotations participants might have with regard to the bicycle or the car, but rather by the actual consequences for the individual and the environment. In combination, these results suggest that the PEBT qualifies as a good measure of actual pro-environmental behavior in the laboratory.

8.6 Use of the Pro-Environmental Behavior Task

The current version of the PEBT can be freely downloaded at https://osf.io/tcnza/.We would like to encourage everyone who aims at understanding or promoting pro-environmental behavior to use this task and to adapt it to their purposes. None of the current features of the task are set in stone and we gladly provide assistance to everyone who seeks to modify the task.

8.7 Implications for Environment Protection Interventions and Policies

At first sight, the implications of this research program for practitioners in the field might not be obvious. First and foremost, our research was designed to stimulate advances in research on pro-environmental behavior. We presented the PEBT as a prerequisite and starting point for a thorough experimental analysis of pro-environmental behavior because we think that interventions and environmental policies should be based on such an analysis. Today, many pro-environmental behavior researchers attempt to study relationships between very broad constructs, to elucidate the psychological mechanisms underlying these relationships, and to do this in a way that has direct implications for the protection of the environment – and often all of this in one single study. We believe that this is not a very realistic expectation. If we want the behavioral sciences to produce new insights on how to promote pro-environmental behavior, we must not be afraid to encourage research on the seemingly unsexy details. This can imply that it is necessary to study a single small idea for years in the laboratory before translating it into conclusive field studies – just like extensive pre-clinical research is required prior to finding a promising new drug to test on human beings. Human behavior for the environment is unlikely to be less complex than human responses to medication. In the long run, we believe that acknowledging this complexity in the research we do and expect will lead to a more profound understanding of pro-environmental behavior and to the development of more potent intervention techniques.

8.8 Author note

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9 The influence of morality on private and political behavior involving a reduction in plastic use

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9.1 Abstract

People increasingly realize that plastic waste is a major environmental pollutant, and its ubiquitous use is evolving into a serious global problem that modern society must solve. Since consumption is located at the beginning of the waste chain, the reduction of plastic consumption must take priority. With the general public playing an influential role, we discuss major levers for human decision making and present the results of an online-survey for exploring the drivers of people's private and political behavior involving plastic packaging reduction. We propose that moral considerations and control beliefs may be useful in private and political interventions that target the reduction of plastic use.

9.1 Plastic pollution and public awareness

It has taken less than a century for plastic to capture the world, and it now seems that we cannot do without it in our daily lives. With an annual production of plastic of 330 million tons (PlasticsEurope, 2017), our era is often called the "Plastic Age" (Thompson, Swan, Moore, & vom Saal, 2009). Characteristics of this material such as its rigidity have made it so successful, resulting in enormous environmental problems due to its excessive use and consumption waste. Due to its long-lasting character, plastic is now found all over the world, in aquatic (e.g. Duis & Coors, 2016; Jambeck et al., 2015) as well as terrestrial environments (e.g. Bläsing & Amelung, 2018), and it affects wildlife as well as the human species.

Public awareness of the topic is rising, and political institutions now recognize that plastic pollution is a global problem. Recently, the European Commission adopted a strategy for plastics, followed by a directive to reduce single-use plastics (European Commission, 2018a, 2018b), thus highlighting the importance of the topic. General awareness of the problem in the public is expressed in concern about the negative consequences of plastics in the oceans (Hartley et al., 2018; UBA, 2017), but there is still a need for greater action (Betker, 2015).

9.2 Private and political behavior to reduce plastic pollution

Although the main characteristic of plastic is its durability, it is mostly used as a disposable product: 40% of the demand for plastic in Europe can be traced back to plastic packaging (PlasticsEurope, 2017), which indicates that consumer behavior is at the forefront of the problem. Compared with other European countries, Germany has one of the best recycling rates. But, on the other hand, Germany is at the top of the list where the demand for plastic is concerned: One quarter of all of the plastic consumption in Europe can be traced back to Germany (PlasticsEurope, 2017). Therefore, starting at the beginning of the waste chain with a focus on reduction behavior rather than recycling must take priority. Reducing plastic use or – more broadly – the reconsideration of resource-intensive practices is often called "sufficiency" and is accompanied by a rethinking of one's own lifestyle (Speck, 2016).

Stern's (2000) differentiation between three behavior patterns offers a useful foundation upon which the careful planning of campaigns and interventions can be based. All three behaviors refer to the public in general as a powerful subgroup of society: private behavior (e.g. buying food without plastic, or recycling household waste), activism (e.g. demonstrating in support of plastic-free care products), and (non-activist) policy support (e.g. stated approval of a deposit system or willingness to pay higher taxes for disposable packaging). This differentiation is necessary because all behaviors have different predictors as far as sociodemographic factors or psychological motivators (e.g. attitudes or norms) are concerned.

All three behaviors are meaningful drivers of a societal transformation regarding the challenge of plastic pollution. Because human behavior is the key, it is necessary to understand the factors that empower people and guide them toward making behavior changes (Duis & Coors, 2016). We discuss this approach briefly in the next paragraph.

9.3 Encouraging moral orientations to foster pro-environmental behavior

A prominent approach for explaining pro-environmental behavior is rooted in rational-choice theories (e.g. Little, 1991), by which humans are expected to evaluate different behavior options to find the best cost-benefit relation (e.g. less effort and most convenient). One frequently replicated theory in this context is the theory of planned behavior (TPB; Ajzen, 1991), by which deliberate behavior is predicted by weighing its consequences. However, in environmental contexts, people's behavior (e.g. buying plastic bags) does not always lead directly to negative consequences (e.g. dirty beaches), but the consequences are often delayed in time and space. Consequently, the impacts of a person's own behavior are not always visible. Moreover, acting in a pro-environmental manner (e.g. reducing plastic packaging) does not always mean a direct benefit and can be the less convenient alternative. Nevertheless, people do engage in pro-environmental behavior, and thus, motivators other than selfishness should be taken into account.

One driver is morality. Internalized morality can lead to altruistic behavior, a concern for the well-being of others. A prominent model that explains altruistic behavior is the Norm Activation Model (NAM; Schwartz, 1977), by which positive outcomes for others rather than for oneself are considered. During the last several decades, many studies have also provided empirical support for the NAM in different environmental domains (Black, Stern, & Elworth, 1985; Guagnano, Stern, & Dietz, 1995; Hopper & Nielsen, 1991; Vining & Ebreo, 1992), thus explaining environmental protection through a perceived moral obligation to act. This obligation, often called a personal (moral) norm, has a close link to people's values (Stern, 2000). Previous research has shown that self-transcendence values (e.g. caring about others) predict environmental concern (e.g. Schultz, 2001) and environmental involvement (Jia, Soucie, Alisat, Curtin, & Pratt, 2017). Self-enhancement (e.g. achievement or self-interest), on the other hand, has been found to be negatively associated with environmental actions (e.g. Jia et al., 2017; Nordlund & Garvill, 2002; Schultz et al., 2005). Apart from this classical differentiation, in particular, biospheric values (orientation toward nature) seem to be effective in encouraging environmental behavior (e.g. Bolderdijk, Steg, Geller, Lehman, & Postmes, 2012; De Groot & Steg, 2008) even when altruistic and biospheric goals are in conflict (De Groot & Steg, 2008).

These findings give rise to the question of what the mechanisms behind moral norms are. First, pro-social behavior creates positive emotions (Dunn, Aknin, & Norton, 2008; Mazar & Zhong, 2010), which means people feel good. This association is in line with people's aspirations to maintain a positive self-concept (Ariely, Bracha, & Meier, 2009; Mazar, Amir, & Ariely, 2008), preferring to be "green rather than greedy" (Bolderdijk et al., 2012, p. 1). In general, people seek consistency by ensuring that their actions are in line with their moral standards (Aronson, 1969; Dunning, 2007; Festinger, 1957; John Thøgersen, 2006).

Under certain conditions, as a pro-environmental orientation reaches its limits, other incentives are needed. Some studies have shown that people with a selfish orientation were more likely to engage in pro-environmental actions when personal benefits were made salient (De Dominicis, Schultz, & Bonaiuto, 2017). The same was shown for a non-activist subgroup (Jia et al., 2017). Thus, non-environmental incentives such as social status (Griskevicius, Tybur, & Van den Bergh, 2010) might be successful for inspiring pro-environmental behavior in certain target groups that score low in biospheric or self-transcendence values.

Nevertheless, making self-enhancement motives salient could undermine people's intrinsic motivation to act in an environmentally friendly way. For instance, engagement might disappear when certain rewards for behavior are no longer present (Bolderdijk & Steg, 2015). In addition, such rewards might simply have a selective effect for a specific action (Kollmuss & Agyeman, 2002). A spillover effect, by which a person's motivation is extended so that the person engages in other pro-environmental actions, can be undermined via rewards (Evans et al., 2013; Steinhorst, Klöckner, & Matthies, 2015; J. Thøgersen & Crompton, 2009), which (in the long run) tend to lower pro-environmental behavioral tendencies.

Because some pro-environmental behavior patterns simply cannot be promoted via self-interest incentives, norm activation is an important anchor point for an intervention. In accordance with the NAM, it is important to have an awareness of negative consequences and to feel responsible for behavioral consequences in order to strengthen one's moral norms. Thereby, both reasoning and emotions (Greene & Haidt, 2002) are drivers of moral judgment. Using these considerations to lay the groundwork, communication campaigns should focus on the activation of intrinsic motivation and should make pro-environmental values more salient. Letting moral norms arise – thus fostering people's awareness of consequences and their feelings of responsibility – seems to be a fruitful approach.

9.4 Essential results of an online-survey

To assess potential barriers to sufficiency in plastic use but also to detect factors that might encourage it, an online survey was implemented. 648 individuals participated in this survey during summer 2017. In essence, the willingness to reduce plastic packaging was strongly influenced by perceptions of behavioral control (e.g. shopping facilities, knowledge about alternatives). Furthermore, people who had a positive attitude toward plastic (e.g. regarding it as practical or hygienic) showed lower intentions to reduce their packaging consumption. However, moral norms (e.g. feeling a moral obligation or having the conviction to act in line with one's own values) and ethical emotions (e.g. anger or outrage) had a strong additional influence, highlighting consumers' intentions to do the right thing, guided by their feelings for other people.

Similar results were found for intentions to engage in political behavior: Ethical emotions and moral norms showed the strongest influence. In contrast to the prediction of private behavioral intentions, perceived behavioral control had no influence on political behavioral intentions, underlying the possibility that people who do not feel capable of reducing their own packaging consumption can still show a high willingness to change society's circumstances in a political way.

Furthermore, results revealed that people who regard plastic as a huge risk and expressed the belief that consumers are responsible for solving the plastic problem expressed higher moral norms. Social role models in participants' immediate environment and feelings of anger as well as guilt about the negative consequences of plastic had further predictive power.

9.5 Implications for environment protection interventions and policies

In accordance with the slogan "The best waste is the kind that never arises", environmental campaigns should not be afraid to focus on reduction rather than recycling behavior, which is often expected as the easier alternative. Thereby, rather than focusing on self-related aspects, interventions should focus on other aspects (e.g. the protection of sea life). Both private and political activities work together like cogs in a wheel and should therefore be reinforced through campaigns (e.g. via political protests in a supermarket).

Because the moral willingness to act is strengthened by problem awareness and responsibility attribution, the roles of consumers, what they can do to act and their potential for social influence, should be emphasized. For example, a story about a family that is trying to avoid plastic waste in their household by taking concrete steps to act would make an impact in this sense. Furthermore, because the consequences of people's actions are often temporally distant, they should be made more concrete and perceptible (e.g. pictures of a sea turtle with a plastic straw in its nose). Such tangible examples can trigger emotions that can drive people to take action. To avoid a feeling of helplessness, giving people opportunities to act (e.g. by handing out cards that map out the zero-waste shops) is an important supplement that can give people more of a belief that they have control. This combination of sensitizing people to plastic pollution and demonstrating the steps that can be taken to act have already been successful in interactive activities for reducing plastic packaging consumption and encouraging others to adopt the same actions (Hartley, Thompson, & Pahl, 2015; Hartley et al., in press).

In sum, research has shown that people are open-minded toward change with respect to both private and political behavior patterns as far as plastic pollution is concerned, and this gives hope that well-situated interventions or political decisions will be successful and accepted by the public to curb the plastic problem in the future.

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10 Feedback as a guide or an excuse? A motivational account of providing effective pro-environmental consumption feedback

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Abstract

The practice of consumption feedback has been increasing lately, notably with respect to sustainable consumption (e.g., energy consumption, sustainability of people's groceries shopping). However, research in psychology has shown that such feedback can have unexpected effects, sometimes motivating people to increase their efforts but also sometimes demotivating them and leading to a reduction of subsequent efforts. I propose here a motivational approach to understanding the effects of consumption feedback. I describe research showing that positive feedback can be construed either as a guide for future behaviour or as an excuse justifying a relaxation of further efforts. On this basis, I provide advice on how to develop effective feedbacks, both positive (i.e., informing someone that their current behaviour is actually quite sustainable) and negative (i.e., informing someone that their behaviour is not sustainable enough, or less sustainable than average).

10.1 Productive and counterproductive effects of consumption feedback

The practice of consumption feedback, and more specifically pro-environmental consumption feedback, has drastically increased these past years. Thanks to data computerisation, it has become very easy to quantify a consumer's behaviour, compare it with different standards (e.g., other consumers, the same person in the past), and pass on the information to the person. For example, the largest supermarket chain of Switzerland (Migros) now provides monthly feedback to customers who are part of their loyalty programme[2]. The feedback indicates the percentage of groceries purchased by the person that are labelled sustainable (organic, local, Fairtrade, etc.) in comparison to the percentage purchased by the same person the previous month as well as to the average of the state ("Kanton") and the country. What is the effect of such feedback? From a pragmatic point of view, it provides objective information on what the person has done, and what others did at the same time. From a social psychology point of view, it informs about how pro-environmental the social norm is (i.e., "what other people in my group are doing or think is appropriate to do") and triggers a process of social comparison through which the person will evaluate whether their behaviour is similar – or instead, different – from that of others. This process has important implications and can determine what the person will do in the future. Will they increase their efforts, or instead relax them and stop trying? Research suggests that both ways are possible.

[2] For an overview of this "Cumulus Green" programme, see https://www.migros.ch/de/cumulus/ueber-cumulus/cumulus-green.html

Negative feedback, or learning we are doing worse than others

The first case scenario is to learn that other people are doing better than we are. Returning to the example of Migros feedback, the person could learn that their percentage of sustainable purchases is lower than that of their state of residence's average. In this case, the usual reaction is to increase one's efforts and try to get closer to what others do. Indeed, humans do not like to feel different and there is a strong natural tendency to try and blend in with the group (Cialdini & Goldstein, 2004; Deutsch & Gerard, 1955). Hence, receiving a negative feedback should motivate the person to increase their pro-environmental efforts.

However, the negative feedback can sometimes have a discouraging effect. This can happen for example when the person has already been trying to change their behaviour for some time, but seem unable to reach the goal they have set. A feeling of inefficacy and discouragement that can translate in an outright cessation of all efforts may then arise (Abramson, Seligman, & Teasdale, 1978; Cochran & Tesser, 1996). Hence, the person realising that their sustainable shopping is way below average might simply give up and decide to save their money for something else – which is obviously not the effect the company wishes to obtain.

Positive feedback, or learning we are doing better than others

The second case scenario is to learn that we are doing better than other people; for example, our shopping habits are more sustainable than average. Just as with negative feedback, such positive feedback can have opposite effects. First, such feedback can have an encouraging effect, as the person realises they are doing well with respect to their goal. The person will then pursue their efforts, even try to increase even more their sustainable shopping. A large body of literature on the question of consistency supports this claim, showing that people try to maintain a coherent course of action (Festinger, 1957; Kiesler, 1971). Moreover, the repetition of behaviour translates in the creation of habits, which in turn strongly predict the adoption of the same behaviour in the future (Andrade & Ariely, 2009; Stern, 2000). This was for example illustrated in research showing that the higher the rate of household recycling, the greater the probability of continuing to recycle in the future (Carfora, Caso, Sparks, & Conner, 2017; Terry, Hogg, & White, 1999).

However, positive feedback can also backfire. Because it conveys the information that the person is doing *better* than other people, positive feedback can be interpreted as a cue that the person is doing *enough* and is not expected to try any harder from this point on. As such, the feedback can constitute an excuse explaining a relaxation of subsequent efforts. This effect, labelled "rebound effect", "boomerang effect" or "negative spillover", has been well documented. For example, Schultz, Nolan, Cialdini, Goldstein, and Griskevicius (2007) calculated the energy consumption of 290 households in California, then informed these households of whether they were consuming more or less energy than the average of the neighbourhood. One week and three weeks following this feedback, they calculated again energy consumption. The results showed that households who learned they were consuming more energy than average (i.e., negative feedback) decreased their consumption during the following weeks. However, households who learned they were consuming less energy than average (i.e., positive feedback) actually *increased* their consumption during the following weeks. The same effect was observed in other studies focusing for example on waste

recycling (Longoni, Gollwitzer, & Oettingen, 2014) or participation in collective pro-environmental action (Schumann & Klein, 2015). Again, this is obviously not the effect companies aim to obtain when they provide positive feedback.

How to predict the effect the feedback will have?

We just saw that both positive and negative feedback can have contradictory effects, sometimes motivating and sometimes demotivating people to adopt further pro-environmental behaviour. The question arises then to understand in which conditions, or for which people, we will most likely obtain one effect or the other. I propose here that psychology of motivation can provide insightful guidelines to predict and shape people's reactions to feedback. I rely mostly on one theory of motivation, that is, regulatory focus theory. The next section briefly describes the layout of the theory, then explains how regulatory focus interacts with both positive and negative feedback.

10.2 Regulatory focus and consumption feedback: a motivational account

10.2.1 Regulatory focus theory

Regulatory focus theory proposes that two independent motivations coexist within the individual (Higgins, 1997). On the one hand, a *prevention* focus is related to the individual's need for security and the accomplishment of their obligations and duties, as defined by other people and society but also the self. When people are oriented towards prevention, they focus more on the potential negative consequences of their actions and prefer vigilance strategies in order to try and avoid these negative consequences (Crowe & Higgins, 1997). Typically, a person that closely watches their household energy consumption and make sure they do not exceed a certain threshold demonstrates a prevention motivation.

On the other hand, a *promotion* focus is related to the individual's need for nurturance and growth and the accomplishment of their ideals and aspirations. When people are oriented towards promotion, they focus more on the potential positive consequences of their actions and they prefer eagerness strategies in order to try and approach these positive consequences. A person who seeks information about eco-friendly electrical appliances and make sure to acquire the more eco-friendly devices typically demonstrates a promotion motivation. As such, it is important to note that the final outcome can be the same (here, a reduction of household energy consumption) although it was obtained by different means and underpinned by different motivations.

Importantly, regulatory focus can be conceptualised in two ways. First, and consistent with the examples given above, regulatory focus can represent a stable interindividual difference, a form of motivational trait describing how a certain person tends to act in their life (some people being more promotion-oriented and some being more prevention-oriented). Several scales were developed in the literature that measure such an orientation (e.g., Higgins et al., 2001). Second, regulatory focus can be punctually, contextually induced. Presenting information in a way that insists more on possibilities for growth and potential positive consequences that could be reached (versus possibilities for safety and potential negative consequences that could be avoided) has the effect of punctually putting the person in a promotion (versus prevention) mindset. This has important implications for the field of communication and persuasion (see Figure 15 for two examples of communications adopting

different motivational approaches): should we (regardless of the objective situation) insist on the environmental catastrophe that will uphold if humans do not take action, or on the potential of improvement of the situation if they *do* take action? There is no clear answer to this question as no clear superiority of any of the two strategies emerges. Instead, it seems that the strategy should be adapted to the characteristics of the behaviour being advertised (Bertolotti & Catellani, 2014). Moreover, messages have been found to be more effective when they correspond to the motivational orientation of the receiver (Cesario, Higgins, & Scholer, 2008).

Figure 15: Left: “If you don’t pick it up they will.” Prevention-framed message advertising against littering. Right: “I may be trash but I am recoverable. Give trash a second life.” Promotion-framed message advertising for compost recycling.

10.2.2 Regulatory focus and reactions to consumption feedback

Above its relevance for persuasive messages and communication framing, regulatory focus also has implications with respect to consumption feedback. As stated in the theory, promotion-oriented individuals are more sensitive to positively-framed information, whereas prevention-oriented individuals are more sensitive to negatively-framed information. For example, promotion-oriented people get motivated when they think about how other people succeeded at something (and how they could similarly succeed themselves; i.e., a positive role model) while prevention-oriented people get motivated when they think about how other people failed at something (and how they could in contrast avoid failure; i.e., a negative role model; Lockwood, Jordan, & Kunda, 2002).

As such, it makes sense to expect that regulatory focus could shape reactions to positive and negative feedback. This was explored in one study where participants had to complete an anagram task. Midway through the task, participants received a performance feedback. Half of them were informed their performance was better than average, while the other half learned their performance was worse than average (all feedbacks were in fact bogus and randomly distributed). The researchers then let participants continue with the task and measured their performance in the second half of the task. Results showed an interactive impact of feedback (positive versus negative) and the participants’ regulatory focus (which was measured before the task): promotion-oriented participants performed better than prevention-oriented ones after receiving a positive feedback; contrariwise, prevention-oriented performed better than promotion-oriented ones after receiving a negative feedback (see Figure 16). In other words, the effect of the feedback reverses as a function of

regulatory focus: in a promotion focus, the positive feedback has an encouraging effect and leads to greater effort in the task, whereas in a prevention focus it translates in feelings of having done enough and leads to a reduction of further efforts. In contrast, in a prevention focus the *negative* feedback has a motivating effect and leads people to try harder, whereas in a promotion focus it is discouraging, perhaps giving an impression that the task is too difficult and that nothing can be done. Similar results were found in other studies providing feedbacks about performance at work (Van Dijk & Kluger, 2003, 2010).

As informative as these results are, they only concern *performance* feedback. Could the same logic apply to *consumption* feedback? This is the question I addressed, with my colleagues, in a series of experimental studies.

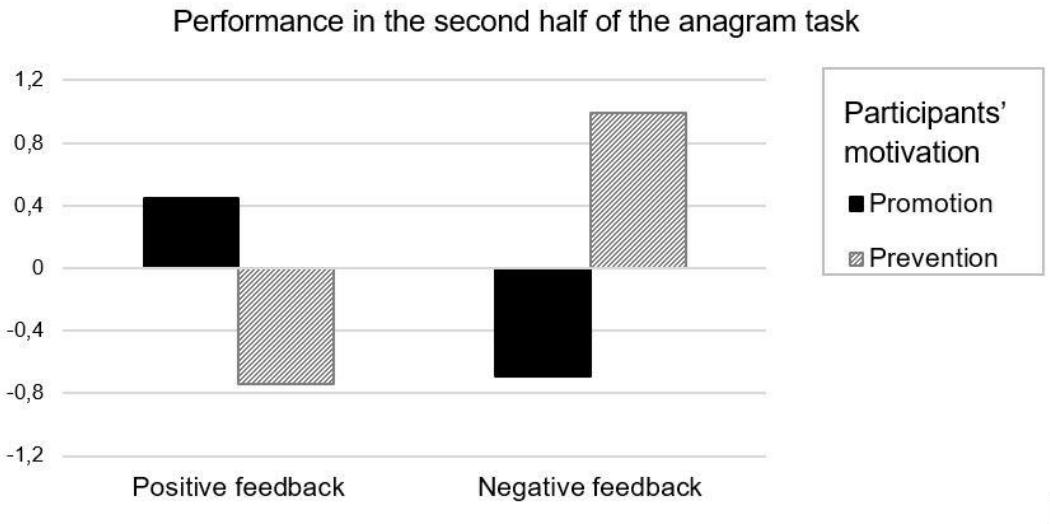

Figure 16: Results of Idson and Higgins's experiment (2002). Higher scores represent better performance in the second half of the anagram task (scores are standardised).

10.3 Results in a nutshell

10.3.1 Experimental findings

We conducted two studies in which we (a) put participants in a prevention or promotion mindset, (b) provided them with a (bogus) feedback regarding the degree of sustainability of their daily-life habits, and (c) measured their intention to engage in subsequent pro-environmental behaviour as a result of the motivation and the feedback (Lalot, Falomir-Pichastor, & Quiamzade, 2018). In the first study, participants were American laypeople recruited through a webpage. The key intention was the willingness to waive some of Christmas traditions (e.g., reduce outside lighting displays) in order to "reduce the eco-footprint of Christmas and help celebrate the season while caring for the earth."

Results showed that intention was a function of both feedback and regulatory focus. Specifically, participants who received a negative feedback regarding their daily-life habits reacted in a compensating way and expressed higher intentions to have a "Green" Christmas. This happened regardless of the regulatory focus manipulation. The effect of the positive feedback, however, clearly depended on regulatory focus: participants who were put in a promotion mindset got motivated by the positive feedback and expressed high pro-

environmental intentions. In contrast, participants who were put in a prevention focus took the positive feedback as a signal they were doing enough and subsequently expressed lower pro-environmental intentions.

These results were replicated in a second study that included an additional experimental condition in which participants received no feedback. In this study participants were 201 Swiss students. They completed a very similar study (regulatory focus manipulation followed by the bogus feedback procedure), then expressed their intention to make more pro-environmental efforts in their daily life in general. The differential effect of positive feedback was replicated (prevention < promotion). Moreover, here the effect of negative feedback also depended on regulatory focus, consistent with previous findings by Idson and Higgins (promotion < prevention).

10.3.2 Summary

In summary, we observed that feedback informing people of the degree of sustainability of their habits impacted their intentions to engage in pro-environmental action, and that the direction of this effect depended on the motivational mindset they were put in. Let us mention here that similar effects were observed in follow-up studies where we measured regulatory focus as an interindividual difference instead of measuring it.

Regarding positive feedback, the picture is quite clear: positive feedback is motivating as long as people are oriented towards a promotion focus. In contrast, when people are oriented towards a prevention focus, positive feedback has a rebound effect and leads to a reduction of further efforts.

Regarding negative feedback, results are less conclusive. Globally, people take the negative feedback as a signal that they are underperforming and that more effort is needed; as a result, they are willing to adopt more sustainable behaviour in an effort of compensation. This seems to be even more the case when people are oriented towards a prevention focus. Promotion-oriented people seem to sometimes get demotivated by the negative feedback. We are currently conducting other studies to better understand what exactly happens with these people. As it is, we believe the impression of being too far from the goal plays a key role: people could invest more efforts as long as they feel the goal is reachable; however, if they think it is too difficult and they cannot get where they should be, then they would stop trying.

10.4 Implications for environment protection interventions and policies

This research has implications for practitioners and policy makers who aim to implement effective consumption feedbacks. It suggests that feedbacks are useful and powerful tools but that they must be used with caution as their effect can backfire and yield results opposed to what was expected.

First, for small-scale interventions or even personal interventions in which the targets' motivational orientation could be known beforehand, we would recommend creating feedbacks that fit the person's orientation: promotion-oriented individuals should foremost receive positively framed information (e.g., insisting on the sustainable actions they have accomplished so far), whereas prevention-oriented individuals should foremost receive

negatively framed information (e.g., insisting on the sustainable actions they failed to perform, or on their non-sustainable past deeds).

Of course, it is not always possible to have such psychological information beforehand. Hence, as a second suggestion, we propose to make sure that feedbacks are framed in accordance with their valence. That is, positive feedbacks should put forth the positive outcomes that were successfully achieved and insist on the ideal goal of pro-environmentalism. Conversely, negative feedbacks should highlight the negative consequences that happened as a result of the person's lack of efforts and insist on the mandatory nature of pro-environmental action (e.g., necessity). This "fit" between the feedback valence and its framing should increase its efficacy (Pham & Higgins, 2004).

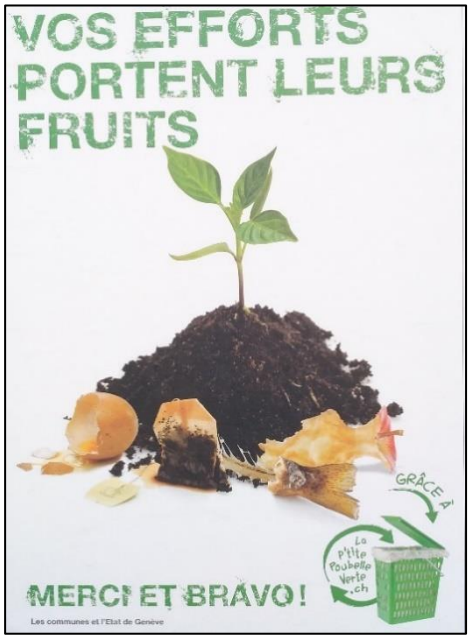

Figure 17: "Your efforts do bear fruits." Follow-up advertising for compost recycling, representative of a promotion framing.

Advertisement for compost recycling in Geneva provides a good example of such feedback framing. Following two years of advertising in favour of household compost recycling and distribution of free compost bins (see Figure 15), the campaign moved to a "thank you" phase, putting forward the positive outcomes of the Genevan population's efforts and urging to pursue these efforts. The growing plant on the poster (displayed in Figure 17) nicely hints to the need for growth and nurturance characterising a promotion focus. Based on the scientific evidence available, we would predict this campaign should successfully manage to keep citizens motivated.

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Images credits

Figure 15

Left: Print advertisement created by TBWA, South Africa for Endangered Wildlife Trust (2010). Retrieved on: https://goo.gl/images/tHg1qa

Right: Print advertisement created by La P'tite Poubelle Verte, State of Geneva (2017). Retrieved on: https://goo.gl/images/7uZ15t

Figure 17

Print advertisement created by La P'tite Poubelle Verte, State of Geneva (2018). Photography taken in the streets of Geneva in May 2018.

11 Studying Ambivalence in Environmental Psychology: Unsustainable Dietary Practices Are Maintained by Moral Disengagement

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Abstract

Many attitudes towards pro-environmental behaviors are ambivalent, that is, they simultaneously consist of positive and negative evaluations towards the same object. According to psychological consistency theories, the experience of such ambivalence is aversive—being the basis for behavioral change if the ambivalence is reconciled. In the present chapter, we will examine how ambivalence may influence pro-environmental behaviors in general, and we will try to validate these claims by reviewing an article about meat-related ambivalence in specific. That is, ambivalence is particularly present in attitudes towards meat: On the one hand, meat is perceived as something positive as it provides traditions and enjoyment to many people; on the other hand, meat is perceived as negative as its production is detrimental for the environment, for health, and causes the death of millions of animals. By studying meat-related ambivalence, it is therefore possible to examine how omnivores (i.e., meat-eaters) and non-omnivores deal with the so-called meat paradox — a prime example of the state of ambivalence. In fact, the reviewed article demonstrates that omnivores generally experience more meat-related ambivalence than non-omnivores, indicating that most non-omnivores reconciled their ambivalence while refraining from meat. More importantly, omnivores who experience high levels of ambivalence towards meat seem to cope with their conflict via moral disengagement, allowing them to maintain their dietary practices. This bears strong implications for attitudinal and behavioral change regarding pro-environmental and consumer behavior.

11.1 Ambivalence in Environmental Psychology: An Often Overlooked Phenomenon

Overlooked by many attitude-behavior models (e.g., the theory of planned behavior; Ajzen, 1991) environmental attitudes are often inherently ambivalent involving positive and negative evaluations at the same time. A prominent example for ambivalence in environmental psychology is recycling behavior: On the one hand, most people believe that recycling is positive because it is good for our environment; on the other hand, the same people evaluate recycling negatively because the behavior involves effort and does not provide a direct personal benefit. Thus, especially young adults do not belief that recycling fits to their lifestyle, although they belief that it is important for the society and the environment (Ojala, 2008).

In many cases, ambivalence towards pro-environmental behaviors can be traced back to a goal conflict between hedonic and gain goals versus normative goals. Whereas hedonic and gain goals describe motives to “improve your mood” or to “protect and accumulate your resources” respectively, normative goals refer to motives about what is “right to do” (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014). As these goals can be active simultaneously, goal conflicts may emerge, and ambivalence towards behaviors may arise. Conflicting goals, thereby, constitute the basis for ambivalent attitudes towards pro-environmental behaviors.

Problematically, ambivalence weakens the attitude-intention and attitude-behavior link: If people are ambivalent towards a behavior, they are less likely to act in accordance with a normative goal (Van Harreveld, Nohlen, & Schneider, 2015). This is because ambivalence elicits discomfort, and people are able to cope with this discomfort in a variety of ways that does not include the normative behavior. For example, they may delay their decisions, rationalize their behavior or avoid the behavior all together (Van Harreveld et al., 2015). It may be argued, however, that ambivalence may also be a starting point for behavioral change if it is resolved in a normative way (i.e., refraining from an unsustainable behavior). Thus, studying ambivalence and investigating how people cope with ambivalence is important to understand why people do or do not engage in pro-environmental behaviors.

11.2 Ambivalence and Sustainable Dietary Practices

A specific pro-environmental behavior that has often been discussed as being highly conflicted is meat consumption. In fact, researchers already created a term for the conflict that arises from meat consumption: the *meat paradox* (Loughan, Haslam, & Bastian, 2010). The meat paradox describes that people like to eat meat due to sensory pleasure, but they also do not want to be associated with the negative consequences of it (e.g., the suffering of animals, the detrimental consequences of the environment, or associated health issues). Interestingly, many people continue to eat meat despite the negative consequences of meat consumption and the resulting ambivalence towards meat. Thus, in recent decades a lot of researchers investigated how people cope with the meat paradox, helping them to maintain their dietary practices (for a review see Bastian & Loughnan, 2017).

Their research shows that people developed a variety of coping strategies to maintain their meat-eating practices (Bastian & Loughnan, 2017). These strategies may be considered as moral disengagement, and include, among other strategies, the denial of harm, and the diffusion of responsibility. To deny the harm of their dietary practices, people may attribute less emotion and mind to animals (e.g., Bilewicz, Imhoff, & Drogosz, 2011), and to diffuse their responsibility they may use rationalizations and render meat consumption, for example, as necessary, natural, normal, and nice (e.g., Piazza et al., 2015).

Although there is plenty of evidence that triggering the meat paradox results in a variety of moral disengagement strategies (e.g., Loughnan et al., 2010; Rothgerber, 2014), ambivalence, as a crucial process variable underlying the meat paradox, has rarely been measured. In the rare occasions that meat-related ambivalence has been subject to research, these studies have been inconclusive, however, because they did not include measures of moral disengagement (e.g., Berndsen & van der Pligt, 2004).

11.3 Measuring the Meat Paradox: An Empirical Investigation

To close this research gap, a study was conducted in our research group, aiming to validate the assumptions regarding the meat paradox and its coping strategies while providing an unobtrusive measure of meat-related ambivalence (Buttlar & Walther, 2018). Thus, based on the work of Schneider and colleagues (2015), a behavioral measure of ambivalence was adopted. To be more precise, this measure may help to examine meat-related ambivalence by measuring the response conflict elicited by meat and plant-based dishes in an evaluation task called the Mouse-Tracker paradigm (Freeman & Ambady, 2010).

During the Mouse-Tracker paradigm, omnivorous and non-omnivorous participants were, thus, asked to indicate if different objects are either negative or positive for them by clicking with a computer mouse on one of two response buttons. These response buttons were located in the upper right and upper left corner of the computer screen. As the computer mouse started at a fixed position in every trial (i.e., the lower middle of the screen), ambivalence could be quantified by measuring the geometrical pull of the mouse trajectory towards the non-chosen option. That is, during the evaluation of ambivalent objects the path of the mouse takes a bigger curve—being drawn stronger towards the non-chosen option—compared to non-ambivalent objects (Schneider et al., 2015). It was hypothesized that omnivores experience more ambivalence (i.e., greater curve towards the non-chosen option) in trials depicting meat dishes than non-omnivores. In trials with plant-based dishes no differences were expected between groups. Figure 18 depicts two exemplary trials for plant-based and meat dishes in the Mouse-Tracker paradigm.

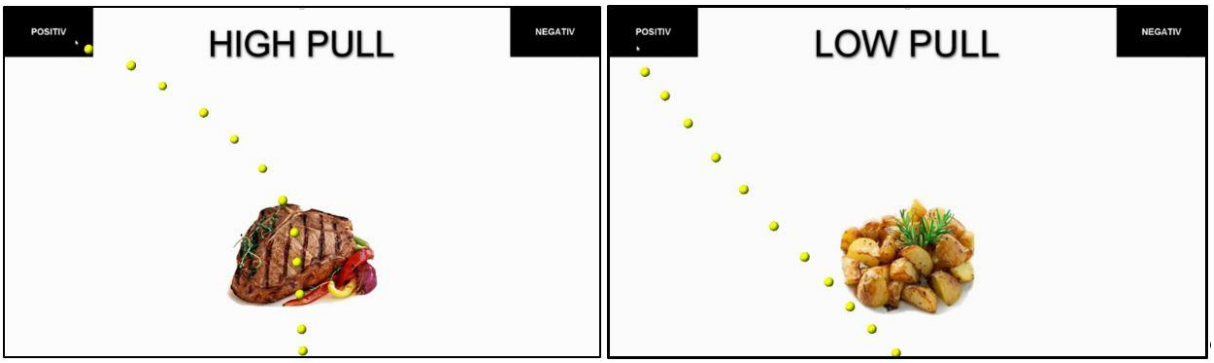

Figure 18: Depiction of two trials in the Mouse-Tracker paradigm depicting meat and plant-based food pictures taken from the food pics data base (Blechert, Meule, Busch, & Ohla, 2015). The yellow dots were not visible for the participants; they were inserted to illustrate the expected mouse trajectories for omnivores.

After participants completed the mouse-tracker paradigm, they were asked to estimate the emotions and mental capacities that they would attribute to animals (Rothgerber, 2014), and they were asked to indicate their agreement with statements regarding rationalizations that render meat consumption as necessary, natural, normal, and nice (Piazza et al., 2015). It was hypothesized that only people who feel ambivalence about meat, would need to cope with this conflict and endorse these moral disengagement strategies.

Regarding the first hypothesis, the results showed that omnivores, indeed, feel more ambivalence towards meat dishes than non-omnivores; for plant-based dishes there were no differences between the groups (for a depiction of the averaged mouse trajectories see Figure 19). Regarding the second hypothesis, the results indicated that omnivores attributed less emotions and mental capacities to animals if they experienced greater ambivalence; for rationalizations of meat consumption, no moderation was found (for detailed statistics see Buttlar & Walther, 2018).

The reviewed article (Buttlar & Walther, 2018), thus, supports crucial assumptions about the meat paradox. That is, omnivores are more strongly conflicted about meat-products than non-omnivores, and they morally disengage from their harmful practices if they experience ambivalence. It has to be noted, however, that there were differences regarding the use of

coping strategies: while omnivores seemed to disengage morally by denying the harm of their practices by attributing less mind and emotions to animals if they were conflicted, the results indicated that they did not use more explicit strategies like rationalizations of meat consumption to resolve their conflict.

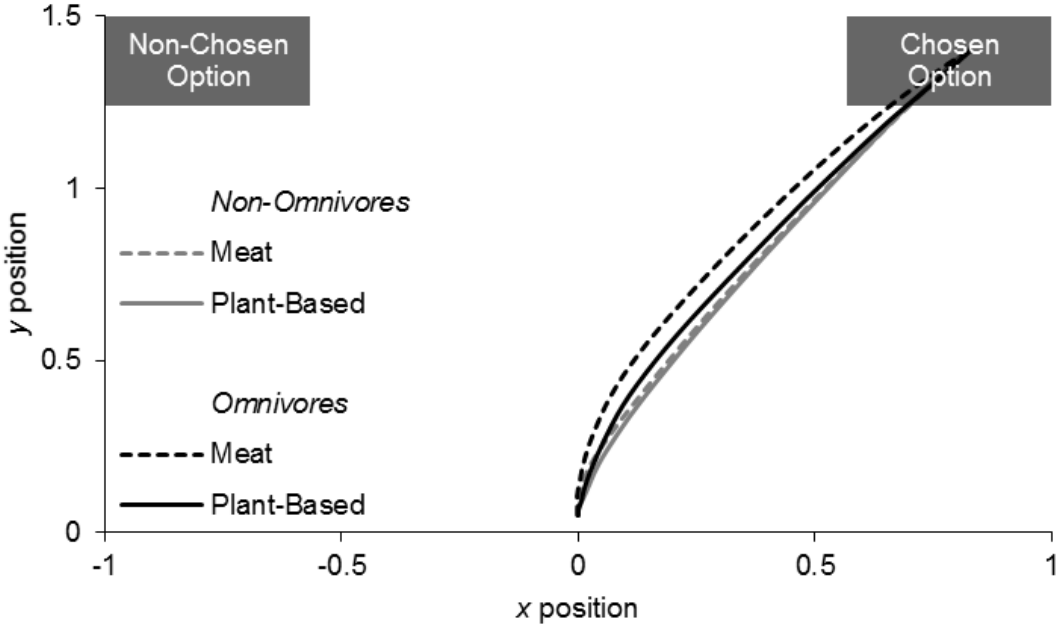

Figure 19: Visualization of averaged mouse trajectories depicted separately for plant-based vs. meat dishes and for omnivores vs. non-omnivores. To allow comparisons, responses to the left were flipped horizontally.

11.4 Practical Implications for Environment Protection Interventions and Policies

Of course, these findings first and foremost have strong implications for environment protection interventions and policies regarding meat consumption due to the big environmental impact of meat (Tilman & Clark, 2014). In fact, it has to be noted that one main cause for anthropogenic climate change stems from the food choices that individuals make every day, resulting in an enormous demand for meat (Smil, 2013). Problematically, meat production is very resource-intensive. Livestock and the crops for their feed take up one third of the earth's ice-free land which accounts for 70 per cent of all land used for agriculture. However, animal agriculture accounts only for 17 per cent of humanities calorie intake worldwide (Steinfeld et al., 2006). Unnoticed by many, animal agriculture thus contributes more to climate change than every other factor—including the global transportation system (Steinfeld et al., 2006). Downsizing animal agriculture, thus, might be one of the most effective ways to reduce climate change.

Based on the reviewed findings (Buttlar & Walther, 2018), it can be argued that some strategies seem to be more important regarding people's ability to cope with the meat paradox than others. Policies and interventions regarding meat consumption could, therefore, focus more closely on implicit moral disengagement strategies, like the denial of harm. In fact, it seems like conflicted omnivores cope with their ambivalence especially by denying animals mind and emotions, but not by rationalizing meat consumption. Thus,

focusing on this rather implicit strategy—compared to rationalizing meat consumption rather explicitly—may proof to be effective in interventions and help to reduce meat consumption. That is, information may be spread in intervention campaigns about animals' mental and emotional capacities, which make them highly sensible beings (Joy, 2010). This way, it may become more difficult for people to accept the harm on animals being inflicted by animal agriculture (Joy, 2010), making it more difficult for them to resolve the meat paradox.

Going beyond meat consumption, measuring behavioral ambivalence may also stimulate research in other areas of environmental psychology by systematically investigating (goal) conflicts in pro-environmental behavior. In fact, pro-environmental behaviors are not only inherently ambivalent as outlined in the introduction, but people frequently use moral disengagement strategies to maintain unsustainable behaviors (Bandura, 2007). Parallel to the moral disengagement strategies that are known in research on the meat paradox (Bastian & Loughnan, 2017), the typical strategies to resolve inconsistency in unsustainable behavior involve minimizing or misconstruing the impact of the detrimental practices, and the displacement or diffusion of responsibility (Atkinson & Kim, 2015). Thus, future research should consider investigating ambivalence and goal conflicts more systematically in pro-environmental behavior by using considerate ambivalence measures and by studying moral disengagement. Insights from these studies may be put into practice in interventions and policies to avoid that people uphold their unsustainable practices although they know about their actions detrimental consequences.

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12 Investigating Visitor Attitudes, Beliefs & Behaviour Change in the Brecon Beacons National Park

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Abstract

When on holiday, individuals often perform less pro-environmental behaviours than they do at home. This change in behaviour across contexts can have a detrimental impact on protected areas and on sites of ecological and geological importance. One such site is the Brecon Beacons National Park, in South Wales, UK. The National Park sees around five million visitors per year and this has led to a rise in environmentally damaging behaviours. As such, the Brecon Beacons National Park Authority, who manage the National Park, want to encourage visitors to perform more pro-environmental behaviours. This review outlines a case for research investigating visitor behaviours, attitudes and beliefs, discussing the current literature around the antecedents of pro-environmental behaviours and how they mediate behaviour. A brief outline of methods for the on-going research is followed by a summary of implications for practitioners on interventions and policy. We provide suggestions on how research can help inform policy and interventions with a special focus on the innovative use of GPS logging.

12.1 Introduction

Recent government and national changes have seen a push towards changing the behaviour of citizens to be more sustainable (Nash et al., 2017; UN Development Programme, 2016; United Nations Climate Change, 2018). However, for behaviour change to happen on a large scale, interventions that have far-reaching impact beyond their target behaviour and contexts need to be developed (Thøgersen & Crompton, 2009). This is essential, as research has shown a clear disparity between environmental behaviours across contexts (Nash et al., 2017). For example, research has found that when on holiday, individuals often perform less pro-environmental behaviours than when at home (Barr, Shaw, Coles, & Prillwitz, 2010). The impact of this negative behavioural spillover is observable in holiday hotspots around the world but also within the UK.

Covering 1,344 km^2, the Brecon Beacons National Park (BBNP) is one of three national parks in Wales and is one place where the impact of unsustainable behaviour is high. National Park status in the UK, essentially means that the area of the BBNP contains sites of special scientific interest as well as the western-half of the Park holding UNESCO GeoPark status. The National Park attracts around 5 million visitors a year, with numbers increasing year on year, the Brecon Beacons National Park Authority have noticed that visitors are having an increasingly detrimental impact on the environment.

This review will discuss the need to define environmental behaviours, before looking at the antecedents of environmental behaviours. Finally, the review will give a brief outline of the methods of on-going research into visitor behaviour in the Brecon Beacons National Park

and at home before discussing the implications to managers of protected areas for behaviour change interventions and their own research.

12.2 Understanding Environmental Behaviours

In order to understand both pro-environmental behaviours and environmentally damaging behaviours, there is a necessity to first define environmentally significant behaviours. Both pro-environmental behaviours and environmentally damaging behaviours come under the broader umbrella of environmentally significant behaviours and these are defined by “impact: the extent to which it changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself” (Stern, 2000). Environmentally significant behaviours can be further categorised into direct impact behaviours (e.g. deforestation and recycling household waste) and indirect impact behaviours (e.g. policy changes) (Stern, 2000).

12.2.1 Pro-Environmental Behaviours

Earlier work from Sivek and Hungerford, (1990) defined responsible environmental behaviour as “any action, individual or group, directed toward the remediation of environmental issues/problems”. Whilst this definition does capture the essence of pro-environmental behaviours, more recent research has updated this earlier definition as “an action by an individual or group that promotes or results in the sustainable use of natural resources” (Halpenny, 2010). Sustainable being defined in terms of the following definition of sustainable development; “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987). Halfpenny’s definition introduces indirect behaviours too, suggesting that lobbying government or promotion of a behaviour is equally weighted with a direct action or behaviour. For this review, pro-environmental behaviours will be defined as “any action by an individual or group that promotes or results in the sustainable use of natural resources” (Halpenny, 2010).

12.2.2 Environmentally Damaging Behaviours

Whilst much research focuses on pro-environmental behaviours, it’s also important to investigate and understand environmentally damaging behaviours. It may seem pointless to define environmentally damaging behaviours, as they usually are the opposite of pro-environmental behaviours, however some are not. If we describe recycling as a behaviour; the pro-environmental behaviour would be that a person recycles their waste and, conversely, the environmentally damaging behaviour would be that they do not recycle. In this instance, the environmentally damaging behaviours are the antithesis of the pro-environmental behaviour. However, if we use off-road motorcycling as an example, the damaging behaviour would be riding motorcycles on public paths and the pro-environmental behaviour would be *not* riding bikes on paths. Yet, someone who has never ridden a motorcycle could not be defined as performing a pro-environmental behaviour simply because they don’t ride a bike on the paths. Clearly, only bike riders as a group can perform the pro-environmental behaviour.

The Brecon Beacons National Park Authority deals with a variety of environmentally damaging behaviours that fall into this remit; sheep worrying (from dogs), off-road biking and wild-camping for example. As such, environmentally damaging behaviours are defined as "any action, by an individual or group that promotes or are results in the unsustainable use of or damage to natural resources". When researching environmentally significant behaviours, there are two main ways to measure behaviour(s). The definitions above are impact-orientated, whilst much research investigating pro-environmental behaviours often focus on behavioural intent. An intent-orientated definition of environmentally significant behaviour is "a behaviour that is undertaken with the intention to change (normally to benefit) the environment (Stern, 2000). This intent definition differs from the more impact-orientated definitions used above, firstly, intent is identified as an independent cause of behaviour and secondly it notes that intent may not necessarily result in actual impact.

Both definitions are important for research, however the antecedents of behavioural intent differ to those of impact, and the role intent has on behaviour is questionable, too. There are two main theories used to explain behaviour in environmental behaviour research. The first, the *theory of planned behaviour* (Azjen, 2002), has its roots in the idea that attitudes and beliefs shape an individual's intention to perform a behaviour. The *value belief norm theory* (Stern, Dietz, Abel, Guagnano, & Kalof, 1999) is another explanatory theory. This theory is based on the idea that the interplay of various causal factors leads to behaviour.

12.3 Antecedents of Pro-Environmental Behaviours

This next section will briefly discuss some of the most well documented predictors and antecedents of pro-environmental behaviour.

12.3.1 Identity

Identity has been explored as an antecedent for pro-environmental behaviours. The concept of self-identity – the label people use to describe themselves – has been found to be a strong predictor of behavioural intention for environmental behaviours (Cook, Kerr, & Moore, 2002). The researchers found that a positive change in self-identity had a positive influence on intention, second only to change of the same magnitude in attitude. This has been supported by other research investigating the role and relationship between self-identity and other pro-environmental actions (Nigbur, Lyons, & Uzzell, 2010; Whitmarsh & O'Neill, 2010).

Environmental self-identity (i.e. whether you see yourself as someone who is the type of person whose actions are environmentally-friendly) has also been found to have a relationship with obligation-based intrinsic motivation and pro-environmental behaviour (Van der Werff, Steg, & Keizer, 2013). This research notes that the reason self-identity may influence pro-environmental behaviour is because of obligation-based intrinsic motivation; being motivated out of a sense of obligation related to approval from oneself or others. The authors suggest, future research should test if "campaigns that focus on environmental self-identity that strengthen the obligation-based intrinsic motivation are effective in promoting a range of environmentally-friendly behaviour, in the short as well as in the long term." (Van der Werff, Steg, & Keizer, 2013).

12.3.2 Place Attachment

Place attachment is another factor that has been found to have an influence on environmental behaviours. Its definition has been adapted over the years, with (Halpenny, 2010) defining it as “a bond with a particular place and characterised as having functional (place dependence), cognitive (place identity) and affective (place affect) aspects.” This is in contrast to the earlier works of Vaske & Kobrin (2001) who deemed functional place dependence as a separate aspect. The fact that the functional aspect is included in this more recent definition is important when considering the Brecon Beacons National Park, which prides it itself as being a “‘living landscape’ where people live and work.”

Research into place attachment has been found to mediate pro-environmental behaviours (Vaske & Kobrin, 2001), with a higher place attachment for a natural setting (in this case a local nature reserve) leading to greater pro-environmental behaviours in everyday life. This is further supported by Walker and Ryan (2008) who found that residents of Maine that had greater levels of place attachment were more supportive of conservation plans for the place.

In regards to National Parks and place attachment, research on place attachment and its effect on place-related pro-environmental intentions was conducted in a National Park in Canada. Halpenny (2010) found that place attachment mediated place-dependent pro-environmental behaviours, as well as the potential for spillover effects to behaviours outside of the National Park context. Further research from Jorgensen and Stedman (2001) found that residents in a lake district were more willing to engage in behaviours that maintained or enhanced value in the area if they had a higher sense of attachment to the place.

Finally, Ramkissoon, Weiler, and Smith (2013) argue that research in the area of place attachment in National Park contexts is “fragmented, scattered and often does not fully consider its multi-dimensional nature.” The authors state “moreover, with the exception of a few, studies investigating the spillover effect of visitors’ pro-environmental behaviours in a national park setting on their general pro-environmental behavioural intentions and behaviour remain scant in the literature, calling for more research in the area.” The framework suggested by the authors proposes a more complex view of place attachment, with place attachment having several moderators; place satisfaction, place identity and place affect. Clearly, there is a need for research in the area and the proposed research will hopefully be able to shed more light on the factors contributing to place attachment and its subsequent relationship with both place-specific pro-environmental behaviours, more general pro-environmental behaviours and spillover.

12.3.3 Connectedness to Nature

Not only can connections to a place lead to an increase in pro-environmental behaviour, so can a connection to nature. Connection to nature, also known as “relatedness to nature”, is defined as a “connection to nature, encompassing emotions, experiences and an understanding of human interconnectedness with all other living things” (Nisbet & Zelenski, 2013). Research has often used connectedness to nature in relation to health, with a greater connection generally being positively correlated with good health (Wyles et al., 2017). Connectedness to nature has also been found to have a positive relationship with pro-environmental behaviours (Gosling & Williams, 2010).

12.3.4 National Identity

National identity, (also referred to as nationalism within research), is understudied in relation to its role in environmental behaviours. Whilst place attachment, as described above, is one's spiritual connection or relationship with a specific location, national identity is more abstract and probably closer to a socio-political attitude. In fact, nationalism is defined as "the pursuit – through argument or other activity – of a set of rights for the self-defined members of the nation, including, at a minimum, territorial autonomy or sovereignty" (Barrington & Barrington, 2018). In one sense then, nationalism could be deemed as being more deeply rooted than place attachment, due to its links with socio-political stances and attitudes. Despite its potential role, there has been little research conducted on nationalism in the context of pro-environmental behaviours and beliefs.

Research investigating national identity and perceptions of beach pollution found that a strong national identity leads to residents perceiving beaches as less polluted (Bonaiuto, Breakwell, & Cano, 1996). The researchers highlight that at the time, nationalistic attitudes had markedly increased, and the current political climate may suggest that nationalistic attitudes are even greater now than they were 20 years ago. The researchers also suggest that the "denial" of beach pollution is a defence, not dissimilar to strategies used to cope with common identity threats.

Given the Brecon Beacons National Park's status as a "Welsh" monument, the differences in behaviour between those that identify as Welsh, British, English, Scottish and Irish could be an interesting insight into Nationalism and its influence on environmental behaviour in the National Park. Also, given the current political climate, with feelings of nationalism seemingly on the rise, there's great potential to look at nationalism and its impact on pro-environmental behaviours and attitudes.

12.3.5 Norms

Personal norms, as defined by Schwartz (1977) are self-expectations that are based on internalised values. Personal norms reflect commitment with internalised values and are experienced as feelings of personal obligation to engage in a certain behaviour (Schwartz, 1977). Personal norms have been found to play a role in pro-environmental behaviour (Harland, Staats, & Wilke, 1999). Whilst personal norms are focused on the individual, social norms cover subjective assumptions about how individuals should behave and how they actually behave and have been found to be reliable predictors of pro-environmental behaviours (Abrahamse & Steg, 2013). Social norms have been commonly used in behavioural interventions, such as student drinking (Perkins, Linkenbach, Lewis, & Neighbors, 2010). Social norms also impact pro-environmental behaviours, with researchers finding that the most effective messaging used to persuade visitors to the petrified forest national park in Arizona not to steal pieces of petrified wood were social norms messages (Cialdini, Demaine, Sagarin, & Barrett, 2006).

There is a clear relationship between social and personal norms, with social norms becoming personal norms through internalisation (Schwartz, 1977). The impact of social norms on personal pro-environmental behaviours has been investigated, with country-level norms influencing the norms of family and friends and in turn their pro-environmental behaviours (Culiberg & Elgaaied-Gambier, 2016).

12.3.6 Perceived Behavioural Control

Perceived behavioural control is essentially the degree to which a person feels they have the ability to perform a behaviour and is one aspect of the theory of planned behaviour. It has been found to mediate pro-environmental behaviour (Bamberg & Möser, 2007). Findings from Littleford, Ryley and Firth (2014) showed that positive spillover was more likely to occur when individuals have more control over their behaviours.

12.4 Research Questions

1. What are the main antecedents for pro-environmental behaviours in the National Park and at home?
2. How do behaviours and attitudes change across contexts, between home and the National Park, if at all?
    a. What sites are most detrimentally impacted by environmentally damaging behaviours, and what behaviours are these?

12.5 On-going Research

Research is currently being conducted to identify the main antecedents of behaviours of visitors to the Brecon Beacons National Park and to investigate the impact of visitors on the National Park. Below is a brief outline of the methods, although please note because research is on-going this is not an in-depth methodology.

12.5.1 Methods

2-Part Questionnaire. A 2-Part questionnaire will be used to gather information about visitors' environmental attitudes, beliefs and behaviours. Part 1 of the survey asks about feeling, attitudes and behaviours at home, as well as general environmental attitudes. Part 2 of the survey asks the same participants about their environmental beliefs, attitudes and behaviours in the National Park. It also asks about future home behaviours.

GPS Logging of Litter. Map Maker (Androidseb, 2018), is used to log every piece of litter one meter either side of a pre-determined route on selected sites. Data from the Map Maker app is exported as a KML file to Google Fusion Tables (Google, 2018) and heatmaps are created (see Figure 20 for an example). The heatmaps offer a visualisation of the worst areas on a site, and the GPS data in this study will be used to inform future intervention studies, with the worst areas potentially being points for intervention placements.

12.6 Implications for Environmental Protection: Interventions & Policies

Whilst research continues to measure the impact of humans on the environment, there is clear need for individual groups and organisations responsible for protected areas to rely less on anecdotal evidence to measure impact and to understand visitors' attitudes and beliefs to help inform interventions. Whilst the aforementioned study is a work-in-progress, conducting the research has offered valuable insights into how to run research in a protected area.

Previously, the National Park Authority have relied on anecdotal reports to measure litter on site. However, the use of low-cost technology such as the Map Maker (Androidseb, 2018)

app, which is free and can be downloaded onto any android device, alongside the free to use Google Fusion Tables (Google, 2018) has led to deeper and quantitative insights. The GPS logging of litter can be conducted alongside existing litter-picks or other management tasks, meaning that greater impact assessments can be generated with relatively low effort. A small-scale study by Natural Resources Wales for example, utilised GPS logging to find areas on a beach where dog fouling was most common. The researchers then placed signage at these points that indicated how long the walkers had to go (in minutes) until the next bin, and reduced dog fouling by 38%.

Figure 20 : Heatmap created using Google Fusion Tables showing litter from the National Park Visitor Centre (Libanus, Wales, UK) to Twyn Y Gaer and back. Map data © 2018 Google Imagery

GPS logging has also been used by UK groups to monitor and tackle flytipping. Flytipping is a common issue across the UK, with individuals illegally dumping waste (including household and commercial items) in areas of natural beauty across the UK. FlyMapper is an app downloadable to members of the public that enables them to report flytipping directly to local councils and authorities. The App notifies the relevant clean-up crews and also provides data and maps to monitor where flytipping is occurring most (Zero Waste Scotland, 2014). This kind of tool could be adapted to allow reporting of other behaviours, which could help inform management of protected areas.

Whilst the data from the current study has yet to be analysed, existing literature can help inform practitioners responsible for natural landscapes that are visited by tourists. For example, social-norms messaging is an effective way to encourage behaviours, particularly in areas that need to be conserved. Research has found that using messaging and images that imply that the majority of individuals perform a target behaviour, or *descriptive norms*, (e.g. not littering) increases the likelihood visitors will perform that behaviour. The researchers found that using signage at the beginning of a trail in the Petrified Forest National Park, USA, that had a photo of individuals admiring and taking photos of the petrified wood led to less theft of petrified wood than signage with a man taking wood with a red circle and bar symbol over his hand (i.e. do not do this behaviour). Importantly, the

researchers note how popularising the behaviour (in this case, using three actors in the photo with the descriptive norm) is important with descriptive norms.

For practitioners and land managers, using on site interpretation to convey messaging is often the most common way to share information to visitors. However, online interactions are also an important way for visitors and tourists to receive information. Use of social media to promote pro-environmental behaviours is a logical step, as previous research has found that social media can be utilised as a behaviour change tool (Perkins et al., 2010). In fact Perkins et al. (2010) highlight that social norms marketing via social media posts was successful at reducing drink driving across a state in the USA.

Social media isn't just a potential tool to communicate with visitors, but also to monitor and manage protected areas. Posts on social media with Geotags can not only lead to increasing visitor numbers to that site but also be used to inform visitor management plans (Donahue et al., 2018; Hamstead et al., 2018; Walden-Schreiner, Leung, & Tateosian, 2018). When marketing protected sites to visitors, attention should be paid to the sites being shared, if sharing photos and posts about sites that cannot cope with large visitor numbers may lead to more visitors and greater issues for the site.

12.7 Conclusion

The literature review and on-going research have highlighted a need for more research to be carried out by organisations and practitioners to discover the impact of visitors and tourists on protected areas and natural sites. Using low-cost techniques such as GPS logging can be an effective way to quantitatively measure visitor impact and offer insight into the best places to present interventions to visitors. Whilst tapping into the antecedents of pro-environmental behaviour can help with informing behaviour change interventions and policy management. It is hoped that the findings from the on-going research will help shed new light on the main antecedents of visitors to the Brecon Beacons National Park and that the link between behaviours at home and in a nature-based context will be clearer.

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13 Motives Driving Meat Consumption and Peoples' Willingness to Change

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Abstract

It is increasingly recognised that shifting demand away from meat and dairy is central to achieving climate change goals. However, few studies have investigated public attitudes towards eating less meat as a climate change strategy. We aimed to address this gap by exploring the motives driving meat consumption, awareness of the link between meat consumption and climate change, and peoples' willingness to eat less meat. This paper discusses the findings from 7 semi-structured interviews conducted with meat-eaters. The findings suggest that meat consumption was an unquestioned dietary habit reinforced by social norms, as well as by taste preferences and health concerns. Most participants appeared to be unaware of the link between meat consumption and climate change. Participants were willing to reduce their meat intake, but mostly for health-related reasons. Implications for potential interventions to reduce meat consumption are discussed.

13.1 Background

The production of livestock for meat and dairy consumption has multiple and profound impacts on the environment. It is associated with de-forestation, land degradation, water pollution and biodiversity loss (Gerber et al., 2013; Steinfeld et al., 2006). Crucially, livestock production for meat and dairy is a major driver of climate change. Methane, nitrous oxide and carbon dioxide are released at each stage of the production process, from the conversion of land for animal feed, through the heating and cooling of farm buildings, to the digestive processes and manure of the animals, as well as the processing and transportation of animal products to consumers (Wellesley, Happer, Froggatt & Philo, 2015). Livestock production for meat and dairy is estimated to account for around 15% of global greenhouse gas emissions, which is more than those emitted from the world's transportation sector (Bailey, Froggatt, & Wellesley, 2014). Emissions from the livestock sector are expected to rise with increasing demands for meat and dairy from rapidly developing countries. It is estimated that by the year 2050 meat and dairy consumption will have risen 76% and 65% respectively, against a 2005-2007 baseline (ibid). These predicted consumption trends are incompatible with the reduction of emissions needed to limit global temperature rises below two degrees Celsius (Wellesley et al., 2015).

Proposed mitigation strategies have mostly focused on reducing greenhouse gas emissions in the supply of meat and dairy, through increased productivity or through technical mitigation measures. However, it is increasingly recognised that this will not be sufficient to even offset rising greenhouse gas emissions. It is estimated that even if all livestock production practices adopted the least emission-intensive processes available, livestock emissions would still continue on an upward trajectory (Bailey et al., 2014). This has led to the suggestion that

mitigation strategies should instead focus on shifting demand, including reducing meat and dairy consumption, to keep global temperature rises below two degrees Celsius (Bajželj et al., 2014; Hedenus, Wirsenius, & Johansson, 2014).

Despite the need to address global meat and dairy consumption to meet climate change objectives, plans to elicit dietary change have been absent from most mitigation strategies (Laestadius, Neff, Barry, Frattaroli, 2014). It is thought that strategies to reduce meat and dairy consumption could face resistance from powerful interest groups, as well as backlash from the general public (Bailey et al., 2014). Thus, governments have instead focussed on pursuing mitigation in other sectors thought to be less controversial, such as energy and transport (Wellesley et al., 2015). However, the lack of attention afforded to this issue has contributed to a lack of public awareness regarding the impact of meat and dairy on the environment (Bailey et al., 2014). Furthermore, this has led to a shortage of research on public attitudes towards eating less meat as a climate change strategy.

The current study aims to address this gap to provide greater insight into the motives driving meat consumption and peoples' willingness to eat less meat, with an overarching goal of uncovering potential ways of encouraging diets that are more environmentally sustainable. More specifically, this study aims to: 1) identify the factors driving meat consumption; 2) examine public awareness of the link between meat consumption and climate change; and 3) investigate peoples' willingness to eat less meat.

13.2 The Current Study

Semi-structured telephone interviews were conducted with members of the UK public. The study was advertised in different places to access participants from a variety of backgrounds, who had different diets and dietary concerns. In this paper we discuss only the findings from the interviews conducted with participants who ate meat, to explore their motives for eating meat and their willingness to reduce their meat consumption. These participants were recruited via advertisement on the Cardiff University community panel (n = 5), snowball sampling within an environmental campaign group (n = 1), and through poster advertisements in a gym (n = 1). Participants were all female UK residents, with an age range of 20-42 years.

Interviews were conducted over the phone between the 15th March and 12th April 2017. Participants were asked a number of open-ended questions relating to their food choice and their awareness of the environmental impacts of meat consumption. Participants were also asked whether they would be willing to reduce their meat intake for a number of different reasons relating to their health, the environment, the welfare of animals and the welfare of workers. The duration of each interview ranged from 22-40 minutes and participants were paid £10 for taking part. Interviews were transcribed, recorded and analyzed using thematic analysis, in line with the processes outlined by Braun and Clarke (2006). The main findings are presented below. Participant names have been replaced with pseudonyms for anonymity.

13.3 Main Findings

13.3.1 Motives driving meat consumption

Meat consumption appeared to be an unquestioned dietary habit to many participants. Participants did not recall ever making a conscious decision to include meat in their diet, but viewed this as a natural progression from their upbringing.

“I guess it was just the way I was brought up and so I've continued with that really and I enjoy it” (Karen, 42)

This appeared to be reinforced by social norms surrounding the appropriateness of eating meat. For example, one participant recalled that she did not enjoy eating meat as a child, but was forced to eat it by her family who felt that her dislike of meat was ‘*weird*’. Meat consumption also appeared to be embedded within wider cultural norms, playing a key role in religious traditions and holidays. For example, another participant recalled eating more meat than usual during the Christmas period, commenting that a Christmas without meat would be ‘*pointless*’. Taste preferences and health concerns also motivated participants to eat meat, as meat was perceived to be tasty and adding to the variety to meals, whilst providing essential nutrients, including protein.

13.3.2 Awareness of environmental impact

Most participants appeared to be unaware of the link between meat consumption and climate change. Although many participants had heard that eating meat and dairy was bad for the environment, some were unsure how it impacted the environment and few participants explicitly linked meat consumption with climate change. Participants were also sceptical about the extent to which eating less meat would positively impact the environment.

“I know that eating meat and fish does [impact the environment], but I don’t really understand like in what sort of way.” (Becky, 24).

13.3.3 Willingness to change

Participants were generally willing to reduce their meat consumption for reasons relating to health, the environment, animal welfare and the welfare of workers. Overall, health appeared to be the most influential factor that would encourage participants to reduce their meat consumption. All participants said that they would be willing to eat less meat if it would improve their health, and some claimed that they would eliminate meat from their diet completely for health related reasons. Most participants were willing to reduce their meat intake for environmental reasons, however many stated that they would need to be shown convincing scientific evidence demonstrating the negative environmental impact of meat consumption.

“They would have to have studied it and sort of proven it for me to be convinced.” (Amy, 21)

Many participants stated that they would not reduce their meat intake for reasons relating to animal welfare, but would consider buying meat products with higher welfare standards. Most participants stated that they would be willing to reduce their meat consumption to promote better conditions for workers. Interestingly, many participants commented that although they

cared about issues relating to the environment or animal welfare, they did not consider these issues when shopping for food. Therefore, although many participants may be concerned about issues such as climate change, these concerns may not necessarily translate into corresponding food choices.

"I don't really pay much attention to it to be honest … I don't even notice where the foods come from that I'm buying." (Becky, 24)

13.4 Implications

The study found that meat consumption was an unquestioned dietary habit reinforced by social norms as well as by taste preferences and health concerns; most participants appeared to be unaware of the link between meat consumption and climate change; and participants were willing to reduce their meat intake, but mostly for health-related reasons.

The results have a number of implications. Firstly, they indicate that shifting current dietary habits away from meat consumption will not be easy, given that, for many, meat consumption is culturally ingrained and re-enforced by social norms from a young age. This suggests that interventions will need to shift societal perceptions, so that plant-based meals are also viewed as contributing towards a 'normal' healthy diet. The findings also suggest that interventions should focus on promoting plant-based meals as being healthy and tasty, so that participants do not feel as though they are compromising on these factors when opting to consume a dish without meat.

Secondly, the findings suggest that more needs to be done to communicate the environmental impact of livestock production for meat consumption to the general public, to raise awareness and understanding of the significant role that meat consumption plays in contributing to climate change. An effort also needs to be made to reduce scepticism, by raising awareness of the positive impact that eating less meat can have on mitigating climate change. It is possible that an increased awareness of this issue will increase participants' willingness to reduce their meat intake for environmental reasons, given that consumers with a greater understanding of the link between livestock and climate change are more willing to reduce their meat and dairy consumption compared to consumers who are less aware (Bailey et al., 2014).

Societal issues such as climate change tend to be secondary concerns for consumers, who instead prioritise factors such as health, cost or taste, which have a direct personal impact (Bailey et al., 2014). This suggests that interventions should focus on primary motivating factors such as health or taste, in addition to highlighting the negative environmental impact of meat consumption. The finding that participants would be the most willing to reduce their meat intake for health-related reasons suggests that focussing on the negative health impacts of meat would be a particularly effective strategy for encouraging consumers to reduce their meat consumption.

Finally, the findings from this study indicate that interventions need to be delivered in a way that makes issues such as climate change salient to consumers at the point of purchase, so that consumer attitudes can more readily be translated into behaviour. For example, interventions implemented in supermarkets or on online shopping websites could be effective in disrupting existing consumer habits and encouraging participants to engage in more

deliberative decision-making, whereby consumers can consider issues such as climate change, health or animal welfare when deciding whether or not to buy a meat product.

13.5 Limitations

It should be noted that the extent to which the results from this study can be extrapolated to explain societal views on meat reduction are limited, given the small sample size used. Furthermore, the fact that participants were all women means that the findings cannot explain male attitudes towards meat reduction given differences in the relative importance of meat in male diets, for example in forming masculinity (e.g. Rothgerber, 2013). Nevertheless, we hope that the findings provide an insight into public attitudes towards eating less meat as a climate change strategy.

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14 “Honestly, I don’t care about the environment”: How to motivate the amotivated

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Abstract

Interventions aimed at encouraging ecological behavior often assume that people are motivated to change their behavior. In this contribution, we want to draw attention to the notion that there is a substantial proportion of individuals that are *amotivated* to engage in ecological behavior. We conducted two online studies to demonstrate the prevalence of environmental amotivation, a disposition that is characterized by not caring about the environment and the polluting consequences of one’s behavior. Furthermore, we examined whether environmental amotivation predicts ecological behavior beyond other constructs associated with ecological behavior. Our results demonstrate that environmental amotivation predicts ecological behavior beyond environmental attitudes and psychological barriers to behavior change. In a third study, we experimentally varied the external conditions under which ecological behavior was executed by introducing a punishment system that puts a risk on not behaving ecologically. The punishment intervention significantly increased ecological behavior in individuals high in environmental amotivation. The results have implications for intervention planning as amotivated individuals are not likely to be reached by promoting environmentalism. Instead, we argue that punishment systems are a valuable means to influence behavior especially when the target population is environmentally amotivated.

14.1 Predictors of ecological behavior

Ecological behavior is a broad construct that encompasses all forms of behavior that serve the pursuit of sustainability, therefore “meeting the needs of the present without compromising the ability of future generations to meet their needs” (World Commission on Environment and Development, 1987, pp. 24-25). The ecological dimension of sustainability is often measured by the extent to which natural resources are exhausted. Therefore, ecological behavior can be assessed by asking or observing how often people engage in behaviors that save resources (e.g. by taking showers instead of baths or by commuting by public transportation or bike).

To explain why individuals perform ecological behavior to a varying degree, a variety of constructs has been suggested. One of the most studied are presumably environmental attitudes that express “the tendency to evaluate the natural environment with some degree of favor or disfavor” (Milfont & Duckitt, 2010, p. 80). On average, people report rather positive environmental attitudes (Dunlap, Van Liere, Mertig, & Jones, 2000; Lavergne & Pelletier, 2015). Positive environmental attitudes in turn are assumed to predict the performance of ecological behavior (Gatersleben, Murtagh, & Abrahamse, 2014; van der Werff, Steg, & Keizer, 2013; Whitmarsh & O’Neill, 2010). However, resource consumption has increased constantly over the last decades. In fact, according to the Global Footprint Network (2018), to outweigh the impact that humanity has on the environment in terms of resource consumption and waste disposal, we would already need 1.7 planets today. If all people lived like people

in Germany, all resources the Earth generates in one year would already be exhausted by May (Global Footprint Network, 2018).

To explain the discrepancy between positive environmental attitudes on the one hand and increasing resource consumption on the other, the idea that structural or psychological barriers impede behavior change has been proposed. For example, the availability of public transport options influences whether someone uses the car to drive to work or takes the bus or train. Such external conditions influence the likelihood of ecological behavior to occur beyond environmental attitudes as they affect the costs associated with a specific behavior. Barriers to behavior change can also be psychological. For example, the impression that one person would not have any influence on a larger scale can interfere with the intention to behave ecologically. Other barriers include lacking knowledge on how to behave more ecologically or the belief that government or industry should make changes, not the individual (Gifford, 2011). Both, structural and psychological barriers are not negative predictors of ecological behavior per se, but aim at explaining the intention-behavior gap, the common finding that attitudes predict behavioral intention but only to a limited degree actual behavior (Bamberg & Möser, 2007; Moser & Kleinhückelkotten, 2017). The barriers approach therefore assumes that people are generally motivated to behave ecologically. They just do not act accordingly because of perceived or actual barriers.

In this contribution, we question this basic assumption by proposing another potential predictor of ecological behavior, that is, environmental amotivation. Amotivation is defined as a state where there is no intention to act (Ryan & Deci, 2000). The concept of amotivation is not new but routed in self-determination theory (SDT; Deci & Ryan, 1985) that provides a framework for different forms of human motivation. According to SDT, the state of amotivation can be associated with different processes: The first one is low perceived competence, the feeling that one is not capable of performing the behavior in question. The second is the belief that performing the behavior would not yield the desired outcome. And the third is not valuing an activity, that is, the behavior in question is simply not relevant for someone (Ryan & Deci, 2000). The concept of amotivation has even been applied to the environmental domain: In 1998 a scale was developed that assesses motivation towards the environment including amotivation (Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998). There is also an extended scale to measure environmental amotivation (Pelletier, Dion, Tuson, & Green-Demers, 1999). However, these scales only cover the processes of low perceived competence or perceived non-contingency associated with amotivation and describe the main characteristic of amotivation as helplessness (Pelletier et al., 1999). Amotivated individuals do not feel capable of performing a behavior or are convinced the behavior will not yield the desired outcome. Therefore, environmental amotivation as defined by Pelletier and colleagues depicts a concept similar to psychological barriers: Individuals would like to behave a certain way, but the feeling of incompetence or non-contingency impedes the implementation of the behavior.

Shifting attention to the third underlying process, we propose that amotivation that stems from not valuing an activity is an important and largely neglected predictor of ecological behavior. The aspect of non-relevance as a source of amotivation has been implemented in other fields like health (Hardcastle et al., 2015), sports (Shen, Wingert, Li, Sun, & Rukavina, 2010; Vlachopoulos & Gigoudi, 2008) or learning (Legault, Green-Demers, & Pelletier, 2006) but not in the context of ecological behavior. We therefore developed a scale to assess

environmental amotivation that stems from not valuing the environment, characterized by not caring about the polluting consequences of one's behavior. We propose that this disposition predicts ecological behavior: The more amotivated someone is, the less s/he should engage in ecological behavior.

It is important to note that we do not expect individuals high on environmental amotivation to feel helpless. Therefore, environmental amotivation should predict ecological behavior beyond psychological barriers like lacking knowledge or conflicting goals. Environmental amotivation is furthermore distinct from environmental attitudes, as it constitutes a broader disposition whereas attitudes are content specific. For example, someone could express a negative attitude towards nature but still care about the environment for other reasons like personal health. Therefore, environmental amotivation should predict ecological behavior beyond environmental attitudes.

14.2 Investigating environmental amotivation as a predictor of ecological behavior

The aim of our research was threefold: First, we wanted to demonstrate that there are indeed individuals with no intention to behave ecologically - individuals that can be described as environmentally amotivated. We developed a scale to measure the construct and assessed environmental amotivation. Second, we examined whether this disposition predicts the performance of different forms of ecological behavior.

We found a substantial proportion of the sample that can be characterized as environmentally amotivated (around 10 %). Environmental amotivation showed to be significantly associated with ecological behavior: The higher the reported environmental amotivation, the lower the predicted frequency of self-reported and observed ecological behavior. Importantly, environmental amotivation remained a significant predictor of ecological behavior when environmental attitudes or psychological barriers were controlled for.

14.3 How to motivate the amotivated

The third aim of our research is to examine how environmentally amotivated individuals can be influenced to perform more ecological behavior. Given that environmental amotivation appeared as strong predictor of ecological behavior, it seems crucial to design interventions aiming at "motivating the amotivated". Many interventions assume that people are already motivated to behave more ecologically. For example, pointing out consequences of (over-) consumption like pollution of the environment or deforestation requires a certain interest to avoid these consequences to initiate behavioral change. We tried to increase ecological behavior especially in amotivated individuals. As not caring about environmental issues is the core of environmental amotivation, amotivated individuals are not likely going to change their behavior after interventions that promote environmentalism.

Instead, we propose to weaken the influence environmental amotivation has on behavior. We built on the idea that attitudes and motivations are *more* predictive of behavior when the costs to perform the behavior are *low* (Diekmann & Preisendörfer, 2003). Applying this logic, we expect to *weaken* the influence of environmental amotivation on behavior by *increasing* the costs of non-ecological behavior. In our research, we installed external incentives to behave ecologically by introducing a punishment system that puts a risk on not engaging in

ecological behavior (e.g. a certain risk that participants would not get a bonus payment if they decided not to donate to an environmental issue). Importantly, on average people would still earn more if they decided to keep the money and not to donate. The probability to donate was strongly associated with the degree of environmental amotivation that people reported: Those high in environmental amotivation were less likely to donate than those low in environmental amotivation. As expected, introducing a punishment system increased the probability to donate, also in individuals high in environmental amotivation.

14.4 Implications for environment protection interventions and policies

Many interventions that solely aim at overcoming structural or psychological barriers to behavior change presume that people are motivated to behave ecologically. However, as our research demonstrates, it is too simple to assume that all people are generally motivated to contribute to the protection of the environment. Therefore, practitioners should design interventions aimed at increasing ecological behavior that match the level of motivation the target population possesses.

On the one hand, intrinsic motivation is possibly the most important factor in predicting long-term behavior change. Unfortunately, there is lack of evidence on how to promote positive motivation (Kaiser, Kibbe, & Arnold, 2017). Additionally, promoting positive environmental attitudes does not necessarily lead to corresponding behavior. There is convincing evidence that environmental attitudes predict behavioral intentions but not actual behavior (Bamberg & Möser, 2007; Moser & Kleinhückelkotten, 2017). We therefore tested the effect of a punishment intervention on the performance of ecological behavior and found that it increased ecological behavior in those high in environmental amotivation. This result replicates the findings of other studies that evaluate external incentives as an effective means to influence ecological behavior (cf. Bell, Greene, Fisher, & Baum, 2001; Steg, van den Berg, & de Groot, 2012).

An advantage of installing a punishment system is that individuals do not have to think about which behavioral alternative could be the best in terms of environmental impact. In the real world, people are faced with an infinite number of behavior choices that each potentially have an impact on the environment. Punishment serves as a clear signal to identify the desired behavior. If the aim is to reduce the negative impact on the environment, punishing non-environmentally-friendly behavior is a means to directly influence behavior- regardless of whether people want to protect the environment or not.

Of course, installing a punishment system comes with costs for monitoring behavior and executing the punishment. However, our results demonstrate that punishment does not have to be executed every time the undesired behavior is performed to be effective: In our study, only a certain percentage of transgressions was actually sanctioned. Therefore, on average it would still be worth risking the punishment and getting away with it in most of the cases. However, the mere risk of being punished had a large effect on increasing ecological behavior.

To conclude, we recommend considering the installation of punishment systems to put a risk on behavior that is not environmentally friendly. This seems especially important considering our result that a substantial proportion of the population can be characterized as environmentally amotivated. In general, we advise to examine the state of motivation that the

target population possesses and tailor interventions accordingly to have a chance of motivating the amotivated.

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15 Catalysts and barriers towards a sufficiency-oriented society – an expert interview study

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Abstract

Sufficiency – the idea of strictly reducing individual and societal consumption to an ecological compatible level – is still an unpopular term. For a long time, the term sufficiency has been used as a buzzword to merely trigger feelings of loss, often referring to sacrifice beloved consumption habits. The concepts' inherent demand to give up consumption practices, such as long-distance flights for vacation or the consumption of animal-based food, refers to our convenient ways of life and appeals to its radical change – a change many people may not voluntarily choose as an option. However, as climate change is becoming more urgent, the notion of "reduction" or "deconsumption" is no longer a total taboo (Reese, Drews, & Tröger, 2018). Researchers, activists, and practitioners have recently begun to implement sufficiency strategies. The "zero-waste-movement" and its inherent critique of plastic waste serve as visible examples. In these domains the idea of sufficiency is realized without explicitly framing and naming it in terms of sufficiency.

After years of monitoring Germans' positive attitudes towards nature and the natural environment (for example Nature Awareness Studies by the Federal Agency of Nature Conservation conducted continuously in a two year period; publications available for studies 2009 to 2017), we still face the challenge of how to translate positive attitudes into collective and individual action towards a sustainable future. Sufficiency may serve as a vision or framework here. But to enable or implement it into political actions, we need to understand its catalysts and barriers.

In this research project we assess experts' viewpoints on sufficiency as a driving force for a socio-ecological transition. Moreover, we seek to detect current catalysts and barriers within society that may hinder or facilitate a sufficiency-oriented society. Specifically, we interviewed experts from science, politics, and economy as they are important stakeholders within our democracy and are often addressed by the respondents of the nature awareness studies to take action.

In this report, we outline the research background comprised of assumptions about the so-called intention-action gap. We will also reflect upon *sufficiency* as a more radical approach to solve current socio-ecological challenges. Afterwards, we point out selected research questions for this report and introduce our qualitative methodological approach briefly. First findings of this explorative expert interview study allow us to introduce a change model and to describe some categories we identified in the material. Finally, we suggest ideas on how to apply the model in practice.

15.1 Intention-action gap: High problem awareness, little impact-oriented behaviour

The European heat wave in 2018 was a clear sign that we are in the middle of a changing climate (IPCC, 2018). For decades, reports on the risks of climate change have highlighted the urgency to take action towards a societal transformation. For instance, in 2011, the German Advisory Council on Global Change (WBGU) highlighted the need for a „Great transition“ in order to tackle the global environmental and societal crisis. Nevertheless, emissions in Germany remain high, impeding progress on achieving the goals of the 2015 Paris agreement (see Umweltbundesamt, 2018).

Although we are aware of the climate crisis it seems as if we do not know how to behave in ways that enable a sustainable future. Since 2009, national surveys such as the “German Nature Awareness Study” underline that Germans perceive nature conservation to be a central issue. In the 2015 update, 93 per cent of the population strongly or at least somewhat agreed that it is our “*duty to protect nature*”. Also, over 90 per cent approve of the general principles of sustainability (“*We may use nature in such a way that affords coming generations the same opportunity*”). However, when people are asked how personally responsible they feel regarding nature protection and conservation, agreement rates diminish. Only 24 per cent explicitly acknowledge their personal responsibility and 47 per cent agree somewhat. Besides this lower rate of explicitly formulated individual responsibility to act, people very clearly attribute responsibility to political stakeholders (86 per cent of the respondents from the 2015 Nature Awareness study).

We still face the challenge to bridge the gap between strong positive attitudes regarding environmental protection and actual impact-relevant behaviour that decreases environmental impact (Bamberg & Möser, 2007; Kollmuss & Agyeman, 2002; Moser & Kleinhückelkotten, 2017). Recent findings add some alarming insights to these findings: high environmental impact is best predicted by income and correlates *positively* with environmental identity. In other words: individuals advocating sustainability and a sustainable lifestyle often have bigger ecological footprints than others (Moser & Kleinhückelkotten, 2017). This raises the question whether more radical strategies such as the sufficiency approach should be considered to downsize footprints of high-emission countries (cp. Lettenmeier, Liedtke, & Rohn, 2014).

Pointing on politicians to commit climate actions reveals another dilemma. On the one hand, people are motivated and share values of nature conservation flanked with the clear announcement that politics should take action. On the other hand, politicians notice that people do not exercise their responsibility even though they state that they value nature protection. Perhaps there is a mutual responsibility attribution: individuals want politics to set the right frames to empower people to act ecologically, but politics do not apply the right incentives as people do not act consistently with their ecological values.

We argue that we need a better understanding of the broader societal barriers to adopt sufficiency-oriented lifestyles and the catalysts that enable and accelerate such a transformation. This expert study aims to advance this understanding.

15.2 Calling for a sufficiency perspective as inspiration for change

The word *sufficiency* stems from the Latin word “sufficere” and means “enoughness”. In the context of the sustainability debate, it aims to minimize absolute consumption through less demand of goods and services that require a certain high level of resources. Sufficiency implies a “modification of consumption patterns that help to respect the earth’s ecological limits, while aspects of consumer benefit change” (Fischer & Grießhammer, 2013, p. 5). In contrast to efficiency and consistency, sufficiency questions individual and societal needs that are currently used to justify current high levels of consumption. Sufficiency, in contrast, does not try to fulfil them with less (efficiency) or substitutable (consistency) resources.

Wolfgang Sachs was one of the first to introduce the term into the sustainability debate. He argues that sufficiency is a key concept and the necessary counter-part for efficiency strategies (Sachs, 1999b, 1999a). In contrast to efficiency and consistency approaches[3], which are widely accepted and part of political agendas, sufficiency is often ignored in the public sustainability debate. One could argue that sufficiency is merely a question of individual behaviour and may be suitable only for a few people who voluntarily like to restrict their consumption. Hence, setting certain thresholds for consumption seems to be unrealistic, unfair, as also hard to measure unambiguously from environmental economic perspectives (see for instance on that critics from economic and political viewpoints van den Bergh, 2011). Although, these aspects need to be considered well, we face the problem that efficiency and consistency strategies – strategies that relate with the dominant economic growth paradigm –alone cause rebound effects and are not able to reduce emissions adequately. Technical savings are “eaten up” by increased consumption (Arnold & Otto, 2013; Santarius, 2014; Santarius & Soland, 2018). For example, modern household devices require much less energy as their predecessors. However, current trends show that the amount of electrical devices in households still increase, so that energy savings of single device become insignificant (Steinemann et al., 2013) Therefore, the general idea of sufficiency seeks to establish “alternative behavioural schemes such as repairing or recycling, and replaces resource intensive cultural practices […] whilst still satisfying certain needs and consumer benefits that lie behind the desire of consumption itself” and therewith decrease total emissions (Speck & Hasselkuss, 2015, p. 5). Supporters of the sufficiency strategy also highlight general personal and societal well-being through consuming less (Linz, 2004, 2012; Linz et al., 2002; Paech, 2013; Rosa, Paech, Wittmann, & Kirschenmann, 2014). A sufficiency orientation frees individuals from the duty to consume, and releases time and space for behaviours that contribute to the reduction of ecological footprints (see Rosa et al., 2014).

In sum, the sufficiency concept serves as a vision to limit climate change and is a prerequisite for the transformation toward a socio-ecologically just society. Considering the intention-action gap, the following questions need to be asked: How can a sufficiency-

[3] Consistency seeks to apply substances and technologies that are in accordance with nature. It aims for closed nature-compatible cycles of production and consumption and therewith contributes to sustainability.

orientation be upscaled in various societal areas? How can people be motivated to act sufficiency-oriented while not feeling as if they are restricting themselves? Which policies are compatible with the idea of sufficiency and may trigger a transformation towards a sufficiency-oriented society?

15.3 Selected research questions of the expert interview study

We selected the following questions to focus on within the present report:

a) Which barriers do sufficiency experts from science, politics, and economy identify for a change towards structurally embedding sufficiency-orientation into society?

b) Which visionary features should a sufficiency-oriented society include, according to the experts?

c) Which catalysts and key factors do our experts formulate? Where do experts see conflicts and ambiguities that prevent such a fundamental societal change?

15.4 Methodology and expert definition

This research project follows a qualitative approach of expert-based and problem-orientated interviews. Our main goal is to analyse, characterize, and conceptualize the field of transformation research concerning the sufficiency approach in particular. In the end, main catalysts and barriers towards a sufficiency-oriented society will be identified. Therefore, we deemed it necessary to interview experts who can help to define the research field and give broad insights on the whole spectrum of the research problem.

Experts were chosen who either had a high reputation considering the research field or were experts for specific themes or niches that are relevant for a better understanding of sufficiency-orientation. They came from different areas like academia or politics, which are fundamental to analyse respective catalysts and barriers. We also interviewed people who can best be described as entrepreneurs and innovators who have business ideas to support ways of life that are compatible with the sufficiency approach. Most of our experts were scientists (13 participants), followed by politicians (5 participants), and actors in business and economy (3 participants). All of them were based in a German context.

The interviews were semi-structured and started with an opening question, asking the experts to state their conceptions of sufficiency- versus efficiency-oriented behaviour in general. Afterwards, experts assessed the status quo regarding the implementation of the sufficiency concept in our society. Later, experts elaborated on their visions about a sufficiency-oriented society. Our methodological consideration was explicitly to ask participants about future narratives because imagining the future frees ideas on how to change the present (Weigert, 2014). Afterwards experts talked about catalysts towards such a transformative change. The interview ended with a question about political implications of a coalition agreement. This question was relevant as our interviews took place during and after the formation of the grand coalition agreement in Germany (Spring 2018). Overall, duration of the interview was restricted to 30-45 minutes.

Interviews were transcribed and analysed following qualitative content analysis (Mayring, 2015). We formulated codes and categories out of the material itself (inductive approach).

The aim of this analysis was to find generalizable assumptions within the individual statements by looking at similar topics the respondents talked about, and the use of words or anchor points they often referred to. We aim to identify significant similarities between the interviews, create thematic clusters, and try to detect the inherent links between them.

15.5 First insights into the expert's views: hypothesising a model of change

The present chapter gives an exemplary insight into first categories that emerged from the material. We introduce a first *working model of transformation towards a sufficiency-oriented society* (see Figure 21), interrelating the categories that emerged during the interviews. The analysis of the interviews is not completed yet, and all presented results are based on first preliminary findings of our gathered material.

In the opening part of the interviews, experts evaluated the current status of sufficiency-orientation within German society; their statements served to categorize barriers (see Figure 21). Afterwards, experts formulated their vision of a sufficiency-oriented society and suggested possible policy measures for future political decision-making.

Remarkably, answers interrelate with each other and albeit describing the status quo, experts immediately stated what they perceive to be core barriers or pathways to change the status quo, without having been prompted to do so. This indicates that conceptions of sufficiency and the transformation are highly interrelated and systemically complex. In the following we present examples of experts' statements and first hypotheses regarding its interrelations.

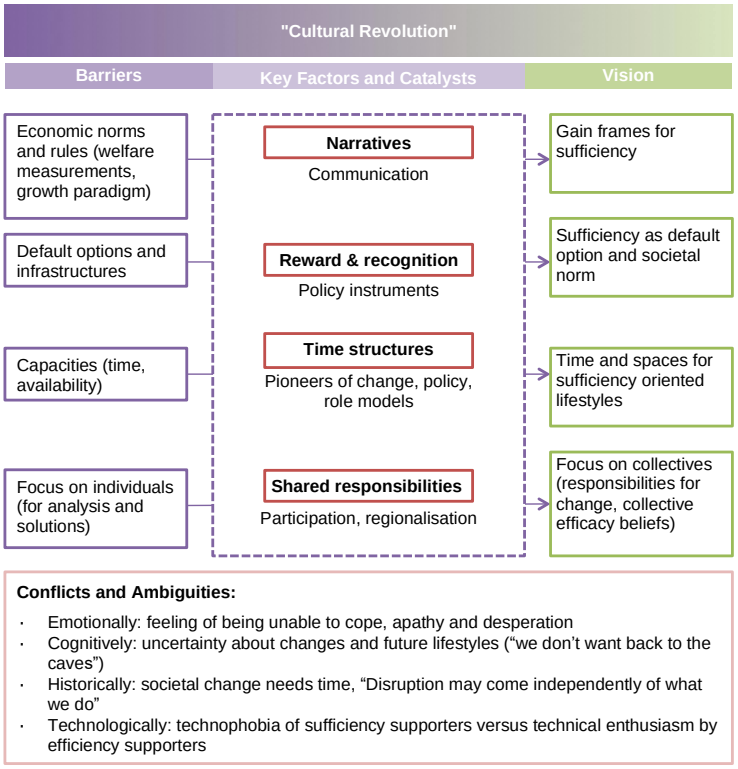

Figure 21: Exploratory working model derived from inductive categories on barriers, key factors and catalysts, as also experts' visions towards sufficiency-oriented society.

15.5.1 Barriers

Experts judge economic norms, such as welfare measurements and growth dependency, as barriers that prevent change from happening. It is a common belief that growth is the only way to create wealth and to be competitive in (global) economic markets. This is deeply internalised in our behaviour and shapes the "mindsets" of many players in our society. Experts perceive alternative economic models, for instance, an economy based on the common good ("Gemeinwohlökonomie") or post-growth to be debated only in niches of science but not in politics or everyday life. Especially for experts from the economic sector, it is an open question how to establish a sufficient company that wants people to reduce their consumption – or at least shift consumption habits from buying to only actually using or sharing. However, some entrepreneurs already implement the idea of sufficiency and try to offer services that decrease total material consumption, such as lending clothes to decrease material consumption. One expert who is familiar with lending clothes to consumers stated that people need windows of opportunity to facilitate making new consumption experiences and to experience how it feels to share instead of buying something. Establishing such alternative services within a company and make them usable for consumers, in turn, needs time and persuasive efforts.

Furthermore, *default options* for people's choices are rarely ecological ones. Though there is societal consensus about environmental protection, technical devices and default settings do not prioritize ecological options. Printing double-sided is usually not the default setting of printers, as an example. To the contrary, individuals have to actively switch and afford time and money to choose the ecological options. Experts state that it does not take costlier additional effort by producers and developers to implement those changes. Mobility, for instance, was named as one of the biggest challenges in this sense. All respondents highlighted that ecological mobility needs to be prioritised over fossil-based mobility concepts. Ecologically friendly investments into bicycle tracks and infrastructure, beside other green mobility concepts, will give people incentives to change mobility behaviour patterns and support cleaner cities and healthier lives.

Experts further judge individual time restrictions and lack of availability of ecological alternatives as core barriers. It is a question of time and flexibility to produce one's own vegetables at home and there are only a few people who would or are able to reduce their working hours from full-time to part-time to reallocate time resources. Most of the people are in "locked-in" structures, which limit freely available time very strictly. The following quote exemplifies it:

"I pursue the goal to act in an eco-sufficient manner. However, 80% of the relevant decisions do not match this goal as I commute to work a very long distance every day and cannot use sufficient mobility. [...] The question of which path dependencies there are is highly relevant, especially in case of time contingents people have to do certain things. I realize this in my personal life, that time is very important and mainly leads to the fact that I live less sufficiency-oriented than I would like to."

Furthermore, the experts see a focus on individual activities and behaviours as barriers. In the discourse, and also in research on how to tackle climate change, individuals are seen as decisive. However, their embeddedness into societal and collective structures is seldom considered. The following statements serve as examples:

“The majority of policies and initiatives in the name of sustainable consumption focus on changing unsustainable habits and products here and there, taking a relative approach, looking for relative alternatives. This leads towards the assumption that (1) one can buy sustainability and efficient products and (2) to the impression that one has to be financially well off and this belief became mainstream thinking.”

“The private sphere is what we constantly address. Buy eco-efficiency cars – this makes you happy and you do not care for the environment anymore.”

Individualized perspectives are guiding principles within many societal areas but prevent collective changes. To this day, group dynamics and the influence of (peer) groups on individuals are only marginally considered in the public environmental protection debate.

15.5.2 Vision

Experts describe fundamental changes with reference to present societal barriers and indicate some fundamental *mental* shifts in how we talk about and frame sufficiency:

„In my opinion, it would be a cultural revolution. I think it would mean another logic within our society. [...] These growth-oriented life-styles that are based on the idea of more, faster, higher, need to be changed completely.”

Respondents describe ecological sufficiency as a guiding principle when transforming infrastructures for services or production. For instance, experts imagine preferences for bike lanes in cities and stricter ecological production standards. In their visions, they also highlight that people have enough time and space to realize sufficient lifestyles, and that these lifestyles are valued in their respective communities. Furthermore, the role of collectives and communities has changed towards increased participation and regionalization. Establishing regional circuits of consumption and production (e.g. regional food, renewable energy) could serve as an example.

15.5.3 Keys and catalysts

We derived four keys from the interviews, namely *Narratives, Reward* and *Recognition, Time Structures,* and *Responsibilities*. Related c*atalysts*, such as *communication, policy instruments or participation* (see Figure 21) should to be understood as mechanisms or tools that would work in favour of these keys.

Experts agreed that changing *narratives* would be powerful, such as ways of communicating about climate change and its causes. Transparency and honesty were named as drivers that could guide a better comprehension of sufficiency. How current lifestyles are communicated to people needs to be reframed, like: *“Travelling makes you smarter and educates you. This is a contra productive narrative.*”

In case of *Reward and Recognition* experts emphasize that ecological choices need to be rewarded by the community. Economic incentives need to be given, for instance implementing carbon pricing, which would support ecologically friendly choices and sanction ecologically unfriendly behaviour. This quotation highlights how incentives could change in favour of ecological choices:

“Costs of behaviour are very much less for environmentally unfriendly behaviour. As we see in case of flying: it is cheap, it is fast, and it is possible! Even the eco-concerned people choose this option. This is a psychological intervention - but the other way around and with the wrong target behaviour. Self-efficacy for flying increased extremely.”

15.6 Implications for practice and policies

As climate change awareness is high within German society, we need to ask the question on how to empower people to reclaim the future as one that is worth living. The proposed change model points out important structural barriers that can be addressed and targeted for such a change towards a positive future. It envisions sufficiency as anchored in various societal areas and proposes ideas about keys and catalysts towards change that would be of interest for politicians and practitioners alike.

(1) The model serves as an inspiration and example for questioning yourself or your project partners in this three-step-manner: a) What does the present look like regarding sufficiency-orientation? b) What could it look like in the future? c) And how and by means of which “tools” could this future be enabled? Focusing on superordinate goals is necessary to motivate for broad long-term goal achievement in many areas of life (Höchli, Brügger, & Messner, 2018) – and potentially helps to find solutions for the climate crisis. It matters how we envision a future society because it facilitates changing activities in the present and committing to actions in the future (Miller, 2015).

(2) The model can be used as a reality check and as a framework for future projects. For instance, practitioners could ask: Which vision did we have within previous activities or projects? Which structural barriers prevent a certain (nature conservation) project to have a broader impact? Which of the named key factors and catalysts could be targeted in future projects? Have we thought about these barriers and catalysts in our current projects? Furthermore, pathways proposed by the experts could inspire computer-based simulations: How could a change of time structures such as general working time limits (six hours working day instead of eight) influence sufficiency-orientation and decrease ecological footprints?

(3) Our first results indicate that it would be of importance to tackle structural barriers rather than increase individual intentions in order to close the intention-action gap. Rather, we need to embrace existing intentions and empower people to act through appropriate structures. Social norms such as the economic growth orientation and infrastructures do not only interfere with bridging the intention-action-gap, but also set an overarching framework. They constitute the majority of options people can choose from and influence if people feel self-competent in really making a change. Moreover, the dynamics of groups and collectives should be integrated in science as well as practical projects encouraged by policies that give people free spaces for experiments and alternative approaches (e.g. “Reallabore” that were tested in the State of Baden-Württemberg).

Our research project seeks to increase the visibility on sufficiency approaches and clarify ways towards an ecological transformation. We need a vision of our future – *what could it look like to live in a decarbonised world?* – and try to understand which catalysts to use to accelerate necessary changes.

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Appendix: Program of the Summerschool 2018

Monday, 18th of June 2018

from 16.00 Arrival

18.30 Dinner

19.30 Welcome and introduction to the summer school
Andreas Wilhelm Mues (BfN) Gerhard Reese (University of Koblenz-Landau) Kathrin Bockmühl (INA)

20.00 Keynote I: When and how is interacting with nature good for us? Birgitta Gatersleben (University Of Surrey)

Tuesday, 19th of June 2018

08.00 Breakfast

Research Presentations 1

09.00 The intention bias: The influence of the intention underlying a behavior on its perceived environmental impact.
Gea Hoogendoorn (Swiss Federal Institute of Technology in Zurich)

Honestly, I don't care about the environment: Introducing environmental amotivation as predictor of ecological behavior
Laila Nockur (University of Ulm)

10.00 Factors Underlying Diets with Varying Environmental Impacts and Barriers to Positive Change
Emily Wolsterholme (Cardiff University)

Why We Are What We Eat: Ambivalent (Un-)Sustainable Dietary Practices Are Maintained by Moral (Dis-)Engagement
Benjamin Buttlar (Univeristy of Trier)

11.00 Coffee Break

11.15 When do we persevere and when do we slack off? Regulatory focus moderates the self-licensing versus behavioural consistency effect.
Fanny Lalot (University of Geneva)

Reviewing Basic Psychological Needs and Their Relations to Pro-Environmental Behavior: The Role of Self-Protective Strategies
Marlis Wullenkord (University of Koblenz-Landau)

12.15 Lunch

13.30 Guided tour on Vilm Island with Kathrin Bockmühl

15.15 Keynote II: Social identity and the environment: How group identities can help or hinder environmental action
Kelly Fielding (University of Queensland)

16.15 Coffee break

Workshops 1

16.45 Workshop phase I:

Kelly Fielding: The focus of this workshop is on developing research and intervention ideas of how to use social identity strategies to promote environmentally significant action.

Christian Klöckner: This workshop will analyze together with the participants pathways of making environmental communication work.

Birgitta Gatersleben*:* The workshop will critically review theory and research evidence on environmental restoration to examine what an environment that supports both human wellbeing and environmental quality may look like.

18.30 Dinner

20.00 Informal Discussion

Wednesday, 20th of June 2018

08.00 *Breakfast*

09.00 Keynote III: Making people change - successes, pitfalls and new pathways of pro-environmental communication.
Christian Klöckner (Norwegian University of Science and Technology)

Research Presentations 2

10.00 The multisensory experience of environmental art as an intervention to increase the connectedness to nature of adolescents
Julian Sagert (University of Potsdam)

Voluntary non-consumption of clothing: prevalence and motivations
Tina Müller (Copenhagen Business School)

11.00 *Coffee break*

11.15 The Pro-Environmental Behavior Task: A laboratory measure of actual pro-environmental behavior
Florian Lange (Catholic University of Leuven)

11.45 *Short Presentation:* How to bridge the intention behaviour-gap and promote a societal change? A qualitative interview study with experts from science, politics, and economy exploring the transformative potentials of sufficiency
Josephine Tröger (University of Koblenz-Landau)

Short Presentation: The Social Identity Model of Pro-Environmental Action (SIMPEA)
Parissa Chokrai (University of Leipzig)

12.30 *Lunch*

Workshops 2

14.00 Workshop phase II (continuation of phase I; changing to another workshop is not possible) – with Kelly Fielding, Christian Klöckner & Birgitta Gatersleben

16.00 Coffee break

Workshops 3

16.20 Workshop phase III (continuation of phase II; changing to another workshop is not possible) – With Kelly Fielding, Christian Klöckner & Birgitta Gatersleben

18.30 Dinner

20.00 Informal discussions

Thursday, 21st of June 2018

08.00 Breakfast

09.00 Workshop presentations

10.00 Coffee break

10.15 Summerschool evaluation

11.30 Departure (Ferry 12.05)