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Empathic concern as a motivation to increase pro-environmental attitudes and behavior

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Contents

Abstract

Adopting pro-environmental behavior, broadly defined as sustainable and conscious handling of natural resources, is becoming an increasingly important necessity for everyday-life, in order to contain anthropogenic degradation of natural eco-systems. Such behavior is a multi-faceted, complexly motivated construct, mediated by environmental attitudes. This study aimed to examine whether inducing empathic concern by letting participants read the detailed account of people suffering from environmental deterioration could be used to increase pro-environmental attitudes and behavior. Furthermore, it was analyzed whether the individual tendency to discount future rewards was significantly related to displaying pro-environmental attitudes and behavior. A 2x2 mixed factorial design with pre- and post-test was implemented, instructing participants to empathize while reading in the experimental condition, and to stay objective in the control condition. Changes in the administered Environmental Attitudes Inventory (EAI), and participants deciding to pick either a conventional or a bio-degradable paper cup served as dependent variables. Overall environmental attitudes did increase in the empathy condition, though only displaying a small effect size. This may be attributed to a comparatively weak spillover, as for EAI items conceptually related to the specific topics addressed in the provided text, increase in pro-environmental attitudes was more distinct and also independent from different conditions. Furthermore, experiencing personal distress was a better predictor than experiencing altruistic empathy, for changes in environmental attitudes. Though, also unrelated to the different conditions, a significant amount of participants picked a different cup after reading the text than before, the data are not conclusive whether the predominant motivation for this really was to act in a pro-environmental manner. Additional research should be conducted to further clarify this

matter. Finally, individual parameters of discounting future rewards were not significantly related to any variables denoting environmental attitudes or behavior.

1. Introduction

1.1 The necessity of "going green"

Only when the last tree has died

and the last river been poisoned

and the last fish been caught

will we realize we cannot eat money.

Alleged 19th century Cree Indian proverb, popularized by Greenpeace

Within the last few decades it has become a generally acknowledged fact that (industrialized) human behavior has a major impact on delicate ecosystems, and that the exploitation of such ecosystems ultimately entails severe damages on a global scale, such as in the form of loss of biodiversity, shortages in freshwater availability, air pollution, climate change and frequent occurrences of natural disasters (Vlek & Steg, 2007), to name just a few. The fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC, 2007, p. 3) states with "very high confidence that the global average net effect of human activities since 1750 has been one of warming" and that numerous unequivocal long-term changes in climate have been observed, including changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather, such as droughts, heavy precipitation, heat waves and the intensity of tropical cyclones.

While causal links between environmental change and human health often are complex because they tend to be indirect and depend on many varying factors (WHO, 2005), it still is closely documented that such ecosystem disruption results in many negative consequences for human beings. For instance, recent World Health Organization reports

(WHO, 2005, 2009) conclude that urban air pollution causes 1.2 million deaths each year, and furthermore, diseases and infections caused by contamination or lacking of water supplies claim up to 5 million lives per year, mediated by shifting rainfall patterns and increased rates of evaporation.

Evidently, there are many different ways in which human behavior ultimately poses a threat to environmental sustainability by affecting the resilience of the environment. However, it can be argued that a common denominator for many different causes of anthropogenic environmental deterioration is thoughtless consumption. For example, this can manifest itself as excessive fuel or electricity consumption, unnecessary water usage, a tendency to purchase and later on, dispose of large amounts of mostly non-degradable products, and other similar behavior patterns (e.g. see Boyes & Stanisstreet, 2012; Steg & Vlek, 2009).

Correspondingly, there also are many different approaches for acting in such a manner as to let the environment benefit. Stern (2000) distinguishes between two classes of pro-environmental actions: indirect, public sphere environmentalism and direct, private sphere environmentalism. On the one hand, public sphere pro-environmental behavior often consists of large-scale actions aiming to influence public policies by raising awareness or publicly supporting environmental activism, such as petitioning on environmental issues or contributing to environmental organizations. On the other hand, private sphere pro-environmental behavior basically refers to conscious purchasing and usage of personal household- and consumer goods on the individual, small-scale level. In contrast to public environmental actions, private sphere pro-environmental behavior directly influences the environment; yet the impact of one individual person's behavior, taken by itself, is relatively small (Stern, 2000).

Nevertheless, only few people are in positions of power where they can directly influence government or corporate policy, but all humans have to consume material and energy on a daily basis, allowing virtually everyone to adopt more conscious consumption patterns and thus a more sustainable lifestyle (Osbaldiston & Schott, 2012). Hence, the interplay between public and private environmentalism is important. It is crucial that decision makers in a public context - who in this case can be defined as government employees, researchers, teachers, organizational leaders, etc. – encourage and promote pro-environmental actions, in order for many people to acquire and maintain sustainable behavior patterns, which in aggregation significantly have an impact on the environment.

1.2 The emergence of environmental awareness

Today, publicly advocating pro-environmental behavior has become quite common, and to do so - one gets the impression – to a certain extent resembles preaching to the already converted. Public environmental concern and social awareness first arose in western countries in the late 1960s and early 1970s, partly as result of a general cultural pessimism and partly because of the 1973 oil crisis (Grunert & Juhl, 1995). Since then, public environmentalism has become a universal, somewhat populist phenomenon, while its main emphasis has gradually shifted from seeking solutions in politics to focusing on individual consumer purchase behavior (Roberts, 1996).

Accordingly, general levels of environmental awareness seem quite high, consulting data gathered in representative surveys from Western Countries. For instance, results of the "American Environmental Survey" (ecoAmerica, 2006) suggest that 86% of US-Americans tend to express general concern about environmental issues. Similarly, according to an "environment survey" conducted in Switzerland (Diekmann & Meyer, 2007), 79% of the Swiss population consider environmental pollution as a very important problem, and 82% state that the greenhouse effect and global warming pose serious threats

in their opinion. In summary, the majority of citizens reports to support sustainable policies and programs and to have deep respect for the environment (McConochie, 2011). Moreover, observed high values on self-reported environmental concern aren't limited to Western Countries, but rather seem to be a phenomenon appearing almost universally throughout the globe (Inglehart, 1995). It has been proposed though that the quality and deepness of reported environmental concern positively correlate with factors such as affluence and, directly linked to that, higher "postmaterialist" values (Franzen, 2003; Inglehart, 1995; Kidd & Lee, 1997). However, the exact relation between environmental attitudes, wealth and cultural values has not yet been determined and is still somewhat subject to debate (Brechin, 1999; Running, 2012), with some researchers arguing for relative equality of environmental concern throughout different countries, regardless of national material conditions (Dunlap & York, 2008). Recent cross-national, multilevel analyses suggest that (1) environmental concern basically seems to be independent of a country's level of globalization (Mostafa, 2012); (2) however, local environmental degradation is an important predictor for environmental concern (Knight & Messer, 2012), and most important, (3) environmental concern itself is multifaceted, consisting of many different dimensions, both at the individual and national level, and therefore cannot be sufficiently explained by only one single cause (Knight & Messer, 2012; Marquart-Pyatt, 2012).

1.3 From attitudes to actions

Taken together, the widespread international awareness and support for environmental causes may lead to the impression that in the 21st century the implementation of pro-environmental behaviors has become a fully automatic, self-managing progress gradually leading to global amelioration of the condition of natural ecosystems which had been damaged in decades before. That impression is only partly accurate. It is true that over the

years environmental policy making has led to many cases of hazardous pollution being resolved; examples include the discontinuation of using CFC in spray cans, introducing unleaded fuel, banning asbestos from building materials, and many more (Vlek & Steg, 2007). However, while the notion of acting environmentally friendly and its importance have indeed been widely accepted and to a certain extent politically supported, this does not automatically go along with actually carrying out the corresponding pro-environmental actions. A comprehensive meta-analysis (Bamberg & Moeser, 2007) revealed only moderate relationships between various psycho-social variables and pro-environmental behavior. Factors such as attitude, problem awareness, personal moral norms, and perceived behavioral control influence pro-environmental behavioral intention, which in turn accounts for 27% of the variance in environmentally friendly behavior. In accordance, a national survey conducted by Leiserowitz, Maibach, Roser-Renouf, and Smith (2010) indicated that many Americans preach, but don't practice pro-environmental behavior, meaning that many people stated to find certain actions important for conserving the environment, but only few reported to actually engage in those actions. For instance, data suggest that 72% of those questioned, believe using public transport or a carpool is important, but only 12% actually do so; and while 92% agree that it is a vital thing to do, only 46% actually try to reduce trash.

In the literature, the gap between the possession of environmental knowledge and environmental awareness on the one side, and displaying pro-environmental behavior on the other side, is a well-established phenomenon (Kollmuss & Agyeman, 2002; Leiserowitz et al., 2010).

Acting pro-environmentally is a complex, heterogeneous construct with many different causal factors. Various different variables have been proposed to at least partly account for the above mentioned gap between cognition and action, rendering it impracticable to

incorporate all those factors which shape and influence environmentally friendly behavior, in one encompassing model or diagram (Kollmuss & Agyeman, 2002). Apparently, the perceived proximity to related environmental issues, i.e. the extent to which individuals believe to be directly affected by those issues, plays a crucial role for acting in an environmentally relevant manner (Markle, 2011). Another very important factor mediating the realization of a pro-environmental action seems to be the personal cost associated with the behavior in question (Diekmann & Preisendorfer, 2003). Basically this means that attitudes are much more likely to lead to a behavior being performed, the more this behavior is low in costs, relatively convenient and easy to execute (Tobler, Visschers, & Siegrist, 2012). It has furthermore been argued that human behavior typically leading to damage in natural ecosystems has been evolutionarily imprinted by key ancestral tendencies, such as the desire for relative status or the proneness to disregard impalpable concerns (Griskevicius, Cantu, & van Vugt, 2012), thus making it more difficult to abandon detrimental behavioral patterns.

Finally, it can be concluded that pro-environmental behavior is a “social dilemma” or a “social trap”, the two terms being largely interchangeable. The expression “social trap” was first coined by Platt (1973), referring to a situation within a group or society, in which certain actions are beneficial for an individual and lead to short term personal gains, but in the long run, if these actions are excessively performed by many individuals, they have detrimental effects for the group and thus also for each single person. More specifically, acting pro-environmentally in modern society often resembles one certain form of social dilemma, namely the so called “tragedy of the commons” (Hardin, 1968), which is based on the assumption that commonly shared resources, to which everyone in a community has access to and everyone benefits from, sooner or later tend to reach a point at which they start to deteriorate as a consequence of unreasonably high depletion. Current practical

examples for that situation would be the overfishing of the seas or the massive deforestation of rainforests. It has been argued that the underlying core issue of social dilemmas is a psychological conflict between prosocial tendencies to cooperate, and the pursuit of maximum personal gain (Kaiser & Byrka, 2011). In that light, it seems plausible to view pro-environmental behavior in part as an intrinsically motivated, prosocial personality trait (Kaiser & Byrka, 2011; Tabernero & Hernandez, 2011). Concomitantly, it should be noted though that acting pro-environmentally cannot entirely be described as an altruistic, prosocial act, because lastly the person engaged in the activity does directly benefit from such behavior, merely not immediately but in a long-term perspective. Again, the choice of an individual to overfish or to cut down trees in the rainforest will seem perfectly rational and beneficial for the agent in a proximate time frame, yet ultimately, if a large amount of people displays that behavior, everybody in the group or society – including those who benefited at first - will suffer from the evoked negative consequences. Thus, the ability and willingness to show foresight and to incorporate the non-immediate future in one's thought process is likely to play an important role in behaving environmentally friendly (Corral-Verdugoa & Pinheiro, 2006; Kortenkamp & Moore, 2006).

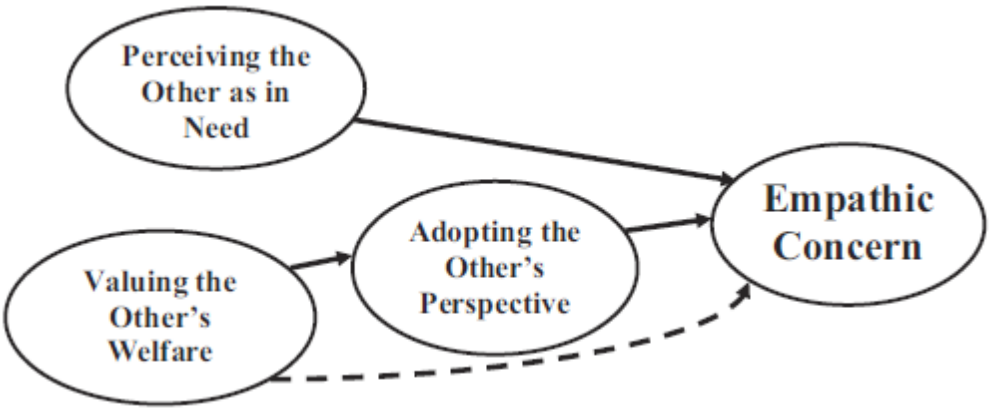
1.4 Empathic Concern

As has been discussed above, the ability or tendency to act prosocially can be expected to be an influential component of pro-environmental behavior. One major driving force – perhaps the most influential motivation – for acting prosocially is the experience of empathy, as indicated by a large body of research (e.g. see Batson & Shaw, 1991; Dovidio, Piliavin, Schroeder, & Penner, 2006; Hoffman, 2008). While there are many different definitions of empathy, it seems safe to assume that there are three core components which lead to its occurrence, first pinpointed by Decety and Jackson (2004): (1) an affective

response to emotions of others, which sometimes is believed to entail sharing the perceived emotional state (Lamm, Batson, & Decety, 2007), (2) adopting the perspective of another person, while at the same time (3) the ability to distinguish between one's self and others is maintained. Focusing on the affective response, Singer and Lamm (2009) clearly distinguish between empathy on the one side, and other, related concepts which are often used synonymously, on the other side, such as sympathy, empathic concern and compassion. Following this notion, empathy typically involves sharing isomorphic (i.e. the same) feelings with the observed person ("feeling with" someone), while the other terms refer to inherently other oriented emotions ("feeling for" someone). The authors continue to outline that experiencing empathy can be the beginning of a chain, involving affect sharing, followed by understanding the other person's feelings, which subsequently motivates other-related concern and finally engagement in helping behavior.In accordance with aforementioned models, it has been established for a considerably long time that one very substantial factor for inducing the feeling of empathy is perspective taking. Dating back to 1934, in the foreword of the influential work " Mind, Self, & Society" by famous sociologist and psychologist George H. Mead, man is described as "essentially the role-taking animal" (p. xxi), and the author later goes on to elaborately outline the "process of taking the role of the other" (Mead, 1934). 35 years later, Stotland (1969) for the first time experimentally examined the matter and found evidence that actively imagining the feelings of a suffering person enhances the reported vicarious apprehension and physiological arousal, as compared to when staying as objective as possible. Continuing this line of research, these findings have been replicated and further explicated (Batson, 1991; Batson, Early, & Salvarani, 1997; Batson, Eklund, Chermok, Hoyt, & Ortiz, 2007), and led to coining the term "empathic concern".

Empathic concern is described as an other-oriented emotional response elicited by and congruent with the perceived welfare of a person in need, it includes feelings of distress and sadness for that person (Batson et al., 2007). Although seemingly similar, those feelings are not to be confused with direct personal distress, which reflects a more self-oriented aversive emotional response of discomfort caused by witnessing the other suffer (Batson et al., 1997). There are certain preconditions which when met seem to elicit - or at least vastly facilitate - the occurrence of empathic concern (see figure 1). Firstly, it has to be recognized/acknowledged that the other person is in some kind of unfavorable situation. Secondly, importance has to be ascribed to the other's well-being, i.e. the person should not be perceived as disagreeable or deservedly being in such a situation. Finally, actively imagining how the other feels by adopting his or her perspective is also a direct and substantial antecedent of empathic concern.

Figure 1. The antecedents of empathic concern (adapted from Batson et al., 2007, Figure 1)



Any of the three specified antecedents can lead to empathic concern individually and independently, without the other two necessarily applying to the situation. However, valuing the other's welfare and adopting the other's perspective seem to be linked very closely, and the highest amount and most persistent level of reported empathic concern were achieved when all three preconditions were met (Batson et al., 2007).

Taken together, it can be hypothesized that inducing empathic concern via letting someone take the perspective of people who suffer from the consequences of environmental detriment might be a functioning and valuable measure to evoke attitudes and behavior more attentive and favorable towards environmental matters.

Notably, there has been an enduring scientific debate about whether empathically induced prosocial behavior is actually altruistically motivated or rather egoistically, respectively under which circumstancesaltruism or egoism might be predominant (Batson, 1991; Maner et al., 2002). Because within this debate solid evidence points toward empathic concern actually inducing a genuine altruistic motivation (Batson, Fultz, & Schoenrade, 1987; Stocks, Lishner, & Decker, 2009), this shall be assumed to be the case, although strictly speaking it makes only a negligible practical difference if empathically induced pro-environmental behavior is truly completely unselfish or not. The more so as acting in a manner beneficial to the environment usually includes a proximal prosocial component and at the same time a distal self-beneficial element, as has been illustrated further above.

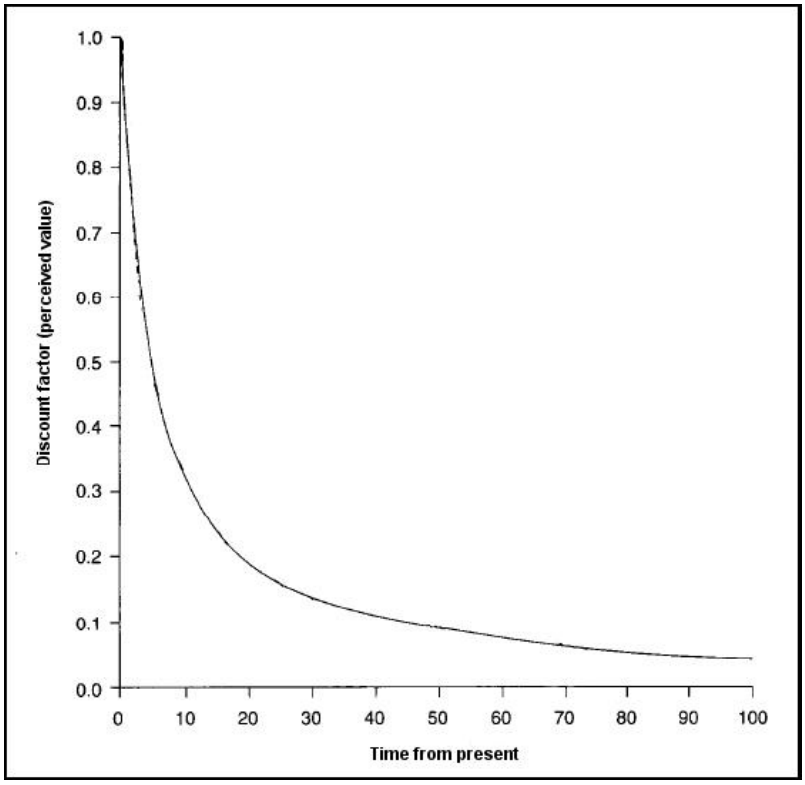
1.5 Temporal Discounting

To realize the self-beneficial component of pro-environmental behavior, one has to recognize and value non-immediate future results. It is a commonly known, almost self-evident fact that society as a whole discounts future costs and gains (Henderson & Sutherland, 1996). That is, basically, the further in the future a certain event lies, the less subjective weight is laid on its impact; with time having to pass, the perceived value decreases. Future gains are viewed as less beneficial than instant gains, and future losses are considered less serious than such ones that are immediate. This process is known as “temporal discounting” or “delay discounting”, the occurring changes in the ascribed value over time best fit a hyperbolic function (Henderson & Sutherland, 1996). Although this

seems to be universally true, each person tends to discount differently, resulting in interindividual variations in the steepness of decline of future values (Kirby, 1997).

It is assumed therefore that exhibiting a steep reduction in perceived value with increased delay might be a negative predictor for acting environmentally friendly or displaying pro-environmental attitudes. In other words, the less a present reward loses of its reported subjective value in the future, the more likely it might be that the concerned person is going to display environmentally friendly attitudes and behavior.

Figure 2. A graph depicting a hyperbolic discount rate with a typical initial steep decline and then gradual flattening of the curve (modified from Henderson & Sutherland, 1996, Fig. 1)



1.6 Scientific approaches to measuring pro-environmental attitudes and behavior

1.6.1 Assessing environmental attitudes

To account for individual attitudes concerning the environment poses the challenge of successfully recognizing and recording various different relevant aspects and elements, because attitudes themselves are a latent construct and cannot be measured overtly and

directly (Milfont & Duckitt, 2010). This is aggravated by the fact that there are several different terms regarding mindsets towards the environment, partly overlapping in their meaning. Therefore it is vital to define which particular aspects one wants to examine, respectively to be familiar with different underlying concepts and approaches.

In a broad sense, *environmental concern* can be described as "the degree to which people are aware of problems regarding the environment and support efforts to solve them and/or willingness to contribute personally to their solution" (Dunlap & Jones, 2002, p. 485). Similarly, Kollmus and Agyeman (2002) define *environmental awareness* as knowing of the impact of human behavior on the environment. To develop this, one has to gather a preceding basic *environmental knowledge*, being "a general knowledge of facts, concepts, and relationships concerning the natural environment and its major ecosystems" (Fryxell & Lo, 2003, p. 48). Ultimately, to which degree and under which circumstances somebody shows environmental concern depends on, respectively is mediated by, the values and attitudes of that person. Attitudes are a vital, indispensable construct in social psychology and can be defined as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken, 1998, p. 269); they usually refer to the information a person has about this particular entity (Newhouse, 1990). Following this logic, environmental psychologists have introduced the prominent concept of *environmental attitudes* as "a psychological tendency expressed by evaluating ... the natural environment … with some degree of favour or disfavour" (Milfont, 2007, p. 12); environmental attitudes can be viewed as a multidimensional construct related to value-based orientations (Milfont & Duckitt, 2006).

Consequently, this suggests a hierarchical model, in which environmental knowledge is necessary for environmental awareness, both together finally resulting in varying degrees of environmental concern, which comprises different environmental attitudes. It has to be

added that the terms *environmental concern* and *environmental attitudes* overlap significantly, so that they may be interchangeable to a certain degree. Indeed, many researchers seem to use these two terms synonymously (for an overview see Milfont, 2007).

The largest portion of methods devised for examining environmental attitudes rely on direct self-reports, i.e. interviews and questionnaires (Milfont & Duckitt, 2010), due to practical reasons such as feasibility or economy. Over the years actually many different scales have been developed, assessing the self-reported extent of environmentalism and/or different aspects of how one claims to perceive the natural environment. Often, those scales refer to the specific relationship or view one has concerning nature, e.g. assessing the distinctness of ecocentric attitudes, i.e. valuing nature for its own sake, versus anthropocentric attitudes, i.e. valuing nature for the benefits it provides for humans (Thompson & Barton, 1994).

Despite the tremendous amount of scales existing to measure environmental attitudes, there are only very few which have proven to meet quality standards of test theory, have found wide acceptance and therefore are commonly used. The by far most widespread and often used measure is probably the *New Ecological Paradigm Scale* (Dunlap, Van Liere, Mertig, & Jones, 2000; Hawcroft & Milfont, 2010), it measures an individual's endorsement of an ecological worldview; compared to other related scales, one of its advantages is that it consists of 15 items that address general environmental topics that don't become dated (Dunlap et al., 2000; Hawcroft & Milfont, 2010).

Regarding measures that are up to date and have been examined for good reliability and validity, for the German language area there also are the *Scales for Assessing Environmental Concern* (Schahn, Damian, Schurig, & Füchsle, 2000) which have a broad scope and take into account individual environmental attitudes, behavioral intentions and

self-reported behavior; the instrument's 84 items furthermore correspond to seven different content related factor scales.

However, the most encompassing device for assessing environmental attitudes has been developed only recently. The *Environmental Attitudes Inventory* (Milfont & Duckitt, 2010) represents a valid and reliable, comprehensive self-description questionnaire that addresses the overall structure of environmental attitudes. Based on a thorough analysis of the existing literature, it conceptualizes a multidimensional and hierarchical model, confirmed by factor analysis (Milfont & Duckitt, 2004). Altogether it comprises 120 items and proposes 12 primary factors and either one general factor of higher order – *Generalized Environmental Attitudes* – or two opposed secondary factors, namely *Preservation* and *Utilization* of nature.

Table 1

The 12 first order factors of the Environmental Attitudes Inventory (Milfont & Duckitt, 2010)

1. Enjoyment of nature	***2. Support for interventionist conservation policies***
3. Environmental movement activism	***4. Conservation motivated by anthropocentric concern***
5. Confidence in science and technology	***6. Environmental fragility***
7. Altering nature	***8. Personal conservation behaviour***
9. Human dominance over nature	***10. Human utilization of nature***
11. Ecocentric concern	***12. Support for population growth policies***

1.6.2 Assessing environmental behavior

Comparable to when measuring environmental attitudes, the most common way to assess environmental behavior is to rely on self-report (Gatersleben, Steg, & Vlek, 2002). Basically that means implementing questionnaires or interviews in which respondents are asked how frequently or regularly they engage in certain everyday pro-environmental activities, respectively how often they have behavioral intentions to act in a nature conserving manner (for representative examples see: Leiserowitz et al., 2010; Saphores, Ogunseitan, & Shapiro, 2012). Intuitively it may seem as if measuring pro-environmental behavior should yield corresponding or very similar results to the reported environmental attitudes of a person, because behavior would largely be expected to be the product or manifestation of existing attitudes. However, this does not seem to be true, as has already been partly elaborated in chapter 1.3. Similarly, this discrepancy also becomes evident when self-reported behavior is concurrently compared to other-reported behavior. Experiments which include actually observing the behavior in question, e.g. re-use and recycling of different household materials, often display that if at all, there is only a low correlation between self-estimated behavior and the occurrence of those actions which are really performed (Chao & Lam, 2011; CorralVerdugo, 1997). This leads some researchers to the conclusion that beliefs are closely related to socially desirable norms, while observed competencies correspond to actual behavior more accurately (CorralVerdugo, 1997). This circumstance reflects the importance of distinguishing between reported and observed actions, and serves to remind that one should use caution interpreting the former.

Besides correlational studies seeking to find determinants of existing behavioral patterns or attitudes, there are also experimental approaches focusing on treatments, interventions, or manipulations which are supposed to encourage people to engage in pro-environmental behaviors (Osbaldiston & Schott, 2012). In their extensive review, Osbaldiston and Schott

(2012) categorize different forms of treatments aimed to improve pro-environmental behavior. They list four different main groups, containing ten different strategies (marked in italic print):

a) **Convenience** includes strategies *making it easy*, respectively changing situational conditions so that certain pro-environmental actions become more feasible and can be performed with less effort; and secondly, using *prompts*, i.e. brief reminders on when to perform specific actions.
b) **Information** refers to making available knowledge on why (*justification*: giving declarative reasons) or how (giving procedural *instructions*) to perform specific actions.
c) **Monitoring** involves *feedback* on personal behavioral patterns regarding specific environmentally relevant behaviors in the past, allowing participants to adjust accordingly. Furthermore, it includes rewards or incentives for showing certain behavior, respectively participating in an experiment.
d) **Social psychological processes** involve interactions between people and can refer to *social modeling*, in which persons, usually with an exemplary function, provide information about themselves engaging in specific pro-environmental behaviors. Another strategy would be to reduce *cognitive dissonance* by making people act in accordance to previously addressed beliefs or attitudes they have. Finally, asking participants to make a certain *commitment*, or having them *set* specific predetermined *goals* can be applied.

All these mentioned strategies can be and have been successfully implemented to increase pro-environmental behavior; the individual degree of each strategy's usefulness is hard to determine objectively, however, since certain treatments typically seem to be coupled with each other or with specific kinds of targeted behavior.

As for different categories of pro-environmental behavior, Osbaldiston and Schott (2012) furthermore list four different main categories, namely recycling, conserving energy, conserving water, and conserving gasoline. To examine ecological behavior, the vast majority of studies apply observing actual behavior in the field, for example recording the relative amount of paper being thrown into recycling bins in an office (Brothers, Krantz, & McClannahan, 1994), measuring the usage of an elevator as compared to taking the stairs (Houten, Nau, & Merrigan, 1981), or checking how many participants try out new, previously non-habitual behaviors, such as using a bus or buying organic food (Bamberg, 2002). While experiments situated in the field usually have the benefit of high ecological validity, they are normally also associated with increased expenditure and yield harder to interpret results. To our knowledge to date there is no large scale laboratory study that actually implements a valid measure of directly assessing pro-environmental behavior, specifically when applying group testing. Such a study, while being set completely in a laboratory, would have to induce a situation prompting participants to choose one of several different courses of action that represent varying degrees of pro-environmental behavior.

1.7 Outline of the research design and objectives

The main aim of this study is to determine whether inducing empathic concern can successfully be used to increase environmental attitudes and to trigger pro-environmental behavior. Furthermore, it is examined if interindividual differences in the extent to which someone discounts future rewards can account for a significant amount of interindividual variance in environmental attitudes or environmentally friendly behavior; people discounting future rewards less might be more prone to think and act ecologically.

The implemented study design is a randomized controlled trial with pre and post measurements in both groups. Inducing empathic concern is achieved by using a classic

approach of social psychology, following Batson et al. (2007). Participants are informed about people who suffer from the consequences of man-made environmental deterioration, and in the experimental group are instructed to take the perspective of those people, while in the control group they're told to remain as objective as possible. Participants' environmental attitudes are assessed using the Environmental Attitudes Inventory (EAI; Milfont & Duckitt, 2010), once before and once after they receive the above-mentioned information. The individual delay discounting parameter is assessed following the procedure established by Kirby, Petry, and Bickel (1999).

Additionally, this study tries to introduce an innovative and meaningful method for directly measuring pro-environmental behavior in the laboratory. As operationalisation of such behavior, subjects have to take a cup from one of two stacks of paper cups in front of them. Although not immediately and obviously noticeable, each stack contains only one certain sort of paper cups: the stack closer to the participants a conventional, non-recyclable cup, and the further away stack, requiring slightly more effort to reach out to, one more ecological friendly cup, made of bio-degradable material. Participants are instructed to take a paper cup – and thus to implicitly choose one of the two different variants – twice, once before and once after being informed about the people suffering from environmental deterioration. To provide a stronger and reasonable, yet not obvious, link to the paper cups, the reason for environmental deterioration in the specific example is stated to be high paper consumption (more details on this in section *2.2 procedure and material*).

2. Methods

The experiment was embedded in a large-scale study addressing the relationship of different genotypes to reward-processing and accompanying brain activation patterns. That main study included collecting a saliva sample from each subject. For this reason a relative

high amount of participants was recruited, who all received a monetary compensation. All tasks and interactions with participants were entirely carried out in German language.

2.1 Participants

Participants were recruited via postings on publicly accessible blackboards throughout Vienna, mostly at the University of Vienna. Furthermore, a notice was inserted on well known Austrian online job market platforms (www.unijobs.at, www.jobwohnen.at). Although irrelevant for the reported experiment in particular, participants all had to fulfill certain criteria of MR-scanning compatibility in order to participate. This included the following: 1) being right handed, 2) having no history of mental illnesses, respectively not taking any psychotropic drugs, 3) not being pregnant, 4) not having any metal parts in or on one's body that can't be removed, e.g. pieces of shrapnel or metallic implants, 6) not having an artificial pacemaker, 7) not being claustrophobic, and 8) not consuming illegal substances on a regular basis or within the last four weeks.

Altogether, 297 subjects participated, of which one person had to be excluded because it turned out that he had already participated before. There were 161 female (age ranging from 19 to 40, Median = 21) and 135 male subjects (age ranging from 19 to 40, Median = 24).

2.2 Procedure and material

The experiment took place at the group behavioral laboratory of the Faculty of Economic Psychology of the University of Vienna. Group testing was applied, with up to 15 subjects participating simultaneously. One testing session usually took 1,5 to 2 hours, with a short break of 15 minutes in between; each participant received a baseline monetary compensation of 15€. The assessments that are relevant for the present study all happened in the first 30 to 45 minutes, prior to the intermission.

Before attending the actual testing session at the university, participants received a link to a preceding online survey comprising several different questionnaires that mainly addressed different measures for impulsivity and/or mood regulation. Among the administered questionnaires also were the short version of the EAI (consisting of 72 balanced items, translated into German, see Appendix A1) and the "Saarbrücker Persönlichkeitsfragebogen", SPF (Paulus, 2009, see Appendix A2), which is the German version of the Interpersonal Reactivity Index, IRI, a frequently used questionnaire for measuring dispositional empathy, comprising four different scales that refer to underlying psychological domains: *Fantasy*, *Perspective-taking*, *Empathic Concern*, and *Personal Distress* (Davis, 1980, 1983). Completing the online survey took roughly 40 minutes altogether; successful completion was verified for each subject and acted as a prerequisite for participating in the actual experiment.

Upon arrival, participants were seated at their assigned places. Each participant had an own booth that was shielded from viewing with partitioning screens, so that participants couldn't interact with each other during the experiment. Each booth had a 20'' 4:3 PC monitor, keyboard and mouse. Additionally, a written informed consent sheet and a tubular saliva collection device had been placed on each table in front of the keyboard. To their right, participants found a carafe which was half-full with tap water, while on the left hand side of each table there were two stacks of different paper cups positioned approximately 15 centimeters behind each other. The front stack consisted of ordinary, non-recyclable paper cups, while the other stack, which was slightly further away from the participants, comprised similar looking, but more ecological friendly paper cups, made of bio-degradable material. At a close look, the two different kinds of cups were clearly distinguishable from each other, as the biodegradable ones had significantly less, respectively different coating, and a brown-green lettering saying "for ecological thinking

people - greenway®" (see figure 3 for image). Both stacks were equal in height and consisted of a sufficient amount of cups (15 conventional, 12 eco-friendly), so that taking away one wouldn't result in a noticeable difference.

Figure 3. Bio-degradable paper cup without plastic coating, used in the experiment

As soon as all expected participants were present and seated, the group was welcomed and instructions were given on how to proceed. Participants were told that in order to correctly provide their saliva sample, they first had to rinse out their mouth with water, for which they should pick one of the paper cups in front of them and pour water into it from the carafe. Afterwards, the given saliva samples, the used cups, and the signed informed consent sheet were collected; each participant's choice of cup was recorded. Participants then were told that they could now begin going through the actual tasks, presented on the computer screen.

The experiment was programmed and administered using the software E-Prime. First, a delay discounting task was conducted, consisting of 27 items, following Kirby et al. (1999). For each item, participants had to indicate if they'd prefer receiving a certain monetary reward now, or a different monetary amount at a certain time-point in the future (e.g. 19€ now or 25€ in 53 days; see table 2 for exact values). Participants had been informed that one of the 27 items would later be randomly chosen, and that they would receive 12% of the amount indicated on-screen, at the stated time via bank transfer (e.g. if

someone chose the option 25€ in 53 days, and that item was picked, then the participant would receive 3€ - which is 12% of 25€ - in 53 days). To avoid making the option of choosing the future amount artificially less attractive, all remunerations were paid by bank transfer, even the immediate ones.

Table 2

The 27 items of the implemented delay discounting task for calculating individual discount rates, following the procedure of Kirby et al. (1999).

Item	*now*	*later*	*Item*	*now*	*later*	*Item*	*now*	*later*
1	54€	55€/117d	**10**	40€	55€/62d	**19**	33€	80€/14d
2	55€	75€/61d	**11**	11€	30€/7d	**20**	28€	30€/179d
3	19€	25€/53d	**12**	67€	75€/119d	**21**	34€	50€/30d
4	31€	85€/7d	**13**	34€	35€/186d	**22**	25€	30€/80d
5	14€	25€/19d	**14**	27€	50€/21d	**23**	41€	75€/20d
6	47€	50€/160d	**15**	69€	85€/91d	**24**	54€	60€/111d
7	15€	35€/13d	**16**	49€	60€/89d	**25**	54€	80€/30d
8	25€	60€/14d	**17**	80€	85€/157d	**26**	22€	25€/136d
9	78€	80€/162d	**18**	24€	35€/29d	**27**	20€	55€/7d

Note. **For every item, subjects had to choose between a certain immediate amount or another amount received in a specified number of days.**

After completing the delay discounting task, participants were informed that they would be reading a news report from a well-known Austrian online news portal. The news text was adapted from an actual text found on the website of the Austrian Broadcasting Agency (www.ORF.at), which dealt with flooding in rural communities in Austria ("Orte in der Oststeiermark überflutet," 2009). This text was mainly chosen for two particular reasons: first, because the depicted events in it were believed to be comparatively relevant and

relatable for the participants, given the local contiguity; and second, because floods are a strong and comprehensible example of negative consequences resulting from human interference with delicate eco-systems. Furthermore, there has been evidence that first-hand experience of a flood can act as a strong motivation to act more environmentally friendly. Therefore, highlighting links between local weather events and climate change respectively man-made environmental deterioration, is likely to be a useful strategy for increasing environmental concern and action (Spence, Poortinga, Butler, & Pidgeon, 2011).

The original text found online was modified in suitably few aspects, so that the result would still resemble the actual news report as closely as possible. Advertisements from the original website were removed; names of villages, communities and districts were replaced with fictitious but authentic sounding ones. The text was carefully edited, the most vivid and dramatic depictions of flood consequences served as introduction. In the main part the story of a family which dramatically suffered from the flood was included. In direct and indirect speech it was stated that their house had been totally devastated by landslides resulting from the flood, and that the family's basis of existence had been ruined, as they had been producing and selling honey, but the beehives had all been demolished as well. In the text, the members of the family reported to be without prospects and without a place to sleep, as the landslide had occurred in the middle of the night and they had been forced to flee quickly, leaving all valuables behind. Additionally, readers were informed that the family's 6 year old boy had broken his ribs trying to escape from the landslide, which was why he had to be in the hospital for treatment. The final part of the text concluded by citing a (fictitious) study of the Institute of Meteorology of the University of Natural Resources and Life Sciences, Vienna. According to the study, rising levels of paper consumption led to a 5 to 10-fold increase of local floodings, mainly because there were fewer trees that

could absorb rainwater, thus fostering erosion and overflowing rivers, as well as global warming. It was explicated that often local inhabitants would suffer from these conditions. Furthermore, the text stated that, concerning paper and cardboard products, there were many recyclable alternatives available, which could help ameliorate the overall situation. (For the entire German text see Appendix A3.)

Participants had been randomly assigned to one of two different groups under which they should read the news report, either “imagine-perspective” or “objective-perspective” (for this procedure also see Batson et al., 2007). In the imagine-perspective group subjects were told that it would be their task to empathize with the people mentioned in the succeeding text, i.e. to try to imagine how those people were feeling and how the depicted events affected their lives. In the objective-perspective group subjects were instructed to try to take an objective perspective toward what was described. They were told to focus solely on the facts and to remember them, and not to get caught up in how the described people felt. Instead they were asked to remain objective and detached.

After the news report had been read, a new text screen appeared, presenting subjects a cover story so they would have to choose one of the paper cups again. It was claimed that one aim of the experiment was to determine the influence of different focuses of attention on someone’s ability in estimating. Therefore, participants were asked to pick one of the cups and try to fill it with water from the carafe, so that it would weigh exactly 75 grams. The choice of picked cup was noted, the filled cups were collected and weighed subsequently.

Next, participants completed the brief version of the EAI, consisting of 24 items (see Appendix A1), presented in a random succession. Although prior to coming to the laboratory they had filled out the short version (with 72 items), the brief version was

administered in order to avoid fatigue and boredom, and to prevent the testing session from going to long.

Finally, the "Batson Scale" was completed, comprising 20 different adjectives (Batson et al., 1987; also see Appendix A4); for each one participants had to indicate how accurately it described how they felt towards the mentioned people in the news report while reading it. This questionnaire is used to examine whether and to what extent people report to have experienced either empathic concern or personal distress – as there are 8 personal distress items, 6 empathic concern items, and 6 distractors. Experiencing empathic concern leads to a more altruistically motivated behavior/experience, while feeling personal distress leads to a more egoistically motivated one, although the observable outcome may be similar, regardless of the underlying emotion (Batson et al., 1987).

Additionally, two questions were administered, directly checking the perspective manipulation by enquiring how much the participants had imagined how the mentioned persons felt, respectively how objective they had stayed.

At the end of the experiment, participants filled out a debriefing questionnaire with 13 questions concerning the procedure of the experiment and what could be improved in their opinion (see Appendix A5). Most of these questions were distractor items. However, there were three questions dealing with the different sorts of cups, enquiring (1) if participants had noticed the difference between them, (2) if so, what they thought was the main difference, and (3) what the main reason was that led them to choose the cup they chose.

3. Results

3.1 Perspective manipulation

There were 136 subjects in the "imagine-perspective" group, and 140 in the "objective-perspective" group. (Of the original 296 participants, 20 had been presented another

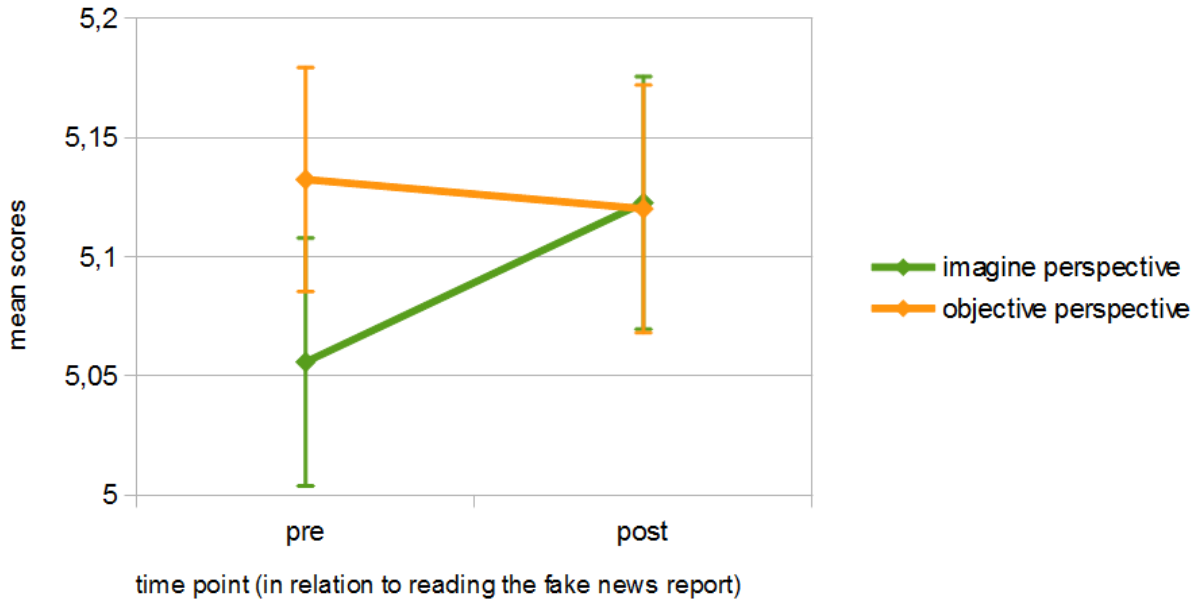
control text, which did not depict human suffering related to environmental deterioration; therefore those individuals have not been included in the present analysis.)

For the items of the Batson Scale, the mean value of those adjectives representing felt empathy was higher in the imagine-perspective group (M = 4.53) than in the objective-perspective group (M = 3.70); t(274) = -7.693, p < .001. Likewise, the personal distress items had a higher mean in the imagine-perspective group (M = 4.033) than in the objective perspective group (M = 2.883); t(263.911) = -6.277, p < .001. Subjects reported significantly higher degrees of perspective-taking in the imagine-perspective group, M = 5.26 vs. M = 3.76 for objective-perspective, t(238.865) = -9.937, p < .001, as well as higher degrees of staying objective in the objective-perspective, M = 5.24 vs. M = 4.01 for imagine-perspective, t(262,641) = 7.475, p < .001. Taken together, these results indicate that the intended experimental manipulation was effective in inducing higher levels of vicarious emotions in the perspective taking group.

3.2 Environmental attitudes

Observing levels of the EAI single primary factor, the "Generalized Environmental Attitudes" (GEA), there was neither a significant main effect for the different groups, F(1, 274) = .281, p = .597, nor for the different points in time, F(1, 274) = 2.18, p = .141. Yet, there was a significant interaction between the two main effects, F(1, 274) = 4.577, p = .033, partial η^2 = .016, indicating that those subjects who were told to empathize with the people in the news report, afterwards displayed significantly higher GEA levels than before having read the text, t(139) = -2.494, p = .0144 (for descriptive statistics see table 3**).**

Figure 4. Interaction plot for Generalized Environmental Attitudes and empathy induction



Note. **The depicted error bars represent the within subjects standard error of the mean (68% confidence interval).**

Table 3

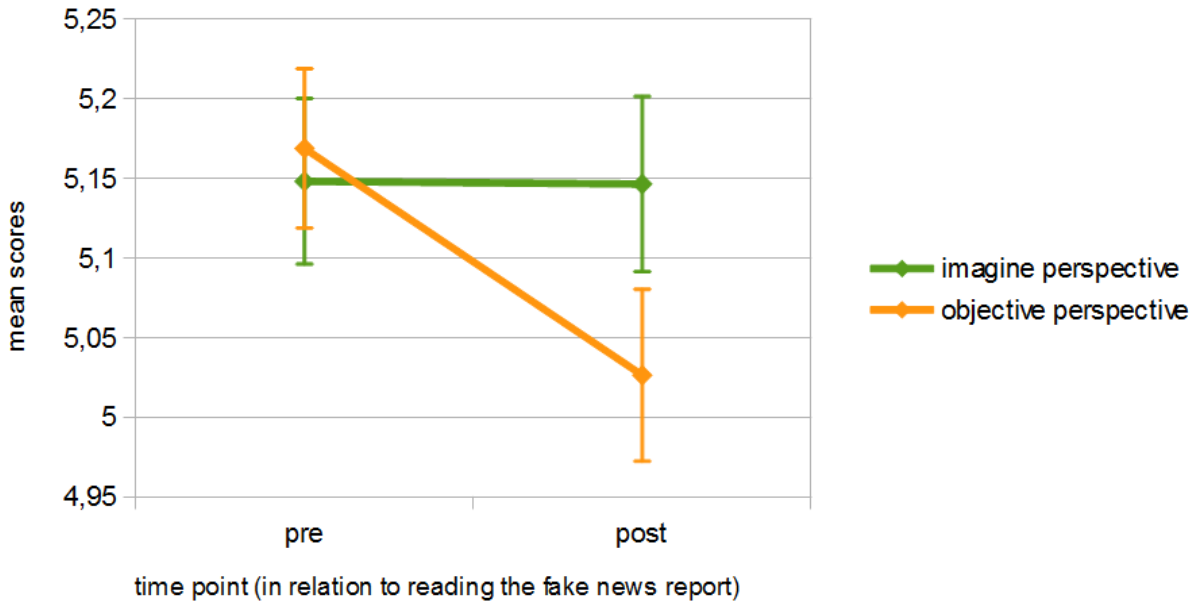
Descriptive statistics for GEA*Condition

	Condition	Mean	Std. Deviation	N
GEApre	objective	5,1324	,55347	136
	imagine other	5,0558	,61483	140
GEApost	objective	5,1201	,60570	136
	imagine other	5,1226	,62477	140

Regarding the EAI secondary factor "Preservation", which basically describes the tendency and willingness to preserve the natural environment, there was a significant main effect for the point in time, meaning that observed overall levels of Preservation were significantly lower after having read the news report, $F(1, 274) = 10.988$, $p = .001$, partial $\eta^2 = .039$. There were no overall significant differences between conditions, $F(1, 274) = .481$, $p = .488$. The significant main effect can be explained by an interaction effect of group with time, $F(1, 274) = 10.475$, $p = .001$, partial $\eta^2 = .037$, revealing that while no significant changes occur in the imagine-perspective condition, the Preservation levels

drop considerably in the objective-perspective condition, t(135) = 4.973, p < .001 (for descriptive statistics see table 4).

Figure 5. Interaction plot for Preservation and empathy induction



Note. **The depicted error bars represent the within subjects standard error of the mean (68% confidence interval).**

Table 4

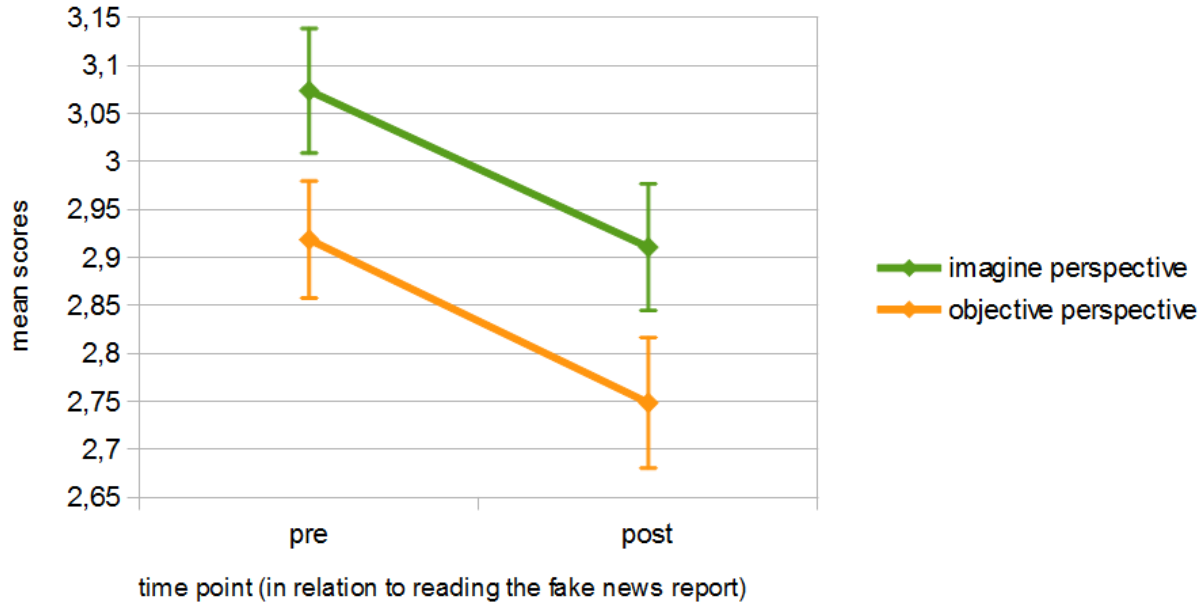
Descriptive statistics for Preservation*Condition

	Condition	Mean	Std. Deviation	N
PreservationPre	objective	5,1688	,58845	136
	imagine other	5,1481	,62041	140
PreservationPost	objective	5,0263	,63465	136
	imagine other	5,1464	,64501	140

For the other EAI secondary factor “Utilization”, which can be seen as an indicator of the extent to which someone reports to uncompromisingly use and instrumentalize natural surroundings and resources (with higher levels, therefore indicating less environmentally concerned behavior), a significant main effect was observed. Levels of Utilization dropped after having read the news report, regardless of the perspective taking condition, F(1, 274)

= 40.614, p < .001, partial η^2 = .129. Neither could a significant difference between conditions be found, F(1, 274) = 3.232, p = .073, nor a significant interaction effect, F(1, 274) = .019, p = .89.

Figure 6. Interaction plot for Utilization and empathy induction



Note. **The depicted error bars represent the within subjects standard error of the mean (68% confidence interval).**

Table 5

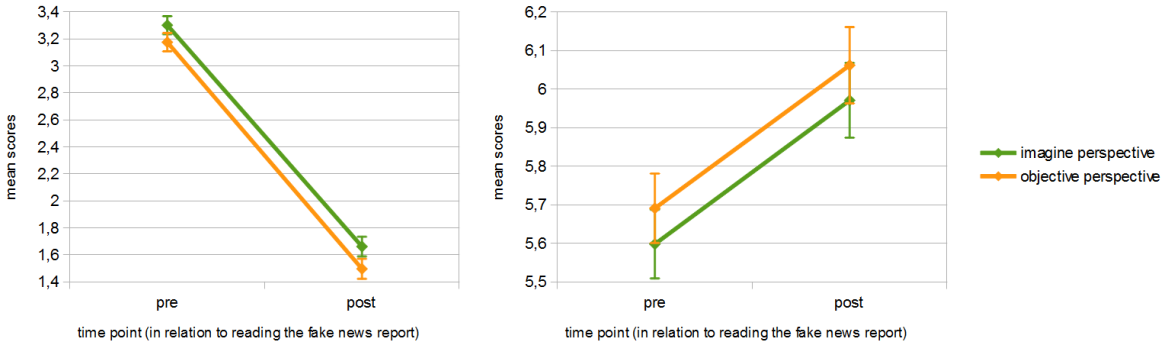
Descriptive statistics for Utilization*Condition

	Condition	Mean	Std. Deviation	N
UtilizationPre	objective	2,9186	,70665	136
	imagine other	3,0736	,76991	140
UtilizationPost	objective	2,7485	,79582	136
	imagine other	2,9107	,78003	140

Since the brief version of the EAI was administered in the post-test, determining changes in the 12 primary factor scores of the full version of the EAI would not lead to valid results. Because two of those scales, *Conservation motivated by anthropocentric concern* (AC), and *Environmental fragility* (EF), are conceptually of particular relevance for this study though, results regarding them are briefly presented as reference (for more detail see

section 4.1 *Breaking down the changes in environmental attitudes*). A significant main effect for changes in AC from pre- to post-test was observed, a decline from a mean score of 3.24 to 1.58, $F(1,274) = 910.824$, partial $\eta^2 = .769$, $p < .001$, with no significant between group differences, $F(1,274) = 3.028$, $p = .083$, and no interaction, $F(1,274) = 0.122$, $p = .727$. Conversely, EF levels significantly rose from a mean value of 5.64 before, to 6.02 afterwards, $F(1,274) = 39.646$, $p < .001$, partial $\eta^2 = .126$, also displaying neither relevant between group differences, $F(1,274) = .606$, $p = .437$, nor an interaction effect, $F(1,274) < .001$, $p = .983$.

Figure 7. Changes in EAI primary factor scales *Anthropocentric Concern* (left) and *Environmental Fragility* (right)



Note. **The depicted error bars represent the within subjects standard error of the mean (68% confidence interval).**

The degree of felt empathy, as recorded via Batson Scale, is moderately correlated with the increase of Generalized Environmental Attitudes (GEA) after completing the EAI for the second time, $r = .108$, one-sided $p = .036$. This holds true for felt personal distress and increase of GEA too, $r = .23$, one-sided $p < .001$. Similarly, increase in levels of EAI's secondary factor Preservation correlates with felt empathy, $r = .143$, one-sided $p = .009$, and with felt personal distress, $r = .216$, one-sided $p < .001$. Lastly, felt personal distress also is moderately negatively correlated with increases in the EAI secondary factor Utilization, $r = -.129$, one-sided $p = .016$. All computed correlations are Pearson correlations.

A multiple regression was modeled, with the changes in Generalized Environmental Attitudes as outcome variable, including the following potential predictor variables: 1) condition, 2) reported objectivity while reading the news article, 3) reported perspective taking while reading the news article, 4) felt personal distress via Batson Scale, 5) felt empathy via Batson Scale, 6) EAI subscale Anthropocentric Concern (pre), 7) IRI/SPF Perspective Taking, 8) IRI/SPF Fantasy, 9) IRI/SPF Personal Distress, and 10) IRI/SPF Empathic Concern. Variables were entered into the model using the stepwise backward method. As a result, the three predictors that remained were felt personal distress via Batson Scale, $\beta = .23$, $p < .001$, EAI subscale Anthropocentric Concern (pre), $\beta = .11$, $p = .057$, and IRI/SPF Empathic Concern, $\beta = -.11$, $p = .061$.

Repeating the multiple regression computation with the same predictor variables but this time with changes in EAI secondary factor "Preservation" as outcome variable, three significant predictors remain, which are: reported perspective taking while reading the news article, $\beta = .15$, $p = .033$; felt personal distress via Batson Scale, $\beta = .16$, $p = .021$; and IRI/SPF Empathic Concern, $\beta = -.12$, $p = .047$.

Finally, again including all the above mentioned predictor variables in a backward stepwise multiple regression computation for changes in the EAI secondary factor "Utilization" as outcome variable, only felt personal distress via Batson Scale, $\beta = -.11$, $p = .072$, and EAI subscale Anthropocentric Concern, $\beta = -.15$, $p = .016$, are kept in the model as predictors. For coefficients of all the mentioned multiple regression computations see the tables in Appendix B1.

3.3 Chosen cups

Of the 276 subjects, 10 had to be excluded for the analysis of chosen cups, because they either took more than one cup at a time, or failed to take at least two cups altogether. The

vast majority of the remaining subjects, namely 86.5%, chose the ordinary cup when they had to pick one the first time. McNemar-test reveals that a significant switch of cups occurred, i.e. a substantial amount of people tend to pick a different cup the second time, in comparison to the cup they chose first, $\varkappa^2 = 27.138$, $p < .001$. Revealingly, 23.5% of those subjects who initially chose the ordinary cup, switched to a different cup the second time, while 30.6% of those who had picked the ecological friendly cup at first, opted for the ordinary one the second time. However, the results are likely to be skewed because of major differences in the amount of people initially choosing different cups (230 choosing the ordinary cup vs. 36 choosing the biologically degradable one), therefore these numbers aren't necessarily conclusive.

Table 6

Number of cases for the different cup-choice combinations

chosen cup before	chosen cup after		relative switches
	ordinary cup	ecological cup	
ordinary cup	176 / 66.2%	54 / 20.3%	23.5%
ecological cup	11 / 4%	25 / 9.4%	30.6%

Note. **The relative switches column displays the percentage of switches for subjects who had initially picked the same cup sort.**

To check if the different conditions under which the news report was read (i.e. objective- and imagine-perspective) have an influence on the observed frequencies of environmentally concerned cup-switching, all those cases were excluded in which subjects had already chosen the ecologically friendly cup the first time. This was done because those subjects have no relevance for the hypothesis that inducing empathic concern helps to improve pro-environmental behavior, since they already chose the environmentally friendly option first, and thus cannot "improve" their choice. 230 subjects remained altogether, 114 in the objective-perspective group, 116 in the imagine-perspective group.

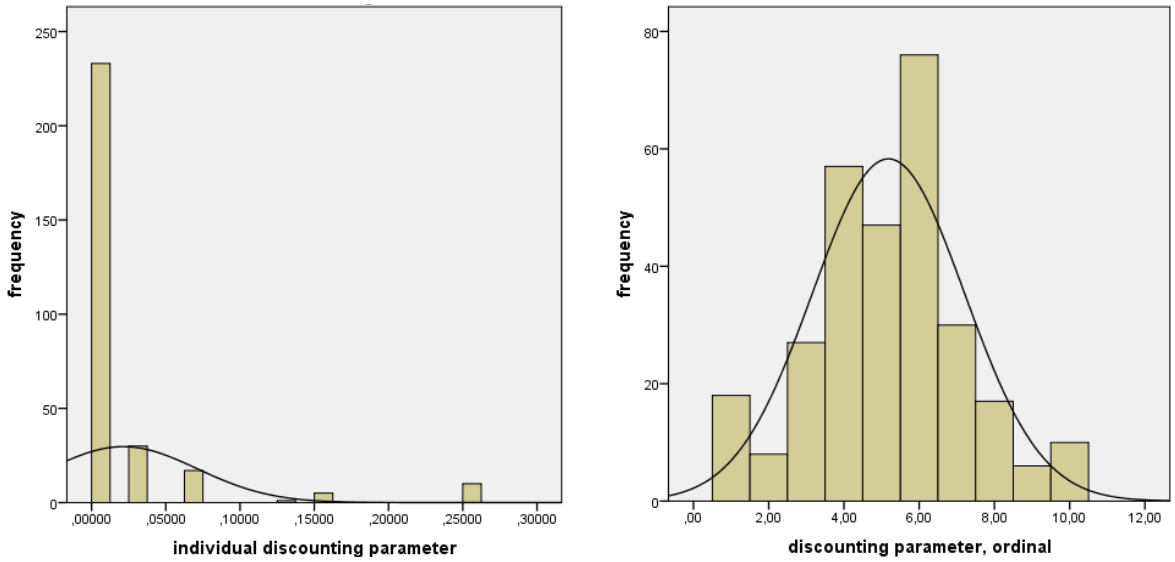
In the objective-perspective condition 21.1% (n = 24) of the subjects switched from the ordinary cup to the ecologically friendly one, in the imagine-perspective group this was the case for 25.9% (n = 30), exhibiting no significant difference between groups, $\varkappa^2 = .74$, p = .39.

An "environmentally concerned cup-switching" variable was computed, indicating whether a subject had switched from one sort of cup in the pre-test to another in the post-test, assigning a value of 0 when no switching occurred, 1 when someone first chose the ordinary cup and afterwards changed to the bio-degradable one, and -1 when someone who had chosen the bio-degradable cup earlier picked the ordinary one later on. This "switching" variable is slightly but significantly correlated with felt empathy, r = .102, one-sided p = .048, and felt personal distress, r = .11, one-sided p = .037, both as assessed via Batson Scale. Furthermore, the extent to which subjects report having stayed objective while reading the text is also mildly negatively correlated with cup-switching, r = -.154, one-sided p = .006. The above-mentioned method for computing cup-switching "penalizes" those cases in which the bio-degradable cup was chosen only in the pre-test (by assigning the value -1), and it doesn't differentiate between picking the ordinary or the bio-degradable cup twice. Both can be avoided by excluding those subjects that initially chose the bio-degradable cup, which results in slightly elevated significant correlations with cup-switching: r = .114, one-sided p = .043 for felt empathy via Batson Scale; r = .169, p = .005 for felt personal distress via Batson Scale; r = -.167, p = .006 for staying objective while reading; and additionally r = .122, p = .033 for the reported extent of perspective-taking while reading the text. However, cup-switching was not significantly related to any variables denoting higher order environmental attitudes or changes therein.

3.4 Individual discounting parameter

Individual discounting parameters were calculated for each subject, following the procedure described by Kirby et al. (1999). Because the resulting values were positively skewed in their distribution, they were transformed to ordinal values from 1 to 10, resulting in an acceptable normal distribution.

Figure 5. comparison of original values of discounting parameters (left) to ordinal transformed values (right)



The discounting parameter showed no significant relation to any variables denoting environmental attitudes or pro-environmental behavior. The only variable that the discounting parameter moderately was correlated with, was the factor “perspective taking” of the SPF/IRI, r = -.188, p = .001. The higher the individual discounting parameter is, the more a future reward loses in value with time to pass; so reporting to take different perspectives is moderately related to choosing the higher reward in spite of having to wait for it longer.

3.5 Debriefing questionnaire

All subjects except for two (n = 274) filled out the debriefing questionnaire that was administered after all other tasks had been completed. 67.5% of those subjects claimed to have noticed that there were different kinds of cups during the experiment, while the

remaining 32.5% had not been aware of any differences up till answering the debriefing question concerning this matter.

Interestingly, when asked for personal preference, 75.5% of the subjects stated to have liked the cup in the back with the writing on it, best. Only 8.8% of the subjects preferred the front, blank cups, while 15.7% liked both the same. Liking the cup in the back with the writing on it was mildly correlated with increases in the EAI higher order factor "Preservation", Pearson's $r = .14$, $p = .023$.

Regarding the perceived main difference between cups, 46% of the subjects thought it was the design, 31.8% the material, 5.5% the size, and 4.7% found it to be the shininess. As there additionally was the option to openly answer this question in one's own words, 59 subjects (21.5%) chose to do so. Of those, 33 people (12%) linked the main difference between cups to one sort being more environmentally friendly than the other. 10 individuals (3.6%) pinpointed the main difference as one sort of cup having a writing printed on it which the other kind of cups lacked. However, the writing was merely noticed to be there, but not attributed to signifying a more ecological cup. One participant even noted that in his opinion the cups with the writing were supposed to make the consumer feel more ecological friendly, but in truth only served the purpose of selling an equally bad product for a higher price. Five subjects (1.8%) saw the main difference between cups as related to the previous task of filling them with 75 grams of water; precisely this resulted in perceiving a different size, form, and/or filling mark, despite the fact that the cups had beforehand been carefully selected to match each other as closely as possible in mentioned aspects.

One question addressed the reason why subjects had chosen their specific cups. 55.1% of the subjects claimed to simply have picked the cups that were closer to them. 10.2% stated to have chosen the cups based on liking; 8.8% decided because of the material of the cups.

The rest stated to have picked the cups either because of convenience (1.8%), or because they were supposedly easier to fill (2.6%); 15 subjects (5.5%) indicated not knowing why they chose their cups. Again, for this question the option had been provided to openly answer it in one's own words as well, which 67 subjects (24.5%) did. The hereby given answers can be categorized analogously to those given for the above-mentioned previous question: 20 subjects (7.3%) specified reflections about environmental compatibility respectively environmentally friendly material as the main reason for choosing a cup. 7 subjects (2.6%) referred to the printing on the cups, without further elaborating this. 15 individuals (5.5%) attributed the main reason for choosing a cup to most easily being able to accomplish filling it with exactly 75 grams of water, due to perceived differences in size, form and/or filling mark. 9 subjects (3.3%) stated that balancing their choices was their main motivation for choosing a cup, i.e. it was important to them to take one cup of each sort, respectively each stack. Finally, 12 subjects (4.4%) claimed to either have just randomly chosen the cups or to regrettingly having noticed the difference between cups only after already having picked them, thus not choosing the cup they would have, had they noticed earlier.

A list containing all open answers provided for the last two above-mentioned questions can be found in Appendix B2.

4. Discussion

4.1 Breaking down the changes in environmental attitudes

The most apparent, clearly to be made observation from this study is that reading the fake news report which involved a depiction of people suffering from the consequences of man-made environmental deterioration did have a significant influence on the self-reported environmental attitudes. Seemingly most important, this was the case for the encompassing

higher order general factor of the EAI, the "Generalized Environmental Attitudes", GEA. Those subjects who had received instructions to imagine the perspectives of the suffering people mentioned in the fake news report, exhibited significantly higher overall levels of environmental attitudes afterwards. For subjects who had been instructed to stay as objective as possible while reading the text, the amount of GEA didn't change compared to the baseline. However, it has to be kept in mind that the observed changes in the experimental group after all only reflect a comparatively minor increase, representing a change on a 7-point scale from an average value of 5.06 before reading the news report, to an average of 5.12 afterwards. Not only is this a rather small effect (partial η^2 is .016) with before and after values representing the same point on a Likert scale, but the GEA levels of the participants in the "imagine other" group are also lower than those in the "objective perspective" control group to begin with, and merely rise to be nearly equal afterwards. Since the practical meaning of this small effect can be estimated to be marginal only, it is deemed necessary to further unravel the GEA into different factors, in order to shed light on the source of the observed slight overall increase.

Indeed, it is disputable whether a complex construct such as environmental attitudes can sufficiently be condensed into one single general factor, and in this light it is noteworthy that reading the fake news report did affect the two secondary higher order factors of the EAI as well and hereby also yielded partly higher effect sizes. This indirectly supports the notion that at least a model with two higher order factors is needed to accurately interpret results of the EAI (Milfont & Duckitt, 2004) and adequately describe environmental attitudes (Wiseman & Bogner, 2003). Of those two opposing factors, which taken together result in the GEA, the factor "Preservation" is described as expressing "the general belief that priority should be given to preserving nature and the diversity of natural species in its original natural state, and protecting it from human use and alteration" (Milfont & Duckitt,

2010, p. 81). Contrary to expectation, levels of Preservation did not rise in the "imagine other" group after reading the fake news report. Interestingly though, in the "objective perspective" group, levels of Preservation had decreased after reading the text, a partial η^2 of .037 displaying a small to medium effect size; this was not true in the "imagine other" group though, where the observed values of Preservation virtually stayed the same; seemingly, adopting the perspective of the suffering people mentioned in the text did result in higher levels of Preservation than in the objective control group, by preventing the self-reported values from declining.

For Utilization, the other second order factor, which in contrast to Preservation "expresses the general belief that it is right, appropriate and necessary for nature and all natural phenomena and species to be used and altered for human objectives" (Milfont & Duckitt, 2010, p. 81), the different groups played no important role. Although, surprisingly and falling just short of significance, the Utilization scores were continuously higher in the "imagine other" group, they dropped to the same extent in both groups when the EAI was administered the second time, thus maintaining the same mean difference between groups as before, only with lower overall scores. Despite the changes between pre- and post-administration not signifying different points on a 7-point scale (representing a value of 3), this denotes a large effect (with a partial η^2 of .129).

As the GEA scores are simply computed by adding up those of Preservation and (reversed) Utilization, changes in the latter two variables are actually more interesting to examine and give a slightly more detailed account of how the observed results might have come about. For both, Preservation and Utilization, there seems to be a tendency towards lower scores for the second completion of the EAI, mostly independent of the different groups. This is indicated by the fact that the Utilization levels in both conditions, as well as the Preservation levels for the subjects in the "objective perspective" group all had decreased

by the same amount, particularly around 0.16 points, solely the Preservation levels in the "imagine perspective" group remained virtually the same. For the drops in Utilization this seems plausible and attributable to a main effect of being confronted with the account of people who suffer from environmental deterioration. No matter whether instructed to be empathic or objective, the detailed portrayal of victims of ultimately man-made floods might have implicitly led to higher environmental awareness and thus to lesser extents of belief that utilizing the natural environment for human objectives is unproblematic and per se acceptable. However, this explanation fails to explain the same decline appearing for levels of Preservation in the "objective perspective" group, which would instead be expected to rise if subjects automatically experienced empathically motivated environmental awareness.

The items of the EAI are carefully selected, thoroughly examined to meet testpsychological criteria and are balanced, half of them are reversed coded; therefore aforementioned decreases being caused by confounding systematic response sets, such as a tendency to more unreflectingly agree respectively disagree with items, perhaps due to boredom, fatigue, disinterest or familiarity of items (Krosnick, 1991), is considered to be possible but unlikely. Even if this should be the case, it still can be concluded that the "imagine other" perspective did have an influence on participants, counteracting this artifact and preventing Preservation values from decreasing in the post-test.

To resolve the issue of how these results came about it might also be interesting in theory to look at every one of the 12 first order factors of the EAI and determine for how much of the total change occurring in the higher order factors each of them can account for. However, for the current experiment this approach would not be feasible or rather wouldn't lead to meaningful results. The reason for this being that – in contrast to the short version administered in the pre-test and consisting of 72 items – the brief version of the EAI,

which was administered in the post-test, contains only 24 items and therefore only allows to draw valid conclusions for higher order factors, but not for the 12 primary scales.

However, two of those 12 scales are in particular thematically closely related to the environmental issues mentioned in the news text: *Conservation motivated by anthropocentric concern* is defined by "support for conservation policies and protection of the environment motivated by anthropocentric concern for human welfare and gratification, versus support for such policies motivated by concern for nature and the environment as having value in themselves" (Milfont & Duckitt, 2010, p. 90). Though to a different extent and conceptually reversed, the role of environment for people's well-being is emphasized in items belonging to this factor, as has been done in the fake news text. While not entirely conclusive – for above-mentioned reasons – it is interesting to note that examining pre- and post-test unveils that the "Anthropocentric Concern" (AC) scores significantly and massively dropped for the second completion of the EAI, with no significant differences between groups. As all the AC items are "Utilization" items, this signifies more environmentally friendly attitudes afterwards, by greater refusal of somewhat superficial, short term gratifying reasons for environmental conservation (e.g. one of the items is "One of the most important reasons to keep lakes and rivers clean is so that people have a place to enjoy water sports"). It is noteworthy that while being thematically closely related, the directly addressed human well-being is conceptually reversed in the AC scale, dealing with direct human benefit from utilizing nature, in contrast to the fake news report which emphasizes human welfare as result of conserving nature; thus, the decrease of AC values appears logical.

The other specifically relevant scale, *Environmental fragility*, EF, is characterized as the "Belief that the environment is fragile and easily damaged by human activity, and that serious damage from human activity is occurring and could soon have catastrophic

consequences for both nature and humans, versus belief that nature and the environment are robust and not easily damaged in any irreparable manner, and that no damage from human activity that is serious or irreparable is occurring or is likely" (Milfont & Duckitt, 2010, p. 90). All items of the *Environmental fragility* scale are "Preservation" items. While in general, Preservation scores went down in the post-test (respectively stayed pretty much the same in the "imagine other" group), the EF scores had markedly increased for the second testing, displaying no significant difference between conditions.

Because computing scores for the primary factors based on the EAI brief version administered in the post-test is not likely to deliver valid results, the explanatory value of examining the AC and EF scores may rightly be questioned. However, though the corresponding items may not correctly reflect the actual scores on the respective factor scales, they do indicate environmental attitudes closely linked to those aspects addressed in the course of the experiment. Therefore, it is enlightening to see that, compared to more general environmental attitudes, the administration of the fake news text did have a relatively high effect on these items, and that this happened independently of the instruction participants received prior to reading it.

It should also be considered that 1) having to apply two different versions of the EAI, and 2) different testing conditions, i.e. pre-test online at home versus post-test within a group of other participants at the laboratory, naturally results in lower comparability between the first and second testing and could possibly be per se a source for confounded results in the changes of participants' scores.

Nevertheless, the results clearly display that reading the fake news text did have a moderate but significant effect on every one of the three higher order factors of Environmental Attitudes. For subjects who were in the empathy inducing condition, overall environmental attitudes had increased afterwards, while this was not, or only partly

the case for those subjects who were supposed to remain objective. The moderate effect sizes are likely to at least partly have occurred due to the fact that the targeted specific facets of pro-environmental attitudes/behavior – namely local floodings linked to the usage of (non-)recyclable paper products – did not generalize to broader, multi-faceted overall environmental attitudes.

The fact that in both groups the "Utilization" scores increased uniformly, as well as the scores of those items conceptually related to the aspects of human-environment interaction addressed during the experiment, suggests that the cause/motivation for increased environmental attitudes was equally present in both conditions and closely linked to the provided news text. As mentioned above, participants apparently were affected by reading about suffering people, regardless whether they explicitly tried to empathize with them or tried to avoid feeling empathically. This interpretation is backed by previous research findings leading to the conclusion that emotionally intense reports can automatically elicit empathy, even if accompanied by instructions emphasizing detachment and objectivity (Rumble, Van Lange, & Parks, 2010; Van Lange, 2008).

It also catches one's eye that in contrast to the degree of felt empathy, the personal distress which subjects experienced acted as the only consistently significant predictor of changes for every one of the EAI higher order factors. For changes in those factors the correlations with felt personal distress were nearly twice as strong as those with felt empathy. This indicates that altruistic empathic feelings might not have been the primary motivation for developing more environmentally friendly attitudes. After all, being affected by a regional flooding is a possibility that is likely to be at least remotely relevant for many participants, thus perhaps causing direct concern for one's own welfare.

While the multiple regression computations did also reveal other predictors for the EAI higher order factors, none of them were as straightforward and consistent for the three

different factors as the experienced personal distress. To correctly make sense of the other predictors it, again, would likely be necessary to examine their relation to the 12 EAI primary factors. Also, since the SPF/IRI scale "Personal Distress", which addresses the general tendency to feel distress, didn't exhibit any significant relation to observed values of EAI scales or changes therein, it can be assumed that the experienced personal distress as measured via Batson Scale is specific to the situation – respectively the text participants read – and cannot accurately be ascribed to the more general SPF/IRI personality trait with the same name.

Conducting a study which also operationalized pro-environmental behavior in the laboratory, Evans et al. (2012) found that compared to altruistic motivation, inducing egoistic motivation for acting environmentally friendly reduces the spillover to different areas of pro-environmental behavior, other than the one targeted. While it is clear that in the present research self-transcending reasons for pro-environmental attitudes and behavior have been made salient, it remains a non neglectable possibility that concern for one's own welfare may have also occurred and thus to a certain extent conflicted with extending altruistic pro-environmental attitudes to other, not immediately related areas respectively items of the EAI.

4.2 Interpretation of the cup-task results and the discounting rates

Roughly a quarter of the participants chose a different cup the second time, regardless of what cup they had picked the first time. Preliminary follow-up experiments (not yet published) with participants reading different control texts, appear to further replicate the observed pattern in cup switches. Therefore, this seems to be a natural tendency of varying/balancing one's choice, based on the equality decision making heuristic. For a review of this heuristic typically set in a social context, see Messick (1993); More broadly, Gigerenzer and Gaissmaier (2011, p. 470) define this process as allocating resources

equally to each of N alternatives. Yet, only relatively few participants stated this to be their motivation for choosing a cup. In fact, inferring from the debriefing questionnaire, the most common reason for switching cups was because of choosing the more environmentally friendly one, followed by picking the cup subjectively best suited for accomplishing the water-filling task.

However, even though two thirds of the participants claimed to have noticed the difference between cups during the experiment, this might not be a conclusive number, as the question was asked retrospectively, was somewhat subjective by indirectly informing subjects that there was a relevant difference between cups which could/should have been noticed, and finally tells little about at what point during the testing session the difference actually was noticed, i.e. before or after having to choose a cup.

In theory, reading the fake news text was supposed to raise participants' (environmental) awareness and thus lead to choosing the more ecologically sustainable cup, yet the implementation of the environmentally friendly option likely was too subtle, so that a large portion of participants didn't become aware of it, respectively did so only after already having completed the cup-choosing task. The problem is that choosing the ecologically sustainable cup required not only an increased positive attitude towards acting pro-environmentally, but also high attentiveness on how to do so. At least the latter aspect was complicated by the attention focusing (cover)task of filling a cup with 75 grams of water as precisely as possible. Still, switching from the ordinary to the bio-degradable cup was significantly related to having felt empathy or personal distress while reading the news text; albeit the corresponding correlations are small, this can be viewed as indication that accounts of people suffering from anthropogenic environmental deterioration do have the basic potential to be used as a means for increasing pro-environmental behavior.

Finally, personal discounting rates clearly were not related to pro-environmental attitudes or behavior. The future-oriented way of thinking relevant for pro-environmental behavior is more likely part of a complex and multi-faceted, holistic set of personality forming value orientations (Gärling, Fujii, Gärling, & Jakobsson, 2003; McConochie, 2011) that qualitatively differs from simple mathematical tradeoff consideration typically used to approach tasks involving temporal discounting (Scholten & Read, 2010). The observed slight correlation of the individual discounting parameter with the IRI/SPF scale "perspective taking" can be possibly explained by both variables being in part based on a more reflective thought style, taking into account either different perspectives of different people or different perspectives of oneself at different points in the future.

4.3 Conclusion and outlook

Concluding, this study provides evidence that inducing empathic concern by depicting humans suffering from anthropogenic environmental deterioration can indeed be applied to raise awareness for the cause and thus increase pro-environmental attitudes. However, this effect seems to actually be more strongly mediated by personal distress than by altruistic empathy, and it furthermore seems to be limited to the specifically targeted environmentally relevant aspect and doesn't easily generalize to more broadly defined, global environmental attitudes. To further confirm and reproduce the found effect, it would be interesting for future studies either to incorporate texts which jointly address more than one different environmentally relevant aspect, or administer different texts in different experimental groups, each including one distinct topic referring to one specific facet of pro-environmental attitudes.

The impact of induced empathic concern / distress on exhibiting actual pro-environmental behavior couldn't be verified, nor could it conclusively be dismissed. Regarding the present study design, in order to further clarify the matter it might prove helpful to

implement a control group in which participants read either a text describing environmental deterioration but not involving suffering humans, or a completely neutral text. If under those conditions cup switching occurred significantly less often, this could be regarded as evidence supporting the notion that the results of the current study can be explained by empathic concern / distress leading to higher cause-related environmental awareness, i.e. noticing the different cups, and behavior, i.e. switching to the more environmentally friendly one. Furthermore, as this study introduced a promising and insightful large scale laboratory approach to examine the relation between empathy and pro-environmental attitudes and behavior, it will be the task of future research in this vein to further refine the devised methods and come up with a still non-obtrusive but slightly less subtle operationalisation for pro-environmental behavior, enabling more participants to become aware of their different possible options of setting an ecologically relevant action.

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Appendices

A1 Environmental Attitudes Inventory, EAI (Milfont & Duckitt, 2010)

Short version (translated into German)

Instructions: Der folgende Fragebogen enthält eine Reihe von Aussagen zum Thema Natur und Umwelt. Geben Sie bitte für jede Aussage an, wie sehr Sie dieser zustimmen bzw. diese ablehnen.

Antworten erfolgen jeweils auf einer 7-stufigen Likert Skala, von „starke Ablehnung“ bis „starke Zustimmung“.

Enjoyment of nature

01. Ich mag es, Ausflüge in ländliche Gegenden zu unternehmen, zum Beispiel zu Wäldern oder Wiesen.
02. Ich finde es ziemlich langweilig, mich in Gegenden unberührter Wildnis zu befinden.
03. Draußen in der Natur zu sein, ist für mich eine großartige Methode, Stress abzubauen.
04. Ich empfinde tiefes Wohlergehen in der Stille der Natur.
05. Ich finde es in einem Einkaufszentrum interessanter als draußen im Wald zu sein und Bäume und Vögel zu betrachten.
06. Ich finde es langweilig, Zeit in der Natur zu verbringen.

Support for interventionist conservation policies

01. Regierungen sollten das Ausmaß in dem Rohstoffe verbraucht werden, überwachen, um sicherzustellen, dass diese so lange wie möglich erhalten bleiben.
02. Der Industrie sollten Einschränkungen auferlegt werden um die Umwelt vor Verschmutzung zu schützen, auch wenn das heißt, dass dadurch Dinge teurer werden.
03. Die Menschen in den Industrieländern werden in Zukunft werden in Zukunft auf einen nachhaltigeren Lebensstil umsteigen müssen.
04. Ich glaube nicht, dass die Menschen in den Industrieländern in Zukunft auf einen nachhaltigeren Lebensstil umsteigen müssen.
05. Es sollte der Industrie erlaubt werden, Rohmaterialien anstatt von recyceltem Material zu verwenden, wenn dies zu geringeren Preisen und Kosten führt, auch wenn dies bedeutet, dass letztendlich die Rohstoffe aufgebraucht werden.
06. Ich lehne es ab, dass Regierungen die Nutzung und den Verbrauch von Rohstoffen überwachen und reglementieren, um damit den Erhalt dieser zu sichern versuchen.

Environmental movement activism

01. Ich würde gerne einer Umweltschutz Gruppe beitreten und aktiv mitwirken.
02. Ich glaube nicht, dass ich einer Umweltschutz Organisation helfen würde, Spenden zu sammeln.
03. Ich würde mich NICHT an einer Umweltschutz Organisation beteiligen.
04. Umweltschutz ist eine kostspielige Angelegenheit. Daher wäre ich bereit, mich an einer Spendensammelaktion zu beteiligen.
05. Ich würde kein Geld spenden wollen , um ein mit Umweltschutz in Verbindung stehendes Ziel zu unterstützen.
06. Ich würde gerne eine Umweltschutz Organisation unterstützen.

Conservation motivated by anthropocentric concern

01. Einer der wichtigsten Gründe, Seen und Flüsse sauber zu halten, ist, um es Menschen zu ermöglichen, Wassersport ausführen zu können.
02. Die Umwelt ist wichtig, weil sie vieles zur Freude und zum Wohlergehen der Menschen beitragen kann.
03. Der Umstand, der mich an der Abholzung von Wäldern am meisten stört, ist, dass es für zukünftige Generationen nicht genügend Nutzholz geben wird.
04. Naturschutz ist wichtig, selbst wenn die Menschen deswegen ihren Lebensstandard anpassen müssen.
05. Es ist unsere Pflicht, Seen und Flüsse rein zu halten, um die Umwelt zu schützen, und NICHT um den Menschen Orte zu geben , an denen sie Wassersport betreiben können.
06. Es ist unsere Pflicht, die Umwelt zu schützen, selbst wenn darunter das Wohlergehen der Menschen leidet.

Confidence in science and technology

01. Wissenschaft und Technologie werden es letztlich vermögen, unsere Probleme der Umweltverschmutzung, Überbevölkerung und abnehmender Ressourcen zu lösen.
02. Die moderne Wissenschaft wird NICHT in der Lage sein, unsere Umweltprobleme zu lösen.
03. Wir können uns nicht mehr weiterhin darauf verlassen, dass die Wissenschaft und Technologie unsere Umweltprobleme lösen wird.
04. Letztlich werden die Menschen lernen, alle Umweltproblematiken zu lösen.
05. Der Glaube daran, dass Fortschritt in Wissenschaft und Technologie zu einer Lösung unserer Umweltprobleme führt, ist völlig falsch und irreführend.
06. Die moderne Wissenschaft wird unsere Umweltprobleme lösen.

Environmental fragility

01. Wenn Dinge weiter so laufen wie bisher, dann wird uns bald eine verheerende ökologische Katastrophe widerfahren.
02. Wenn Menschen sich in die Natur einmischen, hat dies oft Konsequenzen mit katastrophalem Ausmaß

03. Die Menschen nutzen die Umwelt massivst aus.
04. Die Vorstellung, dass das Gleichgewicht der Natur unheimlich störungsanfällig und leicht durcheinanderzubringen ist, ist viel zu pessimistisch.
05. Ich glaube nicht, dass die Umwelt von den Menschen massivst ausgenutzt wurde.
06. Leute, die behaupten, die unnachgiebige Ausbeutung der Natur habe uns an den Rand des ökologischen Zusammenbruchs gebracht, liegen falsch.

Altering nature

01. Ich würde einen wilden und naturbelassenen Garten einem gut gepflegten und ordentlichen gegenüber bevorzugen.
02. Menschen sollten nicht in die Natur eingreifen, selbst wenn diese für uns unangenehm und ungemütlich ist.
03. Die Erschließung von neuem, noch ungenutzten Landflächen für Ackerbau und agrarwirtschaftlichen Nutzung sollte unterbunden werden.
04. Ich würde einen gut gepflegten und ordentlichen Garten einem wilden und naturbelassenen gegenüber sehr bevorzugen.
05. Wenn die Natur für Menschen unangenehm und ungemütlich ist, haben wir jedes Recht, sie zu ändern und unseren Bedürfnissen anzupassen.
06. Zwischen Pflastersteinen wachsende Gräser und Unkraut sehen wirklich unordentlich aus.

Personal conservation behaviour

01. Ich hätte keine Lust, an Wasser oder anderen natürlichen Ressourcen zu sparen.
02. Im Alltag bin ich einfach nicht daran interessiert, sparsam mit Wasser oder Strom umzugehen.
03. Ich schalte immer das Licht aus, wenn ich es nicht mehr brauche.
04. Ich versuche im Alltag Wege zu finden, um möglichst sparsam mit Wasser oder Strom umzugehen.
05. Ich bin NICHT jemand, der sich bemüht, sparsam mit natürlichen Ressourcen zu bewahren.
06. Wann immer möglich, versuche ich mit natürlichen Ressourcen sparsam umzugehen.

Human dominance over nature

01. Menschen sind dazu bestimmt, über den Rest der Natur zu herrschen.
02. Menschen wurden dazu erschaffen oder haben sich dazu entwickelt, die übrige Natur zu beherrschen.
03. Pflanzen und Tiere haben das gleiche Recht zu existieren wie Menschen.
04. Pflanzen und Tiere existieren hauptsächlich, um von den Menschen benutzt zu werden.
05. Ich glaube NICHT daran, dass Menschen dazu erschaffen wurden oder sich dazu entwickelt haben, um die übrige Natur zu beherrschen.
06. Menschen sind nicht wichtiger als irgendeine andere Spezies.

Human utilization of nature

01. Es ist wichtiger, Arbeitsplätze zu erhalten, als die Umwelt zu schützen.
02. Menschen haben NICHT das Recht dazu, die Umwelt zu schädigen, nur um das wirtschaftliche Wachstum voranzutreiben
03. Es ist wichtiger, die Umwelt zu schützen als das wirtschaftliche Wachstum.
04. Es ist wichtiger, die Umwelt zu schützen als Arbeitsplätze zu erhalten.
05. Die Umweltfrage ist im Vergleich zum wirtschaftlichen Wachstum zweitrangig.
06. Der Nutzen moderner Konsumgüter ist bedeutsamer als die Umweltverschmutzung, die durch ihre Produktion und Verwendung entsteht.

Ecocentric concern

01. Die Vorstellung, dass die Natur um ihrer selbst willen wertvoll ist, ist naiv und falsch.
02. Die Natur ist um ihrer selbst willen wertvoll.
03. Ich denke nicht, dass der Umweltschutz ein wichtiges Thema ist.
04. Trotz unserer besonderen Fähigkeiten unterliegen wir Menschen immer noch den Gesetzen der Natur.
05. Es macht mich traurig mit anzusehen, wie Wälder für die Landwirtschaft gerodet werden.
06. Es macht mich NICHT traurig zu sehen, wie die natürliche Umgebung zerstört wird.

Support for population growth policies

01. Familien sollten dazu angehalten werden, maximal zwei Kinder zu bekommen.
02. Ein verheiratetes Paar sollte so viele Kinder bekommen dürfen wie es möchte, solange es diese angemessen versorgen kann.
03. Unsere Regierung sollte die Menschen darüber aufklären, wie wichtig es ist, höchstens ein oder zwei Kinder zu haben.
04. Wir sollten die Kinderzahl, die ein Paar haben darf, niemals begrenzen.
05. Wir wären besser dran, wenn wir die Anzahl der Menschen auf der Erde drastisch reduzieren würden.
06. Die Regierung hat kein Recht dazu, verheirateten Paaren vorzuschreiben, wie viele Kinder sie haben dürfen.

Brief version (translated into German)

Instructions: Im Folgenden lesen Sie eine Reihe von Aussagen zum Thema Natur und Umwelt. Geben Sie bitte dafür zu jeder Aussage auf einer siebenstufigen, kontinuierlichen Skala an, wie sehr Sie der Aussage zustimmen bzw. sie ablehnen.

Verwenden Sie hierfür bitte die Tasten 1 bis 7 auf der Tastatur, dabei steht 1 für starke Ablehnung und 7 für starke Zustimmung.

Das heißt, je höher die Zahl, desto stärker die Zustimmung.

Enjoyment of nature

01. Ich mag es, Ausflüge in ländliche Gegenden zu unternehmen, zum Beispiel zu Wäldern oder Wiesen.
02. Ich finde es langweilig, Zeit in der Natur zu verbringen.

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01. Regierungen sollten das Ausmaß in dem Rohstoffe verbraucht werden, überwachen, um sicherzustellen, dass diese so lange wie möglich erhalten bleiben.
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02. Es ist unsere Pflicht, Seen und Flüsse rein zu halten, um die Umwelt zu schützen, und NICHT um den Menschen Orte zu geben, an denen sie Wassersport betreiben können.

Confidence in science and technology

01. Die moderne Wissenschaft wird NICHT in der Lage sein, unsere Umweltprobleme zu lösen.
02. Die moderne Wissenschaft wird unsere Umweltprobleme lösen.

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Altering nature

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02. Ich würde einen gut gepflegten und ordentlichen Garten einem wilden und naturbelassenen gegenüber sehr bevorzugen.

Personal conservation behavior

01. Ich bin NICHT jemand, der sich bemüht, sparsam mit natürlichen Ressourcen zu umzugehen.
02. Wann immer möglich, versuche ich mit natürlichen Ressourcen sparsam umzugehen.

Human dominance over nature

01. Menschen wurden dazu erschaffen oder haben sich dazu entwickelt, die übrige Natur zu beherrschen.
02. Ich glaube NICHT daran, dass Menschen dazu erschaffen wurden oder sich dazu entwickelt haben, um die übrige Natur zu beherrschen.

Human utilization of nature

01. Es ist wichtiger, Arbeitsplätze zu erhalten, als die Umwelt zu schützen.
02. Es ist wichtiger, die Umwelt zu schützen als Arbeitsplätze zu erhalten.

Ecocentric concern

01. Es macht mich traurig mit anzusehen, wie Wälder für die Landwirtschaft gerodet werden.
02. Es macht mich NICHT traurig zu sehen, wie die natürliche Umgebung zerstört wird.

Support for population growth policies

01. Familien sollten dazu angehalten werden, maximal zwei Kinder zu bekommen.
02. Ein verheiratetes Paar sollte so viele Kinder bekommen dürfen wie es möchte, solange es diese angemessen versorgen kann.

A2 Saarbrücker Persönlichkeitsfragebogen (Paulus, 2009)

Instructions: Die folgenden Aussagen beziehen sich auf Ihre Gedanken und Gefühle in verschiedenen Situationen. Bitte lesen Sie sich jede Aussage sorgfältig durch und geben Sie dann durch Ankreuzen der entsprechenden Zahl an, wie gut die Aussage Sie beschreibt.

BITTE LESEN SIE JEDE AUSSAGE GENAU DURCH BEVOR SIE ANTWORTEN.

Antworten Sie dann so ehrlich und genau wie möglich. Vielen Dank.

Antworten erfolgen jeweils auf einer 5-stufigen Skala, von „beschreibt mich nicht gut“ bis „beschreibt mich sehr gut“.

1) Ich habe öfters Tagträume und Fantasien über Dinge, die mir passieren könnten.
2) Ich empfinde oft warmherzige Gefühle für Leute, denen es weniger gut geht als mir.
3) Ich finde es manchmal schwierig, die Dinge vom Standpunkt eines anderen Menschen aus zu sehen.
4) Manchmal habe ich nicht viel Mitleid mit Leuten, die Probleme haben.
5) Die Gefühle einer Person in einem Roman kann ich mir oft sehr gut vorstellen.
6) In Notfallsituationen fühle ich mich ängstlich und unbehaglich.
7) Gewöhnlich bleibe ich sachlich, wenn ich einen Film oder ein Theaterstück sehe, und ich werde selten von der Handlung mitgerissen.
8) Ich versuche, bei einem Streit zuerst beide Seiten zu verstehen, bevor ich eine Entscheidung treffe.
9) Wenn ich sehe, dass jemand ausgenutzt wird, glaube ich, ihn schützen zu müssen.
10) Manchmal fühle ich mich hilflos, wenn ich inmitten einer sehr emotionsgeladenen Situation stecke.
11) Ich versuche manchmal, meine Freunde besser zu verstehen, indem ich mir vorstelle, wie die Dinge aus deren Sicht aussehen könnten.
12) Es kommt relativ selten vor, dass ich von einem Buch oder einem Film so richtig mitgerissen werde.
13) Wenn ich sehe, wie jemand verletzt wird, bleibe ich eher ruhig.
14) Gewöhnlich beunruhigt mich das Unglück anderer Leute nicht sehr.
15) Wenn ich überzeugt bin, dass ich Recht habe, verschwende ich nicht viel Zeit damit, die Argumente anderer Leute anzuhören.
16) Nachdem ich einen Film gesehen habe, fühle ich mich manchmal so, als ob ich eine der Personen aus diesem Film wäre.
17) Es macht mir Angst, in angespannten emotionalen Situationen zu sein.
18) Wenn ich sehe, dass jemand ungerecht behandelt wird, habe ich manchmal nicht sehr viel Mitleid mit ihm.
19) Ich kann normalerweise ziemlich kompetent mit Notsituationen umgehen.
20) Oft berühren mich Dinge sehr, die ich nur beobachte.
21) Ich glaube, jedes Problem hat zwei Seiten, und versuche daher, beide zu betrachten.
22) Ich würde mich selbst als eine ziemlich weichherzige Person beschreiben.
23) Wenn ich einen guten Film sehe, kann ich mich sehr leicht in die Hauptperson hinein versetzen.
24) Ich neige dazu, in Notsituationen die Kontrolle über mich zu verlieren.
25) Wenn ich böse auf jemanden bin, versuche ich normalerweise, mich für eine Weile in seine Situation zu versetzen.
26) Wenn ich eine interessante Geschichte oder ein gutes Buch lese, versuche ich mir vorzustellen, wie ich mich fühlen würde, wenn mir die Ereignisse in der Geschichte passieren würden.

27) Wenn ich jemanden sehen würde, der in einer Notsituation dringend Hilfe benötigt, würde ich bestimmt zusammenbrechen.
28) Bevor ich jemanden kritisiere, versuche ich mir vorzustellen, wie ich mich fühlen würde, wenn ich an seiner/ihrer Stelle wäre.

A3 Fake news report (3 pictures, each presented as a new screen)

Das Wasser kommt mit solcher Gewalt daher, die Bewohner sind fast machtlos.

Schicksalsschläge

Besonders betroffen ist Familie Fischer. "Urplötzlich brachen nachts die Wassermassen und Schlammlawinen über unser Haus herein!" erzählt Dorothea Fischer, Hausfrau und Mutter von drei Kindern. "Es war schrecklich: wir hatten kaum Zeit, das Gebäude zu verlassen. Mitnehmen oder retten konnten wir nichts!" Die Stimmung ist gedrückt, als die Familie am nächsten Tag zwecks Schadensbegutachtung zum Ort ihres einstigen Heims zurückkehrt. Das an einem Hang gelegene Einfamilienhaus, welches von seinen Bewohnern erst kürzlich liebevoll renoviert wurde, ist nun völlig verwüstet und muss wahrscheinlich abgerissen werden, da es durch den massiven Erdrutsch am Vortag einzustürzen droht.

Den Tränen nahe berichtet der gelernte Imker Konrad Fischer: "Ich weiß wirklich nicht, was wir jetzt tun sollen. Alle Bienenstöcke, die am Hang standen, sind demoliert. Der Honig, den wir von zu Hause aus verkauft haben - alles ist weg. Unsere Existenzgrundlage ist zerstört." Nicht genug, liegt das jüngste Familienmitglied, der 6-jährige Stefan, mit einem Rippenbruch im örtlichen Krankenhaus, weil er bei der übereilten, nächtlichen Flucht die Treppe hinunterstürzte. In ihrer aussichtslosen Situation fehlt der Familie jegliche Perspektive: "Es ist so furchtbar", so die verzweifelte Frau Fischer, "ich kann es immer noch nicht ganz begreifen: nicht einmal einen Ort zum Schlafen haben wir jetzt noch!"

Umweltschutz ist Menschenschutz - Die bewusste Wahl macht einen Unterschied.

Papierkonsum mitschuld

Nach einer aktuellen Studie des meteorologischen Instituts der Wiener Universität für Bodenkultur ereignen sich heute weltweit 5 - 10 mal so viele Überschwemmungen und Flutunglücke wie noch vor 50 Jahren. Schuld daran ist vor allem der hohe und steigende Papierkonsum. Trotz häufig verfügbarer und besser recyclebarer Alternativen werden, um Papier- und Pappartikel herzustellen, unzählige Bäume gefällt - auch in Österreich. Durch den dezimierten Forstbestand kann vielerorts der Boden weniger Feuchtigkeit aufnehmen, es kommt häufiger zu Erosionen, das Wasser sickert schneller in Bäche und Flüsse, die in der Folge leichter überlaufen. Zudem kann durch die sinkende Anzahl an Bäumen auch weniger CO2 wiederaufgenommen werden, es kommt zur globalen Erwärmung der Erdatmosphäre. Dies begünstigt zusätzlich steigende Wasserpegel und heftige Regenfälle. Leidtragende davon sind oftmals die betroffenen Menschen.

Übersicht: Alle ORF-Angebote auf einen Blick

ORF

A4 Batson Scale (Batson et al., 1987), German version

Instructions: Erinnern Sie sich nun bitte zurück an den Nachrichtenartikel. Bitte beschreiben Sie Ihre Gefühle den geschilderten Personen gegenüber, während Sie den Artikel gelesen haben.

Drücken Sie dazu bitte zu jedem Adjektiv die entsprechende Ziffer auf der Tastatur.

Hierbei repräsentieren die Ziffern aufsteigend das Ausmaß, von 1 = überhaupt nicht, bis 7 = extrem.

	Überhaupt nicht			Mittel-mässig			Extrem
Alarmiert	1	2	3	4	5	6	7
Bekümmert	1	2	3	4	5	6	7
Mitfühlend	1	2	3	4	5	6	7
Fasziniert	1	2	3	4	5	6	7
Weichherzig	1	2	3	4	5	6	7
Aufgewühlt	1	2	3	4	5	6	7
Warm	1	2	3	4	5	6	7
Bedrückt	1	2	3	4	5	6	7
Gestresst	1	2	3	4	5	6	7
Betrübt	1	2	3	4	5	6	7
Verstört	1	2	3	4	5	6	7
Anteilnehmend	1	2	3	4	5	6	7
Aufgebracht	1	2	3	4	5	6	7
Beunruhigt	1	2	3	4	5	6	7
Weich	1	2	3	4	5	6	7
Besorgt	1	2	3	4	5	6	7
Berührt	1	2	3	4	5	6	7
Sorgenvoll	1	2	3	4	5	6	7
Beklemmt	1	2	3	4	5	6	7
Angespannt	1	2	3	4	5	6	7

Wie sehr haben Sie während des Lesens des Artikels die Gefühle der erwähnten Familienmitglieder nachempfunden?

Wie sehr sind Sie während des Lesens des Artikels in Bezug auf die geschilderten Ereignisse objektiv und neutral geblieben?

A5 Debriefing questionnaire

Instructions: Wir sind nun fast fertig.

Zum Abschluß wollen wir Ihnen aber noch ein paar kurze Fragen stellen.

Diese sollen uns helfen, den Ablauf des Experiments zu verbessern.

Wie interessant fanden Sie das Experiment?

Fünfstufige Beurteilungsskala von „sehr interessant“ bis „überhaupt nicht interessant“

Welchen Teil des Experiments fanden Sie interessanter?

Teil 1 (vor der Pause) / Teil2 (nach der Pause) / beide Teile waren gleich interessant

Würden Sie wieder mitmachen?

ja / nein

Ist Ihnen aufgefallen, dass es unterschiedliche Becher sind?

Ja, vorhin schon / ja, aber erst jetzt / nein

Welcher der Becher gefällt Ihnen besser?

Der vordere, ganz weiße / der hintere mit dem Logo / beide gleich gut

Was ist Ihrer Meinung nach der Hauptunterschied der Becher?

Design / Material / Größe / Glanz / anderer Hauptunterschied *(freie Antwort)*

Wie haben Sie die Becher ausgewählt?

Nach Gefallen / nach Bequemlichkeit / näher an mir dran / leichter zu befüllen / Material / weiß nicht / anderer Grund: *(freie Antwort)*

Wäre die Schätzaufgabe mit einer kleineren Karaffe leichter?

ja / nein

Waren die Becher groß genug?

ja / nein

Wie haben Sie die Abgabe der Speichelprobe empfunden?

Fünfstufige Beurteilungsskala von „sehr schwierig“ bis „sehr leicht“

Sollten größere Spuckbehälter zur Verfügung gestellt werden?

ja / nein

Sind die Arbeitsplätze groß genug?

ja / nein

Sind die Kopfhörer bequem genug?

ja / nein

B1 Multiple regression modeling tables for EAI higher order factors

Coefficients; dependant variable: changes in GEA

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,251	,173		-1,450	,148
	Instruktionsbedingung	,019	,045	,030	,412	,681
	reported objectivity	,005	,015	,025	,353	,724
	reported perspective taking	,004	,018	,018	,210	,834
	distress	,045	,017	,200	2,593	,010
	empathy	,010	,022	,040	,475	,635
	EAI subscale anthropocentric concern (pre)	,045	,024	,115	1,866	,063
	IRI Perspective Taking	,000	,004	-,002	-,037	,971
	IRI Fantasy	,004	,004	,064	,958	,339
	IRI Empathic Concern	-,009	,005	-,148	-1,978	,049
	IRI Personal Distress	-,001	,004	-,021	-,326	,745
2	(Constant)	-,253	,162		-1,563	,119
	Instruktionsbedingung	,019	,045	,030	,414	,680
	reported objectivity	,005	,014	,025	,356	,722
	reported perspective taking	,004	,018	,018	,208	,836
	distress	,045	,017	,200	2,605	,010
	empathy	,011	,022	,040	,477	,634
	EAI subscale anthropocentric concern (pre)	,045	,024	,115	1,870	,063
	IRI Fantasy	,004	,004	,064	,959	,339
	IRI Empathic Concern	-,009	,004	-,149	-2,095	,037
	IRI Personal Distress	-,001	,004	-,020	-,329	,743
3	(Constant)	-,248	,160		-1,552	,122
	Instruktionsbedingung	,022	,042	,035	,509	,611
	reported objectivity	,005	,014	,024	,336	,737

	distress	,046	,017	,204	2,726	,007
	empathy	,012	,021	,045	,577	,564
	EAI subscale anthropocentric concern (pre)	,045	,023	,117	1,941	,053
	IRI Fantasy	,004	,004	,066	,992	,322
	IRI Empathic Concern	-,009	,004	-,149	-2,100	,037
	IRI Personal Distress	-,001	,004	-,023	-,378	,706
4	(Constant)	-,215	,125		-1,714	,088
	Instruktionsbedingung	,018	,041	,029	,439	,661
	distress	,045	,017	,200	2,710	,007
	empathy	,010	,020	,038	,505	,614
	EAI subscale anthropocentric concern (pre)	,046	,023	,118	1,966	,050
	IRI Fantasy	,004	,004	,065	,979	,328
	IRI Empathic Concern	-,009	,004	-,149	-2,094	,037
	IRI Personal Distress	-,001	,004	-,022	-,367	,714
5	(Constant)	-,224	,123		-1,826	,069
	Instruktionsbedingung	,019	,041	,030	,453	,651
	distress	,044	,017	,197	2,690	,008
	empathy	,010	,020	,038	,501	,617
	EAI subscale anthropocentric concern (pre)	,046	,023	,118	1,968	,050
	IRI Fantasy	,004	,004	,062	,948	,344
	IRI Empathic Concern	-,009	,004	-,149	-2,110	,036
6	(Constant)	-,224	,122		-1,826	,069
	distress	,047	,016	,207	2,968	,003
	empathy	,012	,019	,045	,608	,544
	EAI subscale anthropocentric concern (pre)	,046	,023	,118	1,970	,050
	IRI Fantasy	,004	,004	,060	,913	,362
	IRI Empathic Concern	-,009	,004	-,152	-2,159	,032

	(Constant)	-,208	,120		-1,738	,083
	distress	,051	,014	,227	3,740	,000
7	EAI subscale anthropocentric concern (pre)	,046	,023	,119	1,989	,048
	IRI Fantasy	,003	,004	,058	,889	,375
	IRI Empathic Concern	-,008	,004	-,137	-2,081	,038
	(Constant)	-,165	,109		-1,508	,133
	distress	,053	,014	,233	3,849	,000
8	EAI subscale anthropocentric concern (pre)	,044	,023	,114	1,912	,057
	IRI Empathic Concern	-,007	,004	-,113	-1,883	,061

Coefficients; dependant variable: changes in Preservation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	-,314	,206		-1,526	,128
	Instruktionsbedingung	,063	,054	,086	1,179	,240
	reported objectivity	,007	,017	,027	,382	,703
	reported perspective taking	,022	,021	,088	1,040	,299
	distress	,037	,021	,136	1,765	,079
	empathy	,016	,026	,052	,616	,538
1	EAI subscale anthropocentric concern (pre)	,018	,028	,040	,648	,518
	IRI Perspective Taking	-,002	,005	-,021	-,321	,749
	IRI Fantasy	,003	,005	,049	,723	,470
	IRI Empathic Concern	-,009	,005	-,127	-1,697	,091
	IRI Personal Distress	-,003	,005	-,040	-,630	,529
	(Constant)	-,337	,193		-1,751	,081
2	Instruktionsbedingung	,064	,053	,087	1,189	,235
	reported objectivity	,007	,017	,028	,395	,693

	reported perspective taking	,022	,021	,086	1,019	,309
	distress	,037	,021	,138	1,791	,074
	empathy	,016	,026	,052	,625	,532
	EAI subscale anthropocentric concern (pre)	,019	,028	,040	,652	,515
	IRI Fantasy	,003	,005	,048	,708	,479
	IRI Empathic Concern	-,010	,005	-,135	-1,891	,060
	IRI Personal Distress	-,003	,005	-,035	-,567	,571
3	(Constant)	-,290	,150		-1,929	,055
	Instruktionsbedingung	,059	,052	,081	1,135	,257
	reported perspective taking	,021	,021	,083	,985	,326
	distress	,036	,021	,134	1,760	,080
	empathy	,014	,026	,045	,552	,581
	EAI subscale anthropocentric concern (pre)	,019	,028	,042	,684	,495
	IRI Fantasy	,003	,005	,047	,696	,487
	IRI Empathic Concern	-,010	,005	-,134	-1,884	,061
	IRI Personal Distress	-,003	,005	-,035	-,562	,575
4	(Constant)	-,278	,148		-1,870	,063
	Instruktionsbedingung	,061	,052	,083	1,167	,244
	reported perspective taking	,025	,020	,099	1,270	,205
	distress	,039	,020	,145	1,979	,049
	EAI subscale anthropocentric concern (pre)	,019	,028	,041	,664	,507
	IRI Fantasy	,003	,005	,044	,662	,509
	IRI Empathic Concern	-,009	,005	-,121	-1,806	,072
	IRI Personal Distress	-,002	,005	-,032	-,517	,605
5	(Constant)	-,295	,144		-2,046	,042
	Instruktionsbedingung	,060	,052	,081	1,148	,252
	reported perspective taking	,027	,019	,107	1,389	,166
	distress	,037	,019	,138	1,917	,056

	EAI subscale anthropocentric concern (pre)	,018	,028	,039	,647	,518
	IRI Fantasy	,003	,005	,040	,605	,545
	IRI Empathic Concern	-,009	,005	-,123	-1,843	,066
6	(Constant)	-,261	,133		-1,968	,050
	Instruktionsbedingung	,056	,052	,076	1,082	,280
	reported perspective taking	,028	,019	,111	1,450	,148
	distress	,038	,019	,142	1,983	,048
	EAI subscale anthropocetric concern (pre)	,016	,028	,035	,585	,559
	IRI Empathic Concern	-,008	,004	-,107	-1,747	,082
7	(Constant)	-,210	,100		-2,100	,037
	Instruktionsbedingung	,054	,051	,074	1,055	,292
	reported perspective taking	,030	,019	,118	1,563	,119
	distress	,039	,019	,145	2,041	,042
	IRI Empathic Concern	-,008	,004	-,113	-1,872	,062
8	(Constant)	-,223	,099		-2,246	,026
	reported perspective taking	,037	,017	,149	2,144	,033
	distress	,043	,019	,161	2,319	,021
	IRI Empathic Concern	-,009	,004	-,120	-2,000	,047

Coefficients; dependant variable: changes in Utilization

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,162	,246		,657	,512
	Instruktionsbedingung	,044	,064	,051	,686	,493
	reported objectivity	-,003	,021	-,011	-,148	,882
	reported perspective taking	,022	,026	,075	,863	,389
	distress	-,057	,025	-,180	-2,304	,022

	empathy	-,002	,031	-,007	-,079	,937
	EAI subscale anthropocentric concern (pre)	-,081	,034	-,149	-2,387	,018
	IRI Perspective Taking	-,002	,006	-,021	-,313	,754
	IRI Fantasy	-,004	,006	-,052	-,767	,444
	IRI Empathic Concern	,009	,006	,103	1,346	,179
	IRI Personal Distress	-,001	,006	-,012	-,188	,851
2	(Constant)	,157	,239		,659	,511
	Instruktionsbedingung	,044	,064	,051	,687	,493
	reported objectivity	-,003	,020	-,009	-,134	,893
	reported perspective taking	,021	,024	,072	,888	,375
	distress	-,058	,024	-,182	-2,390	,018
	EAI subscale anthropocentric concern (pre)	-,081	,034	-,149	-2,390	,018
	IRI Perspective Taking	-,002	,006	-,021	-,312	,755
	IRI Fantasy	-,004	,006	-,052	-,765	,445
	IRI Empathic Concern	,009	,006	,101	1,399	,163
	IRI Personal Distress	-,001	,006	-,013	-,195	,845
3	(Constant)	,139	,195		,712	,477
	Instruktionsbedingung	,046	,062	,053	,732	,465
	reported perspective taking	,022	,024	,074	,932	,352
	distress	-,057	,024	-,180	-2,408	,017
	EAI subscale anthropocentric concern (pre)	-,082	,034	-,150	-2,413	,017
	IRI Perspective Taking	-,002	,006	-,021	-,309	,758
	IRI Fantasy	-,004	,006	-,052	-,764	,445
	IRI Empathic Concern	,009	,006	,101	1,408	,160
	IRI Personal Distress	-,001	,006	-,012	-,194	,847
4	(Constant)	,127	,185		,687	,493
	Instruktionsbedingung	,045	,062	,052	,727	,468
	reported perspective taking	,023	,023	,077	,974	,331

	distress	-,058	,023	-,183	-2,484	,014
	EAI subscale anthropocentric concern (pre)	-,082	,034	-,150	-2,424	,016
	IRI Perspective Taking	-,002	,006	-,017	-,267	,790
	IRI Fantasy	-,004	,006	-,054	-,797	,426
	IRI Empathic Concern	,008	,006	,099	1,397	,163
5	(Constant)	,109	,172		,634	,527
	Instruktionsbedingung	,046	,062	,053	,737	,462
	reported perspective taking	,022	,023	,074	,949	,343
	distress	-,057	,023	-,180	-2,474	,014
	EAI subscale anthropocentric concern (pre)	-,082	,034	-,150	-2,423	,016
	IRI Fantasy	-,005	,006	-,054	-,805	,422
	IRI Empathic Concern	,008	,006	,093	1,383	,168
6	(Constant)	,109	,172		,630	,529
	reported perspective taking	,029	,021	,097	1,357	,176
	distress	-,053	,023	-,168	-2,371	,018
	EAI subscale anthropocentric concern (pre)	-,083	,034	-,152	-2,477	,014
	IRI Fantasy	-,005	,006	-,060	-,904	,367
	IRI Empathic Concern	,008	,006	,091	1,343	,180
7	(Constant)	,047	,158		,297	,767
	reported perspective taking	,028	,021	,094	1,320	,188
	distress	-,055	,022	-,173	-2,437	,015
	EAI subscale anthropocentric concern (pre)	-,080	,033	-,147	-2,398	,017
	IRI Empathic Concern	,006	,005	,066	1,072	,285
8	(Constant)	,150	,126		1,193	,234
	reported perspective taking	,031	,021	,104	1,476	,141
	distress	-,052	,022	-,163	-2,315	,021

	EAI subscale anthropocentric concern (pre)	-,086	,033	-,157	-2,604	,010
9	(Constant)	,210	,119		1,759	,080
	distress	-,034	,019	-,108	-1,807	,072
	EAI subscale anthropocentric concern (pre)	-,079	,033	-,146	-2,426	,016

B2 Open answers given by participants in debriefing questionnaire

Other main difference between cups (n = 59):

"Bio"-Aufdruck VS. kein Aufdruck

"Ökologisches Pickerl"

Art der Herstellung

aufbau der Becher

aufdruck

Aufdruck

Aufdruck von greenway, sind aber dieselben nur dass greenway damit wir uns ökobewusster fühlen die wasserdichte Glazfolie innen hineingegeben hat um einen Aufpreis für ein ebenso schlechtes Produkt verlangen zu können

Beschriftung

Bodenfläche und Winkel

dass, die einen Becher vermuten lassen, dass sie aus recyclebaren material gemacht wurden, oder schonender für die umwelt sind, und den benutzer als ökolokischen denker ckathegoriesiert... eher umweltbewusster

der eine Becherstapel ist ökologisch hergestellt worden

die Aufschrift und Farben

durch die unterschiedliche konische Form lässt sich das Volumen schwerer einschätzen

einer "Umweltbewusst" der andere nicht

eins ohne Beschriftung

ersichtliche Mengenangabe auf einem der beiden Becher

erwecktes umweltbewusstsein

Form

Form (Diameter am Boden zu Diameter am Becherrand)

Geschmack

Glanz(Beschichtung)

greenway sind umweltfreundlicher

greenway und noname

greenwaybecher ist biologisch abbaubar

GRöße, glanz

Größe, Position auf Tisch

habe darauf überhaupt nicht geachtet, es mir nicht einmal angesehen.

logo

Marke (bio/nicht bio)

nichts ist mir mehr egal

normal / ökologisch betrachtet

Nutzen: einer für Werbung, einer für Konsum

offensichtlich ökologisch

öko

Öko-Hinweis

Ökologie

ökologisch

ökologisch und nichtökologisch

ökologisch vs "normal"

ökologisch! das war eine falle. ihr wolltet wissen wie umweltbewusst wir sind. is mir leider erst im nachhinein eingefallen

Ökologischer Unterschied (recycled)

Recycelbarkeit

recyclelt und nicht recycelt

Recycling-Papier

Recycling?

schrifft

sie sind ökologisch hergestellt

Stabilität des Bechers

umweltfreundlich

umweltfreundlich hergestellt oder nicht

Umweltfreundlichkeit

Umweltfreundlichkeit/ -verträglichkeit

vermutlich Recyclebarkeit

vielleicht Recycling-Pappe?

wirkt umweltbewusster

Other reason for choosing cups (n = 67):

"greenway" ist evtl wiederverwertbar

"Öko"-Aufschrift (greenway)

0,2l Anzeige beim Näheren zuerst gesehen

0,2l Markierung hat zu mir geschaut

1. Nähe 2. weil recycelt

Audruck - scheint so Öko/natürlich

Auffälligere 0,2l markierung -> leicher 75g abzuschätzen

Aufgrund des Schriftzuges "Greenway"

Becher sieht umweltfreundlicher aus

Bequemlichkeit

Beschriftung

Bessere Höhenabschätzung

dachte es sind beide gleich

Der Becher, bei dem sich die Füllmenge leichter abschätzen ließ.

Der eine Becher gibt vor, 'green' herrgestellt worden zu sein. (Stimmt wahrsch. nicht!)

dickerer Strich bei der Maßeinheit - übersehen, dass der andere der "umweltfreundliche" ist

die Aufschrift leider zu spät betrachtet

Die nicht ökologischen Becher standen mit der 0,2l-Beschriftung in meine Richtung, bei den anderen Bechern habe ich die Beschriftung nicht sofort gesehen. Deswegen die nicht-greenway.

die, die ich als erstes erwischt habe

Einer war ein Öko-Becher, den hab ich genommen

ekologisch

Entscheidungsdiffusion durch Artikel (erkannte ich erst jetzt, dass ein Pickerl drauf ist?)

erster: weil näher dran, zweiter: zum ausgleich

es war mir völlig egal

Form d. becher

form(läner) und design

gegen meine Einstellung zum Umweltschutz -> "nicht bio" Becher

greenway aufschrift :-)

greenway heisst nur Werbung

Größenangabe (0,2l)

Hab gerade erst bemerkt, dass es Unterschiede gibt...

hab nicht gemerkt das sie unterschiedlich sind

hab nicht richtig hingeschaut, sonst hätt ich den andren genommen

habe den Becher mit der Aufschrift " greenway" gewählt, wählt bei der Herstellung dieser Becher auf die Umwelt geachtet wird

Habe die weiter vorne Stehenden, leider auch wahrscheinlich schlechter Recycelbaren gewählt. Das ist mir im Nachhinein unangenehm und tut mir Leid

habe nicht bemerkt das sie unterschiedlich sind

habe nicht gemerkt, dass Becher verschieden sind

hatte eine Markierung (0,2l) an der ich mich orientieren konnte

Ich dachte, dass Green-way irgendein logo ist und habe nicht auf den tieferen sinn geachtet...gleich nach beendigung des ersten teils ist es mir aufgefallen-danach nahm ich einen green-way becher zum trinken!

instinktiv

jeweils 1

jeweils einen

logisches Überlegen, sah keinen Unterschied also nahm ich den neutralen

Logo auf dem Becher

Markierung feiner

mir ist zu dem zeitpunkt der unterschied nicht aufgefallen

nach abstammung und herstellung schätzend habe ich den becher für ökologische denker gewählt, da ich vermute dass diser aus "schonenderen" materialen hergestllt wurde

nach dem Außenmaterial, bin dann aber draufgekommen dass es dasselbe material ist nur dass die glänzende folie bei greenway innen ist

nach der Aussage "for ecological thinking people"

Öko-Becher vs. normaler Becher

ökologischer Gedanke

sah bis jetzt keinen unterschied, hab sie mir nicht genau angeschaut, dachte es sind einfach zwei stöße vom selben becher

scheint kleiner zu sein

Struktur des Bechers

um beide Becherstapel gleich hoch zu bekommen

umweltfreundliche Herstellung

umweltfreundlicher

umweltschonend hergestellt

Umweltschutz - Bericht

Unterschied nicht bemerkt

viel erst nach der Pause der "Öko-Becher" auf

Wegen der Fragen im Test (Bezug auf Umwelt)

zuerst den näher liegenden, nach dem umweltthema greenway

zuerst nach Nähe zu mir- vor dem Test, dann Material

zufall, der weisse war näher

zufällig

Zum Schätzen habe ich den schmalen Becher genommen, weil er sich nicht so stark ausweitet

C Zusammenfassung auf Deutsch (German Abstract)

Umweltfreundliches Verhalten, weitläufig definiert als bewusster und nachhaltiger Umgang mit natürlichen Ressourcen, wird zu einem zunehmend an Bedeutung gewinnenden wichtigen Bestandteil alltäglichen Lebens, um die Ausbeutung natürlicher Öko-Systeme durch den Menschen einzudämmen. Dem zugrunde liegt ein komplexes und heterogenes Konstrukt mit vielen verschiedenen Faktoren und Motivationen. Ziel dieser Studie ist es, herauszufinden ob empathisches Einfühlungsvermögen hervorgerufen durch das Lesen einer detaillierten Schilderung von Personen, die unter den Folgen von Umweltverschlechterung leiden, dazu genutzt werden kann, um umweltfreundlichere Einstellungen und dementsprechendes Verhalten hervorzurufen. Zusätzlich wird untersucht, ob das individuelle Ausmaß, in dem in der Zukunft liegende Belohnungen an Wert verlieren, signifikant mit ebensolchen Einstellungen und solchem Verhalten zusammenhängt. Eingesetzt wurde ein zweifaktorieller Versuchsplan mit abhängiger Stufe; in der Versuchsbedingung wurden VPn instruiert, sich während des Lesens in die geschilderten Personen hineinzuversetzen, während sie in der Kontrollbedingung objektiv bleiben sollten. Als abhängige Variablen fungierten Veränderungen im vorgegebenen Fragebogen zu Umwelt-Einstellungen (EAI) sowie die Wahl seitens der VPn, sich entweder einen Einweg- oder einen Recycling Pappbecher zu nehmen. Die allgemeine Einstellung zur Umwelt verbesserte sich in der Empathie Bedingung, allerdings wies dies nur eine kleine Effektgröße auf. Dieser Umstand lässt sich wahrscheinlich auf einen geringen Übertragungseffekt zurückführen, da sich bei EAI Items mit thematisch spezifischem Bezug zum vorgegebenen Text ein eindeutigerer Anstieg umweltfreundlicher Einstellungen feststellen ließ, unabhängig von der Instruktionsbedingung. Des Weiteren stellte die persönliche Betroffenheit (engl.: distress) im Vergleich zur empfundenen Empathie einen zuverlässigeren Prädiktor für Veränderungen in der Einstellung zur

Umwelt dar. Ebenfalls unabhängig von den Instruktionsbedingungen, wählte ein signifikanter Anteil an VPn nach dem Lesen des Textes einen anderen Becher als vorher. Da die Daten keinen aussagekräftigen Schluss zulassen, ob die primäre Motivation hierfür tatsächlich war, umweltfreundlich zu Handeln, stellt dies einen potentiellen Untersuchungsgegenstand zukünftiger Forschung dar. Das individuelle Ausmaß, in dem zukünftige Belohnungen an Wert verlieren, stand schlussendlich in keinerlei signifikantem Zusammenhang zu umweltfreundlichem Verhalten oder Einstellungen.

CURRICULUM VITAE

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2006: enrolment in psychology at University of Vienna / Austria

2008 – 2010: studied Biology at University of Vienna / Austria, discontinued 2010

1995 – 2004: attendance of Albert-Schweitzer Gymnasium in Kaiserslautern / Germany (2004 successful completion with Abitur)

EXPERIENCE

Since 05/2012: Outreach social worker within the *Fair-Play project* initiated by the City of Vienna (working in the 22nd district, for supporting association *Wiener Kinderfreunde*; from 07/2012 – 09/2012 also in the 14th district, f*or Kiddy & Co)*

12/2010 – 05/2012: project assistant within the fMRI-research project "Influence of prodynorphin genetic variation on striatal functions and brain activation" at the Social, Cognitive and Affective Neuroscience Unit of the Department of Basic Psychological Research and Research Methods at the Faculty of Psychology of the University of Vienna, in cooperation with the Medical University of Vienna

10/2011 – 01/2012: Student research assistant at the Social, Cognitive and Affective Neuroscience Unit of the Department of Basic Psychological Research and Research Methods at the Faculty of Psychology of the University of Vienna

2010/2011: Student Advisor within the Supervised Orientation Tutorium for freshman psychology students (in the context of the seminary course Educational Psychology II)

14.06.2010 – 20.08.2010: Participation in the Summer Programme in Undergraduate Research on Neuroscience (SPUR-ON 2010) at the *Royal College of Surgeons in Ireland*

in Dublin, and the *National University of Ireland / Maynooth.* This involved being part of the research team conducting the EEG study "Adolescent Brain Development and Risk for Psychosis"

10/2009 – 03/2010: Internship at the Brain-Research-Lab of the Department of Clinical, Biological and Differential Psychology at the University of Vienna

2009: Test administrator at the University of Vienna for acquiring data from English native speaking children and adolescents to standardize the translated English version of the AID-2 (Adaptive Intelligence Diagnosticum for 6-16 year olds)

Since 2007: Child- and youth worker with the *Wiener Kinderfreunde* in Vienna / Austria. Since 2009 team leader at local youth club

2004 – 2005: civilian service at the Orthopaedagogical Kindergarten in Kaiserslautern / Germany

IT-SKILLS

SPSS, MS Office, basic skills with EEGLAB

PUBLICATIONS

Murphy, J., Rawdon, C., Kelleher, I., Twomey, D., **Markey, P.**, Cannon, M., & Roche, R. (2013). Reduced duration mismatch negativity in adolescents with psychotic symptoms: further evidence for mismatch negativity as a possible biomarker for vulnerability to psychosis. *BMC Psychiatry*, *13*(1), 45.