Outlooks on Applying Environmental Psychology Research

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Editorial

Many findings of environmental psychology are directly relevant for nature conservation work and communication, but still rather little edited to a form that matches the needs of the people working in the field. In order to tap this potential, the Social Psychology Department of the University of Leipzig, the University of Koblenz-Landau, the Forestry Research Center Baden-Württemberg (FVA) and the Federal Agency for Nature Conservation (BfN) have designed a series of workshops held over the past three years (2014 to 2016). Representatives of nature conservation authorities and associations, environmental politicians, voluntary conservationists, natural scientists, psychologists, political scientists and general scientists were invited to discuss and make use of the findings of modern environmental psychology for nature conservation and nature protection communication.

All three workshops used very different ways broaching the issue of psychology in nature conservation: The first workshop addressed the topic of Nature Conservation Communication (2014), the second dealt with Nature Experience and Mindfulness (2015), and the very recent third workshop was held in the form of an international summer school on environmental psychology (2016). For four days PhD students and other young researchers in the field of Environmental Psychology met with three international experts to discuss and work on current findings from environmental psychology and their own scientific work on the Baltic island of Vilm. Ten young researchers also presented their current projects as speakers (for the program see Appendix A). The high number of applications highlights the relevance of as well as the huge interest in the topic among young psychologists.

All workshops were funded as part of the Framework of Superordinate Goals on Communication and Education of the Federal Agency for Nature Conservation: The National Strategy on Biological Diversity (NBS), which serves to implement the Convention on Biological Diversity at the national level also outlines Germany's contribution to the conservation of biological diversity worldwide. For this program to be successful communication and information as well as developing persuasion strategies for nature conservation are of highest importance not only towards primary stakeholders, but for eliciting diffusion processes in society as a whole. In order to reach this goal, the development and implementation of tailored courses for a broad range of target groups is explicitly stated in the National Strategy (action area C 14, education and information).

In accordance with these guidelines the above mentioned series of workshops made use of important findings of psychological research, which have not yet received much attention in nature conservation communication and practical nature conservation work. We see the workshop-series as an impulse towards new approaches of successful nature conservation communication in the political arena by providing inspiring theoretical foundations and strategic arguments. In addition, the workshops served to raise a broader public awareness of the issues of nature conservation communication.

The organizers would like to thank the authors of this volume as well as all the participants of the summer school for the lively exchange during the conference.

Best regards,

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1 Environmental Psychology – Its scientific merit and the need for future research

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This chapter will provide a brief introduction into environmental psychology and its role both within the scientific field of psychology as well as its interdisciplinary relevance. It will then summarize the contributions of this issue, highlighting the necessity of scientific exchange and the promotion of young scholars in the field of environmental psychology. Finally, core issues for the future development of environmental psychology will be provided.

1.1 Environmental psychology

From own anecdotal experience as well as from discussions with colleagues, it seems that environmental psychologists are often asked what exactly they are doing. So, while the answer seems quite simple for those doing research in environmental psychology, it apparently is not in the non-psychological public. Usually, environmental psychologists do not cure trees in psychotherapy, nor do they (necessarily) suit-up as penguins to live in Antarctica and study societal change processes in penguin collectives. Environmental psychology as we understand it deals with the impact of the – both natural and built – environment on the human psyche and human behavior and vice versa. That is, environmental psychologists also seek to understand how the human psyche affects the environment via human behavior. So, on a very basic level, environmental psychology can be defined as the sub-discipline of psychology that deals with human-environment interactions. As such, it is a research field that depends strongly on the input of other disciplines and policy decisions, making it an inter- and transdisciplinary endeavor.

More specifically, environmental psychology deals with a variety of research topics concerning the natural but also built environments and their interaction with human beings. Without foreclosing too much of the contributions compiled in this issue, it is evident that environmental psychology research can inform us about the catalysts and barriers that prevent and enable pro-environmental behavior. Over the past decades, a number of theoretical and empirical models were designed that took into account the human psyche in response to the environmental crises, revealing the role of psychological concepts such as attitudes, norms, behavioral control, efficacy but also political ideology, moral values, routines, just to name a few (for a detailed overview of such variables, see for example Bamberg & Möser, 2007; Bator, Tabanico, Walton & Schultz, 2014). More recently, researches began acknowledging that beyond such individualistic variables, models of collective behavior need to be taken into account when it comes to the appraisal of and response to environmental problems (Fielding & Hornsey, 2016; Fritsche, Barth, Jugert, Masson & Reese, 2016). The reader of this issue will experience the manifold approaches current research in environmental psychology addresses.

Yet, it is evident that psychological concepts and processes alone will not suffice to combat climate change and environmental problems in general. Environmental psychology is – by

definition – concerned with environmental issues, which, in turn, are multidisciplinary determined. Technological innovations as well as policy making and infrastructural capacities influence people's environmental appraisals and responses so that these have to be taken into account. For example, policy-induced fees for plastic bags can reduce plastic bag use drastically (as shown in Ireland) and providing and supporting use of alternative energies can increase their acceptance. Thus, it is one task of environmental psychologists to show how, and under which conditions, humans act pro-environmentally within their meso- and macrostructures. Saying that, one other task is to convince policy and decision makers to provide structures, benefits and "nudges" that are built on rigorous psychological theoretical and empirical work. The subsequent contributions provide guidance. In concert, this multi- and transdisciplinary cooperation could ultimately bring forward a more environment conscious humanity.

1.2 Contributions of this issue

The work that is compiled in this issue shows how passionate and professional both young and senior scholars contribute to the research body in environmental psychology. While the work assembled for this issue represents many different approaches to understanding environmental behavior, they all address and identify its underlying processes. In the following, the contributions will briefly be summarized, following the order in this issue.

Over the past decades, psychological research revealed that pro-environmental behavior is strongly influenced by social norms (i.e., specific behavioral rules that guide behavior in groups and societies). For example, it has been shown that information about how our social surroundings – such as neighbors or fellow hotel guests – act affects our own behavior. Building on these premises, Hamann (2017; Chapter 2) presents an innovative approach to understanding how different kinds of social norms (e.g. Reese, Loew & Steffgen, 2014) affect everyday behavior. In her field experiment addressing the decision to attach an anti-ads sticker to one's mailbox, Hamann shows that descriptive and injunctive norms combined seem most promising in motivating behavioral change: When households without sticker perceived a high number of neighbors using anti-ads stickers (a descriptive norm) while at the same time receiving a prompt that "we should really do something about waste" (an injunctive norm) resulted in highest sticker attachment rates. This intervention significantly contributed to waste reduction, and nicely illustrates how strongly normative information influences pro-environmental behavior.

The work by Römpke (2017; Chapter 3) builds on one of the most influential lines of social psychological prejudice research – the contact hypothesis. In her work, she brings together this research with global challenges humanity is facing. Specifically, she argues that transnational contact does not only reduce prejudice but also increases the feeling that humans belong to one large ingroup. This so-called global identity is then related to responses (e.g., behavioral intentions) addressing global challenges such as climate change. In other words, her research reveals that contact to people from other cultures can be helpful in building a truly cooperative human identity that acts in concert vis-á-vis the challenges humanity is currently faced with. It is evident that organizations and policy makers could use such findings in order to promote action and change on various levels of society. Specifically, one could think of creating and developing social norms that focus on global challenges rather than parochial self-interests.

Social-psychological processes such as identification and norms also come into play when local communities form pro-environmental, grass-root initiatives. The framework and first initial data by Sloot, Jans and Steg (2017; Chapter 4) convincingly suggest how such initiatives emerge, and how they can promote pro-environmental engagement. Most importantly, their proposed model promotes the idea that personal motivation among individuals, interaction with others and the negotiation of a common ground are key facets of a pro-environmental community. Once established or in the process of becoming, Sloot and colleagues argue that in-depth interaction and defining common values result in the formation of a "community identity" that in turn will foster cooperation towards pro-environmental goals. Nicely corroborating to the other contributions in this issue (e.g., Fritsche, 2017; Hamann, 2017; Römpke, 2017), the findings of this research reveal that collective processes of social identity are a yet underrepresented but highly informative construct in understanding – and strengthening – pro-environmental action.

In assessing how people respond to forecasts of certain environmental events, Hohle and Teigen (2017; Chapter 5) show that individuals tend to evaluate revisions of information as trends. Specifically, across various behavioral experiments, their participants received information about experts' revised forecasts of events (i.e., a prognosis at one point in time changed at another). While all participants received the same information of a current prognosis, half of them read about a previous prognosis that was lower, and one half read about a previous prognosis that was higher. Results indicate that participants forecasted further changes in the same direction. These results are highly relevant when it comes to communicating environmental risks and understanding people's responses to such risks. Hohle and Teigen intriguingly reveal that we are susceptible of such subtle changes in informational content and context so that both media as well policy makers and (environmental) scientists have to take care in presenting such prognoses.

Directly addressing what the public thinks about pro-environmental behavior vis-á-vis other social themes such as economic growth is analyzed by Drews (2017; Chapter 6). He criticizes the often used dichotomy of economic growth *or* environmental protection – a simplified distinction that may not cover responses the public would set in between. In a study representative of the Spanish population, Drews extracted various facets of the public's views on economic growth (e.g., prosperity, limits, setting wrong priorities), with a specific focus on the economy-environment relations. The study's results reveal that the public perceived this relation as rather complex, showing that the majority of respondents favored economic growth while at the same time demanding environmental sustainability. Among other highly relevant findings, the data also point to the importance of social identity variables such as religion or political ideology when it comes to assessing economic growth. Both policy making and the media can make use of this study by more strongly endorsing alternatives of the mere pro- vs. anti-growth distinction.

The importance of lay people's perceptions when it comes to sustainability issues is also addressed by Bösehans (2017, Chapter 7). In a new and creative approach he assessed people´s view on sustainable cities, having them play the urban simulation game Sim City. Participants took the role of an urban planner and were asked to build the most/least sustainable city they could imagine within an experimental setting. Bösehans could show, that people considered many important aspects of sustainable cities such as sustainable transport or energy and disclosed even facets that theorists in the field did not look at so far, but showed fewer awareness of less public debated factors like compactness and mixed land use. These results can be of great help for decision makers and urban planners to prevent

misapprehensions when communicating plans or to make people participate in the process of designing their city.

Finally, Immo Fritsche (2017, Chapter 8) provides an integrative outline of how social identity variables may advance the prediction of people's pro-environmental intentions and behavior. Specifically, he is focusing on the role of ingroup identification, collective efficacy beliefs, and ingroup norms that interact in determining group members' environmental decisions. Importantly, these effects are not just important for explaining face-to-face interactions in environmental action groups but generalize to any behaviors, such as individual consumption decisions (e.g., using electric cars) made by members' of any groups (e.g., citizens of a country or "the young generation"). Thus, pro-environmental interventions and policies are well-advised to engage people's various group identities to foster citizens' sustainable action.

1.3 The future of environmental psychology

The work in this issue gives hope with respect to three core points. First of all, environmental psychology acknowledges that climate change and virtually all other environmental degradation problems are human made – and could thus be dealt with by collective human efforts. Second, environmental psychology research is characterized by such collective efforts: As the research presented in this issue shows, a growing number of researchers collaborate with the goal to understand human behavior vis-á-vis the (natural) environment, providing explanations for why humans do not act in favor of the environment. And third, as the following chapters and the remainder of this issue show, environmental psychology itself is facing a bright future. In recent years, the field has attracted more and more students and young scholars who became active in investigating antecedents and consequences of environmental behavior. What's more, the field becomes increasingly internationalized, and its research is often placed both in high-impact psychological and interdisciplinary journals but also in more publicly popular outlets. The media have become aware of environmental psychologists' work alike, giving "us" the opportunity to show the public how environmental action – be it pro- or contra-environmental – is shaped psychologically and the increased number of evidence based guidelines for people working in the field illustrate the exemplary communication between researchers and operators in this field.

However, despite the increasing academic development and sophistication of environmental psychology, environmental psychologists have to keep in mind that among the broader public and even decision makers and intervention experts psychological variables and methods are broadly neglected when it comes to initiating behavior change programs. For instance, as reported in this volume (Fritsche, 2017), it has repeatedly been shown that the effect of social norms is underestimated. Instead, lay persons often consider "realistic" incentives or barriers, such as low prizes or infrastructure (e.g. for running electric cars) much more important than "soft" factors. Environmental psychology has the data to refute these lay views. However, this takes time and effort, as it is commonly known how easy it is to chance social schemata of how social behavior apparently works. The same is true for psychological methods, such as, for instance, experimentation in the behavior lab or in controlled field studies, which are still a rare exemption when preparing or testing interventions. With the present volume, we hope to push this a step forward and to demonstrate the intriguing power psychological theories and methods have when being used for understanding and preparing the ecological transformation.

References

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of environmental psychology*, *27*(1), 14-25.

Bator, R. J., Tabanico, J. J., Walton, M. L., & Schultz, P. W. (2014). Promoting energy conservation with implied norms and explicit messages. *Social Influence*, *9*(1), 69-82.

Fielding, K. S., & Hornsey, M. J. (2016). A Social Identity Analysis of Climate Change and Environmental Attitudes and Behaviors: Insights and Opportunities. *Frontiers in Psychology*, *7*.

Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2016). A Social Identity Model of Pro-Environmental Action (SIMPEA). *Unpublished Manuscript.*

Reese, G., Loew, K., & Steffgen, G. (2014). A towel less: Social norms enhance pro-environmental behavior in hotels. *The Journal of social psychology*, *154*(2), 97-100.

2 Sticker in the Box! The influence of injunctive and descriptive norms on anti-ads sticker use

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Hamann, K. R. S., Reese, G., Seewald, D. & Loeschinger, D. C. (2015). Affixing the theory of normative conduct (to your mailbox): Injunctive and descriptive norms as predictors of anti-ads sticker use. *Journal of Environmental Psychology, 44*, 1–9.

Figure 1: An exemplary mailbox (Picture: Karen Hamann)

Social norms strongly influence pro-environmental behavior. In a field study, we tested both injunctive and descriptive norms' influence (explanation follows) on the decision to attach an anti-ads sticker to one's mailbox. We manipulated and observed descriptive as well as injunctive norms in a natural setting with 383 households. In support of our hypothesis, the highest sticker attachment rates occurred when salient pro-environmental descriptive and injunctive norms were combined. An injunctive norm with a general reference frame turned out to be most effective.

2.1 Anti-ads stickers

Large amounts of free newspapers and advertisements end up in people’s mailboxes on a daily basis. In Germany and other European countries, one can refrain from receiving this kind of mail by simply putting an anti-ads sticker on one's mailbox. That is why many environmental organizations distribute anti-ads stickers at public relation stands and promote their attachment to mailboxes (BUND, 2007). However, only 15 percent of the German population owns a mailbox that has an anti-ads sticker attached to it, according to a survey with approximately 20,000 German participants (Statista, 2008). In contrast, the BUND (2007) assumes that 85 to 90 percent of the newspapers and ads are thrown away unread. This discrepancy could have several reasons. Firstly, some people might like to receive a few newspapers and advertisements. Secondly, some German households could be willing to put a sticker on their mailbox, however, do not know of a nearby opportunity to obtain a sticker. Thirdly, social factors in people’s direct environment might impede an environmental protective behavior. Our study will further investigate the second and third interpretation. In 2010,

an average of 248 kg paper was consumed by each German citizen (Forum Ökologie und Papier [FÖP] & Förderverein für umweltverträgliche Papiere und Büroökologie Schweiz, 2012). According to the FÖP, this is 191 kg above the world's average which makes Germany one of the ten most paper consuming countries. According to another study with an Austrian sample, 33 kg of free newspapers and advertisements per year are distributed to households that did not refrain from their delivery (Wassermann, Schneider, Hingsamer, Steyer, & Zinöcker, 2004). It should be noted that the following estimations are partially based on data from Austria, where the consumption of paper is slightly higher than in Germany (additional 16 kg on average). On the basis of the Austrian study and the data of resource wastage per kilogram of paper taken from the FÖP (2012), we estimate that a German household consumes 48.4 kg of wood fiber, 1265 L of water, 132 kW/h of energy, and releases 33 kg of CO2 annually – merely by receiving free newspapers and advertisements. Likewise, the use of printing colors and glue contribute to the pollution of our environment (Umweltbundesamt, 2012). Therefore, promoting the use of anti-ads stickers against unwanted advertisement and free newspaper significantly contributes to successful waste reduction (Wassermann et al., 2004).

2.2 Social influence

Social influence is an important source of motivation and appears to be the driver of many pro-environmental actions such as recycling behavior (Schultz, 1999, see also Fritsche (2017) and Sloot, Jans & Steg (2017) in this issue). Most people usually underestimate the influence that other people's attitudes and behaviors have on their own personal decisions – including environmental campaigners (Nolan, Kenefick, & Schultz, 2011). Consequently, campaigns and environmental actions are typically directed at individual agents without taking into account their social environment and connections. That is why we tested to what extend the underlying social conditions of a situation can facilitate pro-environmental behavior (for the influence of friendships see also Römpke (2017) in this issue). The present study examines this question from the perspective of the focus theory of normative conduct (Cialdini, Reno, & Kallgren, 1990). Its assumptions have been tested in various social and environmental psychological studies with numerous behaviors, e.g. littering (Cialdini et al. 1990), towel reuse in a hotel setting (Goldstein, Cialdini, & Griskevicius, 2008), wood theft (Cialdini, 2003), energy conservation (Göckeritz et al., 2010), and recycling behavior (Schultz, 1999). Cialdini et al. (1990) distinguish two types of social norms: injunctive and descriptive norms. An injunctive norm indicates whether the majority of a social group approves or disapproves a certain behavior. It represents an “ought-norm” because its messages are prescriptive. For example, when we think about other people's opinion on meat consumption while walking to the cafeteria, we are thinking about an injunctive norm. Descriptive norms express the popular (Cialdini, 2003) and typical (Cialdini et al., 1990) behavior that is shown by the majority of a social group. In contrast to an injunctive norm, a descriptive norm represents the actual behavior of people. It reflects an “is-norm” that exists despite its moral component. If I don’t know the route to a concert and follow the crowd, I’m guided by a descriptive norm. Both, injunctive and descriptive norms, influence individuals via the perception of these norms. Cialdini et al. (1990) emphasize that the effectiveness of a norm is altered by its dispositional and temporary salience. Their studies indicate that norms can only unfold their entire impact when they are focused by the target person. For example, a sign next to the road asking car-drivers to slow down draws attention to the injunctive norm

of secure driving behavior. If there was no sign, the norm would have a weaker influence on the car-drivers' behavior.

Cialdini (2003) states that the two norm types can only unfold their full persuasive power when they are aligned. Additionally, the influence of social norms depends on the social group from which the norm originates. Fornara, Carrus, Passafaro, and Bonnes (2011) state that pro-environmental behavior with a local nature (e.g. putting an anti-ads sticker on one's mailbox) is especially influenced by people in the same place (e.g. the percentage of nearby neighbors already using an anti-ads sticker), regardless of their personal connection. This type of norm is referred to as local norm (Fornara et al., 2011). In a study by Goldstein et al. (2008) the local descriptive norm (determined by hotel guests in exactly the same room) had a stronger impact on towel-reuse behavior than a general descriptive norm (communicated by the behavior of all hotel guests; see also Reese, Loew, & Steffgen, 2014).

2.3 The current study

By introducing a new behavior to social norms research, our study contributes profoundly to the transferability of research results. The specific goal of our field-experiment was threefold. First of all, we aimed to test the combined influence of descriptive and injunctive norms on people's behavior. To do so, we manipulated injunctive norms (via messages saying that it is good to protect the environment and attach an anti-ads sticker), observed descriptive norms (via percentage of direct neighbors with anti-ads stickers on their mailboxes) and tested their effects after a time lag of three weeks. Second, we aimed to test whether an injunctive norm could be strengthened by either providing a local or a general frame (neighborhood vs. city framing of the message). And third, we aimed to establish research that focuses on a real life setting that allows substantial waste reductions with very little behavioral costs. Participants were only households without an anti-ads sticker prior to the intervention.

2.4 Essential Results

As many other researchers, we share the opinion that psychology aims to work on solutions for real-life problems and to convey this knowledge to practitioners (cf. Reese, Fritsche & Römpke (2017) in this issue, see Steg, van den Berg, & de Groot, 2013). Social norms are one influential means to encourage individual actions. As a consequence of our field experiment, a total of 16% of the 383 subject households attached an anti-ads sticker to their mailbox across all conditions. Taking into account the number of people who considered putting a sticker on their mailbox, and implications of this action for their daily life, the overall success rate is quite substantial. As predicted, we found more stickers to be attached when the pro-environmental injunctive norm was salient (vs. not salient) and the pro-environmental descriptive norm was strong (vs. weak). This means that more stickers were attached if participants received a message that carried an injunctive norm message (“environmental protection is good”) and if a lot of neighbors had already attached stickers to their mailboxes. The strongest effects were observed in the condition combining a salient injunctive norm with a strong pro-environmental descriptive norm. Unexpectedly, a general reference group in the injunctive norm message was superior to a local one.

2.5 Implications for environment protection interventions

Our study indicates that an intervention to distribute anti-ads stickers is in any way very useful. In most of the tested neighborhoods, the increase of anti-ads stickers was higher than the total German average. The resources saved per year by our intervention with 63 households that attached the sticker sum up to about 3000 kg of wood fiber, 80,000 L of water, 8500 kW/h of energy as well as a prevention of the release of 2000 kg CO_2. If attention is paid to the advices derived from our results, an even bigger contribution to environmental protection can be made. Focusing on an injunctive norm on the one hand ("one should attach anti-ads sticker to the mailbox") and having a high descriptive norm on the other hand (many direct neighbors already own a sticker) can increase the effectiveness of such an intervention enormously. If the number of anti-ads-stickers is limited, we advise practitioners to focus mainly on people with many neighbors who already have a sticker. Having an unlimited amount of stickers, it is sensible to insert one sticker into every mailbox. The sticker should always be combined with a message that focuses on pro-environmental and pro-sticker injunctive norms. Additionally, we recommend addressing a general reference group on the message (e.g. addressing households as citizens).

References

BUND. (2007). Unerwünschte briefkastenwerbung stoppen [Stopping undesired print advertisement]. Retrieved July 27, 2013 from http://www.bund.net/nc/service/ oeko-tipps/detail/artikel/unerwuenschte-briefkastenwerbung-stoppen/.

Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science*, 12, 105-109.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58, 1015-1026.

Fornara, F., Carrus, G., Passafaro, P., & Bonnes, M. (2011). Distinguishing the sources of normative influence on pro-environmental behaviours: the role of local norms in household waste recycling. *Group Processes and Intergroup Relations*, 14, 623-635.

Forum Ökologie und Papier & Förderverein für umweltverträgliche Papiere und Büroökologie Schweiz. (2012). Papier: Wald und Klima schützen [Paper: Saving forest and climate]. Retrieved June 29, 2013 from http://www.umweltbundesamt.de/uba-info-medien/4371.html.

Fritsche, I. (2017). "We" turn(s) the tide!: Towards a social identity approach on environmental crises. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 57-62). BfN-Script 460.

Göckeritz, S., Schultz, P. W., Rendon, T., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2010). Descriptive normative beliefs and conservation behavior: the moderating roles of personal involvement and injunctive normative beliefs. *European Journal of Social Psychology*, 40, 514-523.

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, 35, 472-482.

Nolan, J. M., Kenefick, J., & Schultz, P. W. (2011). Normative messages promoting energy conservation will be underestimated by experts … unless you show them the data. *Social Influence*, 6, 169-180.

Reese, G., Fritsche, I. & Römpke, A. (2017). Environmental Psychology – Its scientific merit and the need for future research. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 21-26). BfN-Script 460.

Reese, G., Loew, K., & Steffgen, G. (2014). A towel less: social norms enhance proenvironmental behavior in hotels. *Journal of Social Psychology*, 154, 97-100.

Römpke, A. (2017). Get in contact! Intergroup contact as a mean to foster global prosocial behavior. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 21-26). BfN-Script 460.

Schultz, P. W. (1999). Changing behavior with normative feedback interventions: a field experiment of curbside recycling. *Basic and Applied Social Psychology*, 21, 25-36.

Sloot, D., Jans, L. & Steg, L. (2017). The potential of environmental community initiatives – a social psychological perspective. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 27-34). BfN-Script 460.

Statista. (2008). Haben Sie einen Aufkleber “Bitte keine Werbung” oder einen ähnlichen am Briefkasten? [Do you have an anti-advertisement sticker or something similar at your mailbox?]. Retrieved July 29, 2013 from

http://de.statista.com/statistik/daten/studie/174021/umfrage/vorhandensein-eines-aufklebers-gegenwurfsendungen-am-briefkasten/.

Steg, L., van den Berg, A. E., & de Groot, J. I. M. (2013). *Environmental psychology: an introduction*. Oxford, UK: John Wiley & Sons.

Umweltbundesamt. (2012). Papierverbrauch und Verwertung von Altpapier [Paper consumption and utilization of recycled paper].

Wassermann, G., Schneider, F., Hingsamer, R., Steyer, F., & Zinöcker, K. (2004). Werbung auf Wunsch – Modellversuch zur Erprobung von Maßnahmen gegen die Zustellung unerwünschten Werbematerials. INITIATIVE Abfallvermeidung in Wien [Advertisement by request e model test for measures hindering the delivery of undesired advertisement. INITIATIVE waste prevention in Vienna]. Retrieved November 19, 2014 from http://www.wenigermist.at/2003-projektbericht-werbung-auf-wunsch.

3 Get in contact! Intergroup contact as a mean to foster global prosocial behavior.

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"Environmentally conscious life means to consume consciously" (Renn, 2002, p.33). But still it is very difficult for many people to adapt their consumer behavior to the needs of a livable planet (Carrington, Neville & Whitwell, 2014). Several psychological models demonstrate the manifold factors impeding behavioral changes in an environmental context: own habits, the norms in the surrounding (see also Hamann (2017) in this issue), the perceived control over changing one's own behavior, et cetera (for an overview see Steg, van den Berg & de Groot, 2013). Over and above, when people perceive threat, such as climate change, the willingness to protect the environment is again decreasing (Fritsche & Häfner, 2012); all in all a rather bleak picture for the coming decades.

But environmental destruction can be seen from different perspectives. On the one hand there is nature in danger; biodiversity and endangered species. On the other hand, the destruction of nature goes along with the destruction of the livelihood for the human species as well, so that also other people, my family and my friends are affected by my behavior. Fritsche and Häfner (2012) showed in their research, that even when confronted with existential threat, people do not lose their motivation for pro-environmental behavior to protect humans.

In this chapter, I will propose a process that might encourage people in western countries to convert their consumer behaviors into more sustainability oriented ones. Specifically, I argue that bringing people in contact with people in other countries will be a motivating factor to care more about the own influence on the wellbeing of people in other places; when it is not just the environment that is harmed, but at the same time a friend of mine.

3.1 Individuals in a global context

The role of individuals is essential for the success of a sustainable development and thereby for the fight against dangers such as climate change. On the one hand, individuals influence sustainability policies through their political decisions and voting preferences; on the other hand, it becomes more and more apparent that policy makers depend on the acceptance of their citizens. An example from the past is the introduction of a "Veggie Day" in the election campaign of the green party in Germany in 2013. It resulted in numerous protest acts like "protest barbecues" in public spaces, demonstrating that such decisions can even lead to opposite reactions when there is a lack of support in the population. Also technological solution attempts, such as the introduction of energy-saving lamps or electric cars require consumer acceptance in order to become effective. Beyond political decisions, everyone can contribute to sustainable development, for example by joining a community initiative (see Sloot, Jans & Steg (2017) in this issue) or by adjusting their individual mobility and consumer behavior.

Yet, discussing environmental problems like climate change, we talk about problems that are global in nature. That means that we have a combination of very different levels of analysis, even so they are tightly connected: A global problem with the need of individuals to act. This discrepancy can cause some problems since an individual could simply argue: „If only I ad-

just my behavior, nothing will change, so why should I? “. How could this discrepancy be addressed?

One initial step concerns humans’ ability to form and act in groups. Social Identity Theory (Tajfel & Turner, 1979) states that people can identify with different groups and tend to behave in a solidary manner towards members of such groups. This brings us from the individual level to a group leve (see also Fritsche (2017) in this issue); but still it is not global. From a global perspective, we have many different groups, for example different nationalities. But why should one be willing to act in favor of other national groups?

One well established theory dealing with the topic of intergroup relations is the so-called contact hypothesis (Allport, 1954). Several meta-analyses show in various contexts that positive contact between members of different or even competing groups can improve attitudes towards the outgroup (Pettigrew & Tropp, 2006; Pettigrew & Tropp, 2008).

Can the often replicated findings concerning contact and attitude change towards outgroups be transferred to questions of environmental friendly behavior or global responsible behavior? Thus, behavior that is helpful for all groups all over the world?

3.2 Contact and prosocial behavior

Since Gordon Allport´s (1954) formulation of the contact hypothesis, numerous studies confirmed the positive effects of intergroup contact between members of different groups (for example of different nationalities), such as reduced prejudices (for a meta-analysis see Pettigrew & Tropp, 2006; Pettigrew & Tropp, 2008), greater empathy (Batson et al. 1997) and less fear (Stephan, 2014) towards other groups.

Meta-analyses that summarize the results of all published and unpublished studies found (Pettigrew & Tropp, 2006; Pettigrew, Tropp, Wagner & Christ, 2011) suggest that the hitherto known positive effects of intergroup contact interventions occur regardless of the field of application, the age in the population studied, and regardless of origin and sex.

While these effects are promising, the link between intergroup contact and actual helping behavior between groups is still a field of very little research. Sally (2001) demonstrated in various economic games that cooperation between players increased after direct or indirect contact. People with contact to victims of various diseases or accidents showed a greater willingness of helping unknown people with the same problem (Small & Simonson, 2008). Wright and Richard (2010) reported that American students, after formation of intergroup friendships with members of foreign minorities, vetoed more against budget cuts of endowments for the benefit of the respective minority.

Still, we are interested in a broader category of prosocial behavior. When it comes to contact and prosocial behavior in a global context, for example human benefit oriented environmental friendly behavior, we have to look at a much broader outgroup than in the examples listed. As contact is able to change attitudes and feelings towards other groups, why not also towards the biggest human group thinkable; the group of all humanity?

3.3 Identification with all humanity

Within self-categorization theory (Turner, Hogg, Oakes, Reicher & Wetherell, 1987) the authors postulate different group levels, in which the self can be classified. On the one hand

there is the classical level at which the classification - for example, in a national group - is done with contrast to other (national) groups. But Turner and colleagues (1987) also define an even higher level, in which the self is set in relation to the whole of humanity. At this level, an individual sees the self as part of the international community. Analogously to this concept McFarland, Webb and Brown (2012) proposed their concept of *Identification with all humanity*, which also includes responsibility and care towards humanity. They developed a corresponding scale (Identification with All Humanity ([IWAH] - Scale) and tested it in several studies. They showed that IWAH scores predicted several attitudes relevant for environmental protection and social justice practices such as perceived importance of global affairs, the observance of human rights and the general appreciation of life. These predictions also proved to be independent of other constructs such as authoritarianism or ethnocentrism. Regarding the relationship between IWAH and prosocial behavior McFarland and his colleagues (2012) found correlations with the readiness to invest national resources for the defense of human rights as well as with donating to charity. Buchan and colleagues (2011) showed that their participants invested within a complex social dilemma game more money in a global public good, the more they identify with the world community. This effect was independent of the expectation of how much the other participants would in turn invest for the general public good. Recently Reese and colleagues could show this effect also experimentally (2015).

Still it is unclear how identification with all humanity may develop, or how it can be promoted. McFarland, Brown and Webb (2013) report that they have identified no evidence of a connection between education and values on the IWAH scale and that no existing educational programs to increase IWAH were available so far. A promising approach, how the identification with certain groups can be promoted, is depicted by Turner, Hewstone, Voci and Vonofakou (2008). They showed that people integrate other national groups partly in their own self when they observe friendships between people of their own and of another nation, suggesting the potential of international contacts in promoting transnational categories and thus sustainable practices.

3.4 Implications and advantages

Based on the reasoning above, one can derive the following model. Fostering international contacts has the potential to promote global responsible behavior such as pro-environmental behavior, by raising peoples' identification with humanity.

Intervention approaches in environmental psychology research normally aim to achieve long-term effects, for example a permanently sustainable behavior of people. Previously established approaches such as feedback systems (for example a monthly feedback on the own power consumption compared to previous months, including cost savings; Hayes & Cone, 1981) have pointed out that environmentally friendly behavior is demonstrated especially during the intervention; after the end of the intervention, it drops again (Dwyer et al., 1993).

Interventions based on personal contact may have one essential advantage over aforementioned interventions. Once initiated, especially in the form of made friendships (also email friends) the contact is able to reproduce itself without further action of teachers or researchers. If I made a friend, I am motivated to stay in touch, independent of the aims an intervention maker might have with his program. The intervention would therefore continue without

further investment of time or money in a natural way, as social relations are maintained irrespective of the environmental context.

In addition, adverse reactions to intervention programs or willful opposite behavior (reactance) may be reduced in contact interventions compared to appeal-based interventions, as no demands or the like are placed on the individual. In the case of a behavioral change, this is done out of one's own intention not to harm a friend or his group.

The Internet and online social networks allow a widely accessible way of communicating across borders, enabling people to engage in international contacts with relatively low costs (Amichai-Hamburger & McKenna, 2006). Distance does not affect this contact form; any language problem can be mitigated with appropriate online translation programs. Effort, time and monetary costs are lower than for other means of contact, status differences are less evident and participants are in their familiar surroundings during contact, preventing people from feelings of anxiety concerning the contact situation (Amichai-Hamburger & McKenna, 2006).

Furthermore it is hard to find arguments against bringing people together. Even if people do not believe in the necessity of pro-environmental behavior, the necessity of intercultural competence in a globalized word is hard to neglect.

Give it a try. Search for contact with people from other countries yourself and test if it becomes easier for you to act globally responsible. Or as an intervention maker or teacher, motivate people to engage in contact, instead of giving pure information about human caused global problems, combining fun with learning goals.

References

Allport, G. W. (1954). *The nature of prejudice.* Cambridge Mass.: Addison-Wesley Pub. Co.

Amichai-Hamburger, Y. & McKenna, K. Y. A. (2006). The contact hypothesis reconsidered: interacting via the internet. *Journal of Computer-Mediated Communication*, 11, 825–843.

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997). Is empathy-induced helping due to self–other merging?. *Journal Of Personality And Social Psychology*, 73(3), 495-509.

Carrington, M. J., Neville, B. A., & Whitwell, G. J. (2014). Lost in translation: Exploring the ethical consumer intention–behavior gap. *Journal Of Business Research*, 67(1), 2759-2767.

Dwyer, W. O., Leeming, F. C., Cobern, M. K., Porter, B., & Jackson, J. M. (1993). Critical Review of Behavioral Interventions to Preserve the Environment: Research since 1980. *Environment and Behavior, 25*(3), 275–321.

Fritsche, I. (2017). "We" turn(s) the tide!: Towards a social identity approach on environmental crises. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 57-62). BfN-Script 460.

Fritsche, I., & Häfner, K. (2012). The malicious effects of existential threat on motivation to protect the natural environment and the role of environmental identity as a moderator. *Environment and Behavior, 44*(4), 570–590.

Hamann, K. R. S. (2017). Sticker in the Box! The influence of injunctive and descriptive norms on anti-ads sticker use. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A.

Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 15-19). BfN-Script 460.

Hayes, S. C. & Cone, J. D. (1981). Reduction of residential consumption of electricity rough simple monthly feedback. *Journal of Applied Behavior Analysis*, 14, 81–88.

McFarland, S., Brown, D., & Webb, M. (2013). Identification with all humanity as a moral concept and psychological construct. *Current Directions in Psychological Science*, 22(3), 194–198.

McFarland, S., Webb, M., & Brown, D. (2012). All humanity is my ingroup: A measure and studies of identification with all humanity. *Journal Of Personality And Social Psychology*, 103(5), 830–853.

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal Of Personality And Social Psychology*, 90(5), 751–783. doi:10.1037/0022-3514.90.5.751

Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology*, 38(6), 922–934. doi:10.1002/ejsp.504

Pettigrew, T. F., Tropp, L. R., Wagner, U., & Christ, O. (2011). Recent advances in intergroup contact theory. *International Journal of Intercultural Relations*, 35(3), 271-280.

Reese, G., Proch, J., & Finn, C. (2015). Identification with all humanity: The role of self-definition and self-investment. *European Journal of Social Psychology*, 45(4), 426-440.

Renn, O. (2002). Nachhaltiger Konsum: Was kann der einzelne tun? In G. Scherhorn & C. Weber (Hrsg.), *Nachhaltiger Konsum. Auf dem Weg zur gesellschaftlichen Verankerung.* (33–39). München: ökom, Gesellschaft für ökologische Kommunikation.

Sally, D. (2001). On sympathy and games. *Journal of Economic Behavior and Organization,* 44, 1–30.

Sloot, D., Jans, L. & Steg, L. (2017). The potential of environmental community initiatives – a social psychological perspective. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 27-34). BfN-Script 460.

Small, D. A., & Simonsohn, U. (2008). Friends of victims: Personal experience and prosocial behavior. *Journal of Consumer Research*, 35(3), 532–542.

Steg, L., van den Berg, A. E., & de Groot, J. M. (2013). *Environmental psychology: An introduction.* BPS Blackwell.

Stephan, W. G. (2014). Intergroup anxiety: Theory, research, and practice. *Personality And Social Psychology Review*, 18(3), 239–255.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In S. Worchel & W. G. Austin (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks Cole.

Turner, R. N., Hewstone, M., Voci, A., & Vonofakou, C. (2008). A test of the extended intergroup contact hypothesis: The mediating role of intergroup anxiety, perceived ingroup and outgroup norms, and inclusion of the outgroup in the self. *Journal Of Personality And Social Psychology,* 95(4), 843–860.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory.* Oxford: Basil Blackwell.

Wright, S. C., & Richard, N. T. (2010). Cross-Group Helping: Perspectives on Why and Why Not. In S. Stürmer (Ed.), *The psychology of prosocial behavior. Group processes, intergroup relations, and helping* (1st ed., pp. 311–335). Chicester u.a: Wiley-Blackwell.

4 The potential of environmental community initiatives – a social psychological perspective

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Environmental community initiatives are increasingly emerging to mitigate environmental problems, for example by realising the sustainable energy transition. We aim to understand why people decide to set up or join such initiatives, and whether these initiatives are effective in promoting pro-environmental behaviour. We put forward a conceptual framework to explain the spread and effects of environmental community initiatives that suggests a dynamic interrelationship between individual and group-level factors. We propose interaction among community members as an underlying core mechanism that drives the effects of group-level factors on individual and collective pro-environmental behaviour, as well as other social activities. Preliminary empirical evidence supports our notion that both individual and group-level factors are associated with pro-environmental behaviour of members of environmental community initiatives. These insights can help practitioners to better understand and support environmental community initiatives to speed up the sustainable energy transition.

4.1 Introduction

Pressing environmental problems, such as global climate change (Rockström et al., 2009), create an increasing need to promote pro-environmental behaviour. As a response, environmental community initiatives have been emerging across many European countries and beyond. They can be characterised as a local, volunteer-driven approach to reduce environmental problems (e.g., Bailey, Hopkins, & Wilson, 2010; Middlemiss & Parrish, 2010). These community initiatives exist in a broad range of areas, with Transition Towns and renewable energy initiatives being just two examples.

Despite an increase in environmental community initiatives, there has been surprisingly little research on their potential in changing people's behaviour, and little is known about why people become involved in them in the first place. Most research on pro-environmental behaviour so far has focused on individual and household behaviour (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014). Yet, community initiatives are collective approaches, in which group-level factors could play a key role. We suggest that the group context, a key characteristic of environmental community initiatives, might affect environmental behaviours in important ways, which have hitherto not been considered. We aim to address this gap in the present research. More specifically, our research has two overall aims: understanding (a) how environmental community initiatives emerge, why some people join or start an initiative, while others do not, and (b) to what extent and why they are effective in promoting different types of pro-environmental behaviour. We propose a novel conceptual framework to explain why individuals are motivated to be involved and behave pro-environmentally in the context of environmental community initiatives that integrates individual and group-level factors.

4.2 What are environmental community initiatives?

Environmental community initiatives have three distinctive characteristics, which require a novel framework in order to understand their potential. First, as stated before, behaviour in

the context of community initiatives is different from the individual behaviour typically studied in environmental psychology. Notably, community initiatives are collective approaches: Individuals form or join a group in order to pursue a common goal. Second, environmental community initiatives are bottom-up approaches in which people aim to promote pro-environmental behaviour together. As such, they are very different from top-down approaches that aim to promote behaviour change such as environmental policies implemented by governments (e.g., subsidies for installing renewable energy technology). Community initiatives usually receive no formal institutional support, but are initiated and driven by volunteers within a given community (Hielscher, Seyfang, & Smith, 2013). This means they are both emerging in and limited to a certain local community (Middlemiss, 2011; Seyfang & Smith, 2006). Third, community initiatives are different from other forms of collective environmental behaviour, notably collective protest. The latter aims to bring about change by urging other groups (e.g. governments) to implement change to reduce environmental problems (Van Zomeren, Postmes, & Spears, 2008). In contrast, members of environmental community initiatives aim to change themselves, by changing their behaviour and the behaviour of the communities they are embedded in. As such, environmental community initiatives provide a novel context that has hardly been considered in past psychological research. We propose a new framework to better understand to what extent and how environmental community initiatives motivate pro-environmental behaviour, taking into account these three unique features.

4.3 A framework for understanding the potential of environmental community initiatives

Our framework's starting point is the proposition that both individual and group-level factors are important drivers of pro-environmental behaviour in community initiatives (Figure 2). Both factors are likely to influence each other.

Psychological research has identified various individual factors that encourage pro-environmental behaviour. Notably, it has been found that the more people value nature and the environment, and the more they see themselves as a pro-environmental person, the more they are likely to engage in pro-environmental behaviour (Steg et al., 2014; Van der Werff, Steg, & Keizer, 2013a, 2013b). This suggests that personal identity factors are important in encouraging individual pro-environmental behaviour. Personal identity answers the question: *Who am I, what do I, as an individual, want or find important?* For example, do I find it important to preserve nature and the environment or make my energy use at home more sustainable? We propose that personal identity will also encourage pro-environmental behaviour in the context of community initiatives (cf. Steg, De Groot, Dreijerink, Abrahamse, & Siero, 2011). For example, valuing the environment may encourage someone to join an environmental community initiative, and subsequently encourage initiative members to engage in pro-environmental behaviours.

We suggest, however, that a sole focus on personal identity and motivation would not do justice to the collective nature of community initiatives, which may entail important group-level processes. Notably, people derive part of their identity from the groups they belong to, such as an environmental community initiative (Tajfel & Turner, 1979; Turner, 1991 for information about the social identity approach on environmental behaviour see also Fritsche (2017) in this issue). Hence, besides personal identity, initiative identity may play an important role in encouraging pro-environmental behaviour among members. Initiative identity answers the question: *Who are we, what do we, as an initiative find important?* For example,

do we as an initiative want to contribute to a sustainable energy system? This initiative identity makes people think in group terms, in terms of '*we*'. This brings about group motivation. The stronger a person identifies with the environmental community initiative (i.e. group identification; see Postmes, Haslam, & Jans, 2013; for the influence of an identification with all humanity see also Römpke (2017) in this issue), the more members are motivated to act in line with the initiative identity.

The novelty of our framework lies in including individual as well as group-level identity to explain how and why environmental community initiatives can affect pro-environmental behaviour. We particularly focus on how the initiative identity is formed in these initiatives. Our model comprises three steps, which we will explain below: (1) the transition from individual motivation to initiative involvement, (2) the formation of initiative identity, and (3) the effects of personal and group identity on behaviour.

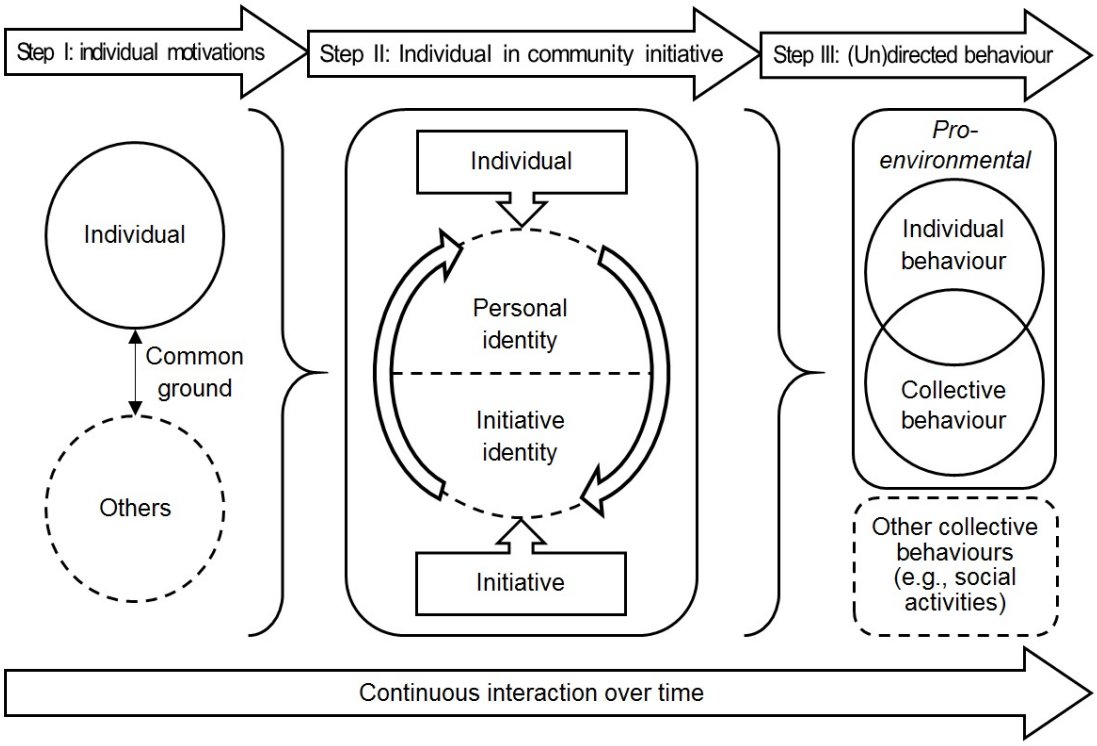

Figure 2: A proposed framework for environmental community initiatives (Sloot, Jans & Steg, unpublished)

4.3.1 From individual motivation to the community initiative (step 1)

The first step addresses the question of how an environmental community initiative emerges. We propose that the process starts with individual motivation, following from one's personal identity. For example, a person who initiates a community initiative could strongly value environmental protection, and aim to engage in behaviours to support this value. To illustrate, a person could think, *'I find it important to engage in pro-environmental energy behaviour – but I am not doing that right now'.* This person could take action by changing his or her individual behaviour related to energy use. Alternatively, through social interaction with people in the community, this person may discover that some neighbours are thinking the same way, thus

getting to the conclusion: '*Let's do this together!'*, and starting an environmental community initiative. Hence, we suggest that three key ingredients—an individual motivation, interaction with others in the community, and finding common ground (Smith, Thomas, & McGarty, 2015)—may cause the creation of an environmental community initiative. In a similar way, these three factors are likely drivers of other people joining the initiative later on. However, a strong individual motivation to behave pro-environmentally (based on one's personal identity) may not always be a necessary prerequisite for joining an environmental community initiative later on. Notably, people may not only get involved because of an individual pro-environmental motivation, but also because of other reasons, such as wanting to do things together with people in their community.

4.3.2 The formation of initiative identity (step 2)

Once people have decided to establish (or join) an environmental community initiative, initiative members start to make sense of who they are and what they want, giving rise to an initiative identity. How is this initiatives identity shaped? Recent research suggests that interaction among group members is a key driving process of shaping group identity (Jans, Leach, Garcia, & Postmes, 2014; Jans, Postmes, & Van der Zee, 2011; Postmes, Haslam, & Swaab, 2005; Postmes, Spears, Lee, & Novak, 2005). We propose that particularly in these newly emerging initiatives from the bottom up, interaction is the key process through which an initiative identity is formed. In these interactions, group members use their personal identities to influence and shape the initiative identity over time (cf. Postmes, Haslam, & Swaab, 2005). At the same time, this interaction process may influence initiative members' personal identity as well (cf. Postmes, Baray, Haslam, Morton, & Swaab, 2006). For example, they may start to personally value the environment more based on their interactions with other members in the initiative. There is some initial evidence to support this effect of interaction on group identity in the context of environmental movements: Following a short discussion and finding common ground on an environmental topic, people were more willing to engage in collective environmental behaviour than those who had not interacted with others, due to an increase in the level of identification with an environmental movement (Thomas, McGarty, & Mavor, 2016). Hence, we propose that ongoing interaction among initiative members can lead to the emergence of a shared initiative identity.

4.3.3 Community initiatives' effects on behaviour (step 3)

The successful formation of an initiative identity entails two important consequences that can motivate subsequent pro-environmental behaviour. First, initiative identity fosters cooperation among members of the initiative (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Second, the more people identify with the initiative, the more likely they are to behave in line with the content of this initiative's identity, and to pursue its goals and values (Haslam, 2004). The focus is not only on '*What do I want?'* anymore, but also on '*What do we want?'.* In sum, identification with an environmental community initiative is likely to strengthen members' motivation to pursue the initiative interests.

Empirical research has provided preliminary evidence for the effect of initiative identity on environmental behaviour. For example, when people were reminded of a group identity (e.g., their national identity) and this group was seen as relatively pro-environmental, then the group identity led to greater pro-environmental intentions (Rabinovich, Morton, & Postmes,

2012). Similarly, when people thought of certain groups they are a member of, and these groups were believed to have pro-environmental goals, participants reported greater individual pro-environmental intentions, but only for those groups they identified with (Masson & Fritsche, 2014, for more information about the role of ingroup norms see Hamann (2017) in this issue).

Importantly, as initiative members are not only motivated to behave in line with their personal identity, but also in line with the initiative identity, a broader range of behaviours may be stimulated. Notably, they are not only more likely to engage in private-sphere pro-environmental behaviours, such as saving energy in one's home by turning down the thermostat, but also in collective pro-environmental behaviour, as these help pursuing initiative goals. We define collective environmental behaviours as those that involve or affect others, such as motivating others to save energy. Furthermore, as a result of initiative identity, members may also be motivated to engage in rather different collective behaviours, such as social activities unrelated to environmental behaviour. Notably, these different types of outcomes are not mutually exclusive, but can all more or less co-occur.

To conclude, we propose that environmental community initiatives may affect individual and collective pro-environmental as well as other collective behaviour as a result of an interplay between personal and initiative identity. Through interaction, a shared initiative identity can emerge, which provides members with additional motivation to behave pro-environmentally and collectively.

4.4 Current research

In order to investigate the propositions of our conceptual framework, we devised a large-scale field study in which we follow 30 community initiatives over time. Additionally, we will follow people in communities in which an initiative is just about to emerge. All of these local initiatives belong to a network of community initiatives in the Netherlands that promotes a more sustainable energy use in households (e.g., energy saving or the adoption of renewable energy). At three points in time (each six months apart), we collect quantitative survey data among initiative takers and members of these initiatives. Additionally, we hand out surveys to members' neighbours who are not part of the initiative, in order to create an equivalent comparison group. Corresponding to our framework we measure social interaction (between members of the initiative as well as within the larger community), personal identity (e.g., the personal value put on the environment and the personal importance of energy saving), and initiative identity (e.g., the extent to which initiative members as a group find it important to save energy). Additionally, we measure the extent to which members identify with their community initiative, their intentions to engage in individual pro-environmental behaviour (e.g., saving energy, adopting renewable energies), as well as total household energy use via smart meters. Furthermore, we measure their intention to engage in collective pro-environmental behaviour, and local social activities.

An initial study, in which we tested parts of our conceptual model, provided empirical support for some of our key propositions. As expected, we found that both personal identity and initiative identity were associated with stronger intentions to engage in pro-environmental energy behaviour. Notably, these relationships were found for both individual (e.g., saving energy at home) and collective behavioural intentions (e.g., motivating others to save energy). For

collective behavioural intentions, initiative identity even had such a strong influence that personal identity hardly predicted these intentions (Sloot, Jans, & Steg, in preparation).

In sum, our first results provide initial evidence for the propositions made in our framework: both personal and group factors are associated with pro-environmental energy use in the context of environmental community initiatives. These results suggest that environmental community initiatives are a promising strategy to encourage pro-environmental behaviour, and may provide their members with additional (group) motivation to act pro-environmentally. In the next phases, we will take the temporal perspective into account: How do individual and group factors influence pro-environmental energy behaviour over time? This step is important to get a better understanding of the dynamics of how personal and initiative identity are interlinked, and to what extent they both influence each other, in turn encouraging different types of pro-environmental and collective behaviour, as our framework suggests.

To address why people join community initiatives, we will particularly focus on data collected in communities in which an initiative is just starting. As indicated above, personal identity factors may be important for the decision to join or even initiate a community initiative. Additionally, other, non-environmental factors may predict whether people join an environmental community initiative. We will test these ideas by following a comprehensive longitudinal approach to shed light on how community initiatives are formed and can spread over time.

4.5 Summary

We presented a framework to explain the spread and effectiveness of environmental community initiatives. Such initiatives seem to become increasingly important as a novel collective approach to help reduce environmental problems. We presented a conceptual framework that proposes that both individual and group factors affect the extent to which environmental community initiatives encourage individual and collective pro-environmental behaviour. Initial empirical findings support our theoretical propositions. Environmental community initiatives can make an important contribution to the sustainable energy transition due to the additional group motivation they provide, and the individual as well as collective pro-environmental outcomes they can produce. To conclude, they may help to make the transition sustainable in environmental as well as in social terms.

References

Bailey, I., Hopkins, R., & Wilson, G. (2010). Some things old, some things new: The spatial representations and politics of change of the peak oil relocalisation movement. *Geoforum*, *41*, 595–605.

Fritsche, I. (2017). “We” turn(s) the tide!: Towards a social identity approach on environmental crises. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 57-62). BfN-Script 460.

Hamann, K. R. S. (2017). Sticker in the Box! The influence of injunctive and descriptive norms on anti-ads sticker use. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p.15-19). BfN-Script 460.

Haslam, S. A. (2004). *Psychology in Organizations*. London: Sage.

Hielscher, S., Seyfang, G., & Smith, A. (2013). Grassroots innovations for sustainable energy: exploring niche development processes among community energy initiatives. In M. J. Cohen, H. S. Brown, & P. J. Vergraft (Eds.), *Innovations in Sustainable Consumption* (pp. 133–158). Cheltenham: Edward Elgar Publishing.

Jans, L., Leach, C. W., Garcia, R. L., & Postmes, T. (2014). The development of group influence on in-group identification: A multilevel approach. *Group Processes & Intergroup Relations*, *18*, 190–209.

Jans, L., Postmes, T., & Van der Zee, K. I. (2011). The induction of shared identity: the positive role of individual distinctiveness for groups. *Personality and Social Psychology Bulletin*, *37*, 1130–1141.

Masson, T., & Fritsche, I. (2014). Adherence to climate change-related ingroup norms: Do dimensions of group identification matter? *European Journal of Social Psychology*, *44*, 455–465.

Middlemiss, L. (2011). The effects of community-based action for sustainability on participants' lifestyles. *Local Environment*, *16*, 265–280.

Middlemiss, L., & Parrish, B. D. (2010). Building capacity for low-carbon communities: The role of grassroots initiatives. *Energy Policy*, *38*, 7559–7566.

Postmes, T., Baray, G., Haslam, S. A., Morton, T. a, & Swaab, R. I. (2006). The Dynamics of Personal and Social Identity Formation. In T. Postmes & J. Jetten (Eds.), *Individuality and the group: Advances in social identity* (pp. 215–236). London, Thousand Oaks, CA: Sage.

Postmes, T., Haslam, S. A., & Jans, L. (2013). A single-item measure of social identification: Reliability, validity, and utility. *British Journal of Social Psychology*, *52*, 597–617.

Postmes, T., Haslam, S. A., & Swaab, R. I. (2005). Social influence in small groups: An interactive model of social identity formation. *European Review of Social Psychology*, *16*(1), 1–42.

Postmes, T., Spears, R., Lee, A. T., & Novak, R. J. (2005). Individuality and social influence in groups: inductive and deductive routes to group identity. *Journal of Personality and Social Psychology*, *89*, 747–763.

Rabinovich, A., Morton, T., & Postmes, T. (2012). Collective self and individual choice: The effects of inter-group comparative context on environmental values and behaviour. *British Journal of Social Psychology*, *51*, 551–569.

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., Lenton, T.M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., de Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R. W., Fabry, V. J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P. & Foley, J. A. (2009). A safe operating space for humanity. *Nature*, *461*(7263), 472–475.

Römpke, A. (2017). Get in contact! Intergroup contact as a mean to foster global prosocial behavior. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 21-26). BfN-Script 460.

Seyfang, G., & Smith, A. (2006). Community action: A neglected site of innovation for sustainable development? CSERGE Working Paper EDM, No. 06-10.

Sloot, D., Jans, L., & Steg, L. (2016). Community energy initiatives as facilitators of sustainable energy behaviour. Manuscript in preparation.

Smith, L. G. E., Thomas, E. F., & McGarty, C. (2015). “We Must Be the Change We Want to See in the World”: Integrating Norms and Identities through Social Interaction. *Political Psychology*, *36*, 543–557.

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An Integrated Framework for Encouraging Pro-environmental Behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology*, *38*, 104–115.

Steg, L., De Groot, J. I. M. De, Dreijerink, L., Abrahamse, W., & Siero, F. (2011). General Antecedents of Personal Norms, Policy Acceptability, and Intentions: The Role of Values, Worldviews, and Environmental Concern. *Society and Natural Resources*, *24*, 349–367.

Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks-Cole.

Thomas, E. F., McGarty, C., & Mavor, K. (2016). Group interaction as the crucible of social identity formation: A glimpse at the foundations of social identities for collective action. *Group Processes & Intergroup Relations*, *19*, 137–151.

Turner, J. C. (1991). *Social influence*. Milton Keynes: Open University Press.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the Social Group: A Self-Categorization Theory.* Oxford: Blackwell.

Van der Werff, E., Steg, L., & Keizer, K. (2013a). It is a moral issue: The relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behaviour. *Global Environmental Change*, *23*, 1258–1265.

Van der Werff, E., Steg, L., & Keizer, K. (2013b). The value of environmental self-identity: The relationship between biospheric values, environmental self-identity and environmental preferences, intentions and behaviour. *Journal of Environmental Psychology*, *34*, 55–63.

Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin*, *134*, 504–535.

5 The trend effect: When a forecast is revised, people believe it will continue changing

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Abstract

Climate projections are inevitably surrounded by uncertainty. This uncertainty can be expressed with probabilities: “It is 60% likely that temperatures will increase by 3°C by year 2100.” With new knowledge or events, forecasts may change. How do recipients interpret such revisions? In our studies, participants were asked to predict an expert’s future forecast of various events (temperature change, sea level rise, agricultural productivity, landslide) based on two previous probability estimates, which differed from each other: the expert had become either more certain or more uncertain. A majority of participants construed the changed forecast as forming a linear trend, which they expected to see continued in the future. Thus, when probabilities had increased (e.g. 60%-70%), participants expected even higher probabilities in future forecasts. In follow-up studies, participants were shown a more variable history of three rather than two forecasts (e.g. 70%-60%-70%). This made the trend effect disappear. Results have implications for risk and climate communication, as they indicate that people judge prognoses in light of earlier estimates, and expect future prognoses to become more extreme.

5.1 Introduction: Forecasts may change with time

Imagine that you are planning a skiing trip, and are torn between two destinations: Green Mountain and Blue Mountain. In both areas, there is now a Medium risk of an avalanche. However, in Green Mountain, the risk was recently *downgraded* from High, while in Blue Mountain, it was recently *upgraded* from Low. Which area would you head for? Where do you think an avalanche is less likely to strike?

In a recent paper (Hohle & Teigen, 2015), we studied how people interpret revised forecasts and risk estimates. Results from five experiments indicated that people perceive revisions as a trend, and expect this trend to continue its up or down trajectory. Therefore, if you are like most of our research participants, you would rather go skiing in Green Mountain, presumably because you expect the avalanche risk there to keep decreasing, and judge an avalanche as less likely compared to in Blue Mountain. Although the present risks are identical in the two areas, people judge them as different based on their past levels.

The studies were conducted as part of the research project “Uncertainty communication and climate change”, in which we study how people understand uncertain information about climate change. Estimates about future climate change are inevitably drenched in uncertainty. Sources of uncertainty include the chaotic nature of the climate system, scientists’ imperfect knowledge and the large human component in shaping the future climate.

The uncertainty in climate projections and forecasts can be expressed with probabilities: “It is 60% likely that temperatures will increase by 3°C by year 2100.” Because of their uncertainty, forecasts may change. With updated information or better models, forecasts may be revised up or down or become less or more certain. Climate scientists may find that the global

average temperature is likely to increase more than they predicted 10 years ago, or that the likelihood of more wind due to climate change has increased. The aim of our studies was to explore how such revised forecasts are interpreted by lay people (for the perception of lay people regarding economic growth and sustainable city building see Drews (2017) and Bösehans (2017) in this issue).

5.2 Results: People's perception of revised forecasts

In several experiments, we gave people information about experts' revised forecasts of various events, and asked them to predict the next forecast. Research participants varied across experiments, and were either students or people from the general population, from Norway or from the US.

5.2.1 Revised probabilistic forecasts

In the first study (Hohle & Teigen, 2015, Experiment 1), participants read a text about a fictional climate scientist who had published two reports about future climate change, the first in year 2000 and the second in year 2013. Each report included an estimate of the predicted temperature and sea level rise by year 2100.

Table 1: Participants were told about an experts' two climate forecasts, and predicted the future forecast. Study 1. *N* = 62 (Source: Hohle & Teigen, 2015)

Forecast	Expert prognosis 2000	Expert prognosis 2013	Predicted prognosis 2024 *(M)*
Sea level[a]	60 cm	40 cm	36.9 cm
(quantity)	20 cm	40 cm	50.1 cm
Temperature[b]	80%	70%	62.2%
(probability)	60%	70%	75.4%

[a]Most likely sea level rise in year 2100, relative to year 2000.

[b]Probability of a temperature increase of about 3 °C by 2100, relative to year 2000.

All participants were told that the 2013 report concluded that the"global sea level in 2100 most likely will be 40 cm higher than in year 2000". For half of participants, this estimate was lower than in the 2000 report, while for the other half it was higher, suggesting increasing or decreasing estimates (see Table 1). Participants were then told that the researcher would continue to gather information and publish a new report in ten years, and were asked to estimate what "she will now consider as the most likely sea level in 2100?".

Results show that participants believed that a revised forecast would lead to further changes in the same direction. Participants who were told that the prognosis had increased from 20 to

40 cm predicted the future prognosis to be on average 50.1 cm, suggesting a further increase. Those who were told that the prognosis had decreased, from 60 to 40 cm, predicted the next prognosis to be on average 36.9 cm.

The same *trend effect* was observed for revised probabilities. In the same experiment, participants were also told about the forecaster's estimates of global temperature rise by year 2100. In the most recent report (2013), she concluded that it is 70% likely that the temperature in year 2100 will be about 3°C higher than in 2000. For half of participants, the probability had increased from a previous report, while it had increased for the other half. Again, a majority of participants extrapolated the "trend", expecting a higher probability than 70% in the increasing condition, and a lower probability in the decreasing condition (see Table 1).

Uncertainty and climate change

Because the consequences of climate change affect the average citizen, consumer, opinion maker, house owner, voter, tourist and road user, reliable communication is critical. However, communicating information about uncertain topics such as climate change, is not straightforward. While uncertainty is an inherent part of science, people prefer certainty over uncertainty (Shuckburgh, Robison, & Pidgeon, 2012), and receivers may interpret uncertain information about climate change differently from what the expert intended (Budescu, Broomell, & Por, 2009; Budescu, Por, Broomell, & Smithson, 2014). In the case of climate change, uncertainty is often used strategically to oppose climate action (Moser, 2010), and individuals interpret uncertain climate information differently based on their personal ideology and belief in climate change (Budescu, Por, & Broomell, 2012). The aim of our project is to look into some of these topics, and contribute to a better understanding of how a lay audience can be expected to interpret different uncertainty expressions.

Figure 3: Infobox regarding uncertainty and climate change

Thus, although the forecaster's most recent estimates were identical for all participants, participants' guesses for the future prognosis varied based on the expert's original prognosis. The change from one forecast to another seems sufficient for participants to perceive a trend that they believe will continue in future revisions. If a projected quantity has moved upwards, it is expected to increase further, and if a prediction has become more certain, is it believed to become even more certain.

The trend effect was replicated in three more experiments (Hohle & Teigen, 2015), varying forecast topics (agricultural productivity, landslide risks) and forecasters (computer models versus a human judge). Across all studies, very few participants (2-22%) chose to discount the first forecast and keep the most recent one as the best guess for the future.

Interestingly, personal beliefs also affected expectations. The general tendency across studies was that a high belief in climate change was associated with expecting a forecast indicating more climate change in the future, and thus more willingness to follow trends compatible with more climate change. This result is in line with research suggesting that judgments of climate risks are affected by individual values and beliefs (Austgulen & Stø, 2013; Kahan, Braman, Gastil, Slovic & Mertz, 2007; McCright & Dunlap, 2011), and that interpretation of uncertain information about climate change varies with attitudes to climate change (Budescu, Por, & Broomell, 2012).

Importantly, revisions seem to affect not only beliefs about the future forecast, but also evaluations of the expert. In an unpublished follow-up study, we found that an expert revising the probability of some future event downwards was perceived as more uncertain than an expert revising it upwards, although their most recent probability estimate was equal.

5.2.2 Revised categorical risks

Risks are often expressed categorically, for instance with color codes. For instance, Norwegians can find the risks of avalanche, earth slide and flooding across the country at the internet site varsom.no, and may observe the avalanche risk in Tromsø being revised upwards from yellow (moderate risk) to orange (considerable risk) from one day to the next. The aim of one study (Hohle & Teigen, 2015, Experiment 3) was to explore how people would interpret revisions of such categorical prognoses. Will changing colors also be interpreted as a trend? Participants were told about the landslide risk in three fictitious mountain areas. The present risk was Yellow (medium) for all areas, but the risk assessed two weeks ago varied. It had either increased from Green (low), decreased from Red (high), or remained stable at Yellow. Participants were asked in which area they expected inhabitants to be the most and the least worried.

Taking into account only the most recent risk assessment, each mountain would have been rated as most worrisome by about 33% of the participants. However, most participants (61%) thought that people living in the mountain area where the risk had *increased*, would be the most worried, supporting the trend effect. The place with the downgraded risk was expected to cause the least worry. This suggest that people make use of the past risk assessment to judge the present risk. Moreover, they use a trend strategy. This is remarkable, as another way of using past information would be to think that the change from Red to Yellow would give more reason for concern. After all, this risk used to be high, and the area therefore has a grimmer “track record” than the others. Yet, seeing the revision as a trend seems to be preferred by most participants.

5.2.3 Additional information can reduce the trend effect

A recent follow-up study has shown that if people were given three rather than two forecasts, the trend effect was disrupted. When the probability of some future event varied between three reports (e.g. 60%-70%-60%), there was no longer a preference for expecting the change from T_2 to T_3 to continue. Although a majority of participants seemed to agree that the next future probability would be different from the recent one, they did not agree on the direction of change (Hohle & Teigen, unpublished data).

Thus, we observe that people faced with a forecast that has been revised once expect the future forecast to be even more extreme than the most recent one. Yet, this effect is disrupted when they learn about an earlier forecast signaling a more variable history of revisions.

Finally, we tested whether additional information would reduce the tendency to extrapolate the most recent trend also for time series data. In this experiment (Hohle & Teigen, unpublished data), 135 participants were presented with real data about Norwegian grouse hunt. They were shown a graph indicating the number of grouses hunted yearly in Norway over the past years. Half of the participants were shown data from the past three years, which indicated a clear increasing trend. The other half saw data from the past ten years, for

which a trend was less evident (see Figure 4). Participants were then asked to predict the number of grouses that would be killed in the upcoming year. As predicted, participants expected a higher number after seeing the short (on average 220 000 grouses) compared to the long time series (177 000 grouses). Frequency data shows the difference even clearer. When participants had only seen information from the past three years, 51% of them expected next year's grouse hunt to increase even further. However, when participants also saw data from further back in time, only 19% expected an increase.

The present results illustrate how selection of data can alter receivers' judgments. People seem to make use of all the information they are given. Additional information about preceding values made them less sensitive to recent changes and more conservative regarding their expectations about the future.

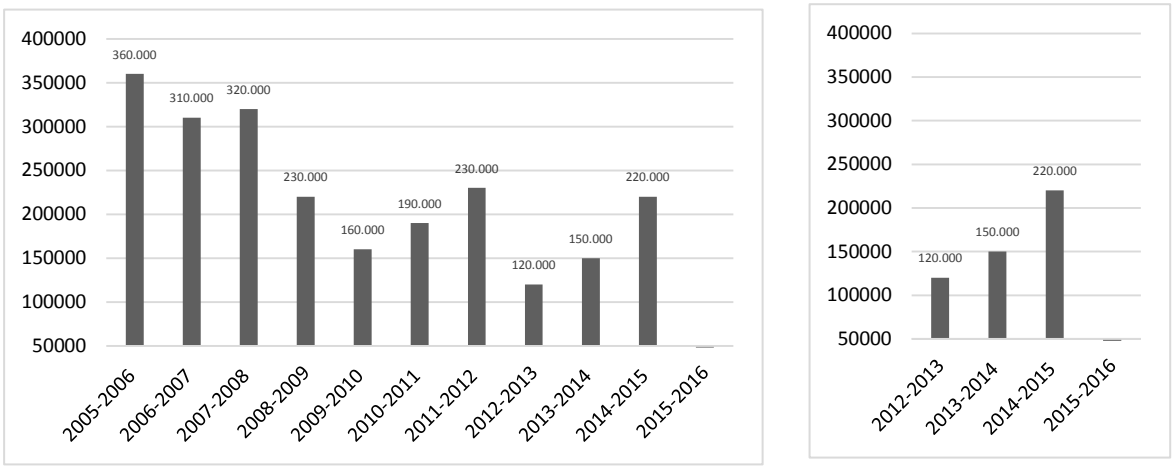

Figure 4: Information about past grouse hunt shown to participants in the Long condition (left) and Short condition (right). Bars indicate the number of grouses being killed in Norway in previous hunting seasons. Participants were asked to predict the number of grouses being killed in the 2015-2016 season (Hohle & Teigen, unpublished)

5.3 Implications for communication of forecasts

Our studies indicate that forecast receivers interpret forecasts in light of previous estimates. An expert's revision of a forecast is understood as a trend, and this trend is believed to continue in future revisions – especially if the trend matches the receiver's own beliefs. This trend effect leads receivers to expect future forecasts to be more extreme than present forecasts. Furthermore, revisions affect how the expert is evaluated. A forecaster is seen as more uncertain when she has revised the probability of a future outcome downwards compared to upwards.

It would be natural to assume that a forecaster has included all information there is at present into her most recent forecast. By expecting a future forecast that is more extreme than ever before, participants paradoxically assume to know more about the future than the forecaster does.

These results have implications for communication of forecasts and risks. Receivers of a revised forecast may interpret it in light of previous prognoses and incorporate an expectation of further revisions into their evaluations. Thus, an earthquake risk that is upgraded from

low to medium may appear more threatening than one that is downgraded from high to medium.

Revisions of uncertain estimates may affect the choices people make based on these estimates. Maglio and Polman (2016) found that people would rather choose a product for which the estimated chance of effectiveness had increased rather than one whose effectiveness had decreased. Moreover, when told that the chance of an environmental risk occurring had increased, participants were willing to pay more for a product that reduced this problem, compared to when the probability had decreased. As in our studies, past probability was always equal across conditions. Future studies could therefore test whether revisions of forecasts will affect people's actual behavior, and whether people for instance will be more willing to take action to mitigate climate change when informed about an increasing probability for some negative future event.

Our last results suggest that the amount of information presented to people shapes beliefs about the future outcome. Even as little as two data points may be interpreted as a trend that is believed to continue. Only when a "trend" is shown to be preceded by values that disrupt the trend, do less people believe the last "trend" will continue." Communicators should therefore be cautious when selecting how much data to present. Presenting a limited dataset may lead the audience to infer trends that are not supported by a more complete dataset.

References

Austgulen, M. H., & Stø, E. (2013). Norsk skepsis og usikkerhet om klimaendringer [Norwegian scepticism and uncertainty about climate changes]. *Tidsskrift for samfunnsforskning, 54*(02), 124–149.

Bösehans, G. (2017). Let's build a city: Exploring peoples' conceptions of urban design. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), Outlooks on Applying Environmental Psychology Research (p. 49-55). BfN-Script 460.

Budescu, D. V., Broomell, S., & Por, H.-H. (2009). Improving communication of uncertainty in the reports of the Intergovernmental Panel on Climate Change. *Psychological Science, 20*(3), 299-308.

Budescu, D. V., Por, H.-H., & Broomell, S. B. (2012). Effective communication of uncertainty in the IPCC reports. *Climatic change, 113*(2), 181–200.

Budescu, D. V., Por, H.-H., Broomell, S. B., & Smithson, M. (2014). The interpretation of IPCC probabilistic statements around the world. *Nature Climate Change*, 4(6), 508-512.

Drews, S. (2017). Public views on economic growth and the environment. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), Outlooks on Applying Environmental Psychology Research (p. 43-48). BfN-Script 460.

Gilovich, T., Vallone, R., & Tversky, A. (1985). The hot hand in basket- ball: On the misperception of random sequences. *Cognitive Psychology, 17,* 295–314. http://dx.doi.org/10.1016/0010-0285(85)90010-6

Hohle, S. M., & Teigen, K. H. (2015). Forecasting forecasts: The trend effect. *Judgment and Decision Making*, *10*(5), 416.

Kahan, D. M., Braman, D., Gastil, J., Slovic, P., & Mertz, C. (2007). Culture and identity-protective cognition: Explaining the white-male effect in risk perception. *Journal of Empirical Legal Studies, 4*(3), 465–505.

Maglio, S. J., & Polman, E. (2016). Revising Probability Estimates: Why Increasing Likelihood Means Increasing Impact. *Journal of personality and social psychology*.

McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly, 52*(2), 155–194.

Moser, S. C. (2010). Communicating climate change: history, challenges, process and future directions. *Wiley Interdisciplinary Reviews: Climate Change*, 1(1), 31-53.

Shuckburgh, E., Robison, R., & Pidgeon, N. (2012). Climate science, the public and the news media. *Summary findings of a survey and focus groups* conducted in the UK in March 2011.

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6 Public views on economic growth and the environment

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There is long-standing academic and public debate on the relationship between economic growth and environmental sustainability. It goes back to the well-known “Limits to Growth” report in the 1970’s for the Club of Rome (Meadows et al. 1974). In recent years, this debate has received new impetus, perhaps most notably through the publication of “Prosperity without Growth” by Tim Jackson (2011). A main reason for the renewed debate is the unprecedented challenge posed by climate change. To achieve a stabilization of global warming below 2°C (or even 1.5°C) until 2100, the global economy has to decouple CO2 emissions at a considerably faster rate than observed during the past decades (e.g. Victor, 2010; Antal & van den Bergh, 2014). Economic growth is not only questioned on the basis of environmental problems but also social-psychological considerations. There is evidence that economic growth does no longer contribute to improving life satisfaction or other proxies of social welfare in rich countries (e.g., Easterlin et al., 2010).

Many issues of this debate have received considerable attention in the media. For example, Paul Krugman, public intellectual and Nobel prize winner in Economics, has twice already devoted attention to questions of growth and the environment in his NYT column (New York Times, 2014a/b; to see more examples of media coverage, the media library on www.degrowth.de is a good place to start). Overall, it is fair to suggest that economic growth and its relationship to the environment and prosperity is an increasingly important public issue. If perpetual economic growth is indeed environmentally unsustainable, then it seems reasonable to study public attitudes towards the dominant growth paradigm, and seek public support for strategies that go beyond it. However, public opinion is an element that is surprisingly missing in the newly emerging research that questions the growth paradigm.

Here I report on some the main findings of a study that I co-authored and recently published in Global Environmental Change (Drews & van den Bergh, 2016). Its main aims were to assess a broad range of public views related to the economic growth debate, as well as to examine how views are associated to certain individual characteristics.

6.1 Previous research of attitudes towards economic growth and the environment

There is a great deal of empirical research on environmental attitudes, but these studies are often carried out without considering the wider socioeconomic context (Uzzell & Räthzel, 2009; Gifford, 2014; Capstick et al., 2015), let alone specific questions relating to economic growth. Compared to the large literature on environmental attitudes in general, there are very few studies that have tried to assess public attitudes towards the relationship between economic growth, environmental issues, and prosperity (for public attitudes towards sustainable city planning and lay peoples´ perception of uncertain climate change forecasts see Bösehans (2017) and Hohle & Teigen (2017) in this issue). Shortly after the rise of the academic debate on economic growth and the environment in the 1970s, questions on this issue were included in some opinion polls such as Gallup in the US or the World Values Survey (WVS). For instance, the WVS asks respondents to choose between the two statements: (a)

“Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs.”, or (b) “Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.” However, this question wording and format may be considered problematic: First of all, the adopted dichotomous choice is misleading, because one can think of a more diverse set of response options (van den Bergh and Kallis, 2012), as will be shown later. It is also unclear what is meant, or what people understand, by “curbing” or “slower” economic growth. Both terms suggest that growth, even though (s)lower, can continue and should go together with environmental protection.

Kaplowitz et al. (2013) go beyond the typical dichotomous choice question format and offered a third option: namely, an equal prioritization of economic growth and environmental sustainability. They found that the majority of US respondents opted for this middle option. But also this study remains somewhat limited, as it otherwise adopts the same response options and wording as in the WVS. Taken together, previous research has not offered a very complete and balanced study of public views about economic growth and the environment. Therefore, it was considered useful and timely to investigate public attitudes and beliefs in a more comprehensive way, which is what we set out to do in the present study.

6.2 The survey method

The questionnaire included more than 40 questions eliciting attitudes, beliefs and knowledge related to economic growth. Questions on environmental as well as non-environmental aspects of growth were covered. For example, we asked people whether they agree or disagree to the proposition that economic growth is essential to improve people’s life satisfaction. It is important to note that all questions referred generally to economic growth in “rich, industrialized countries” and to “global environmental problems (e.g. biodiversity loss, climate change)”, if not stated otherwise.

To examine individual-level variation in public views on economic growth and the environment, we focused on three sets of explanatory variables: (i) knowledge about the economy and the environment; (ii) ideology and personal values; and (iii) socio-demographic variables. In addition, two variables were used to control for possible influences of the economic crisis in Spain.

The survey was implemented in July 2014 through an online-based questionnaire. It had 1,008 respondents and was nationally representative in terms of key socio-demographic variables.

6.3 Results in a nutshell

Main findings of the study were obtained from a factor analysis of 22 Likert statements with a 7-point response scale. All statements captured different aspects of the economic growth debate and referred generally to “rich, industrialized countries” (i.e. not specifically to Spain). Instead of analyzing responses to individual statements, we intended to reduce the data to interpretable factors, that is, dimensions in the structure of attitudes. In other words, those statements were identified to which respondents answered in a consistent and related way. Overall, we found 6 factors in the aforementioned 22 statements, which I will briefly describe as follows.

The first factor is called *Prosperity with growth* and consists of eight statements. The statements most strongly related to this factor generally convey beliefs that economic growth delivers, or is even a prerequisite for, jobs, happiness, public services, and economic stability. One statement captures the belief that growth is necessary for environmental protection, yet only 51% agree with this. In sum, people scoring high on this factor believe that growth is important and necessary to assure prosperity. Of course, it is worth keeping in mind that those who respond to the statements in a negative way can be considered as the people endorsing a view of prosperity *without* growth.

The second factor was labeled *Environmental limits to growth.* Respondents scoring high on this factor see environmental and resource limits to growth. Two statements related to a possible end of economic growth due to climate change or the limited availability of natural resources. Two additional statements expressed the belief in the negative effects of continued economic growth on net energy conservation and the environment in general. The statement that was related most weakly to this factor asserts that rich countries may have to give up their economic growth so that poorer countries have enough environmental and resource space to develop.

The third factor – *general optimism* – includes three rather distinct statements which all reflect some type of optimism: a techno-fix optimism regarding solutions to the environmental problems associated with growth; optimism that growth will positively affect people's concern and care for the environment; and optimism about growth recovering at previous rates in the future. Overall, this optimism is shared by somewhat less than one-third of the respondents.

The fourth factor is named *wrong priority*. The three statements reflect that economic growth is given too much societal importance. This is expressed by two statements saying that both media and politicians give too much attention to economic growth. An alternative priority is reducing income inequality, which a large majority (76%) sees as more important than pursuing economic growth.

The fifth factor is called *overrated GDP*. It consists of two statements which both capture the idea that the measure of economic growth (the Gross Domestic Product) is an inappropriate indicator of social welfare. The sixth factor – *governmental control* – is a single statement which relates to the question of whether or not economic growth can be controlled by the government.

We then asked some more concrete and relevant single questions related to economic growth. Perhaps most interestingly, we investigated public views specifically regarding the growth-environment relationship by using a novel measure that offered four options. Results are shown in the blue bars of Figure 5. The majority of the respondents favored continuing with growth, as it can be combined with environmental sustainability (*green growth*). About one-third supported either ignoring growth as a policy aim (*agrowth*) or stopping it altogether (*degrowth*). Very few wanted growth unconditionally (*growth-at-all-costs*). Note that the specific labels of each position were not used in the questionnaire itself.

A related question asked respondents which GDP growth rate the governments of rich countries should aim far. Responses to this question were crossed with the previous question on the growth-environment relationship. This shows that almost all respondents favored positive

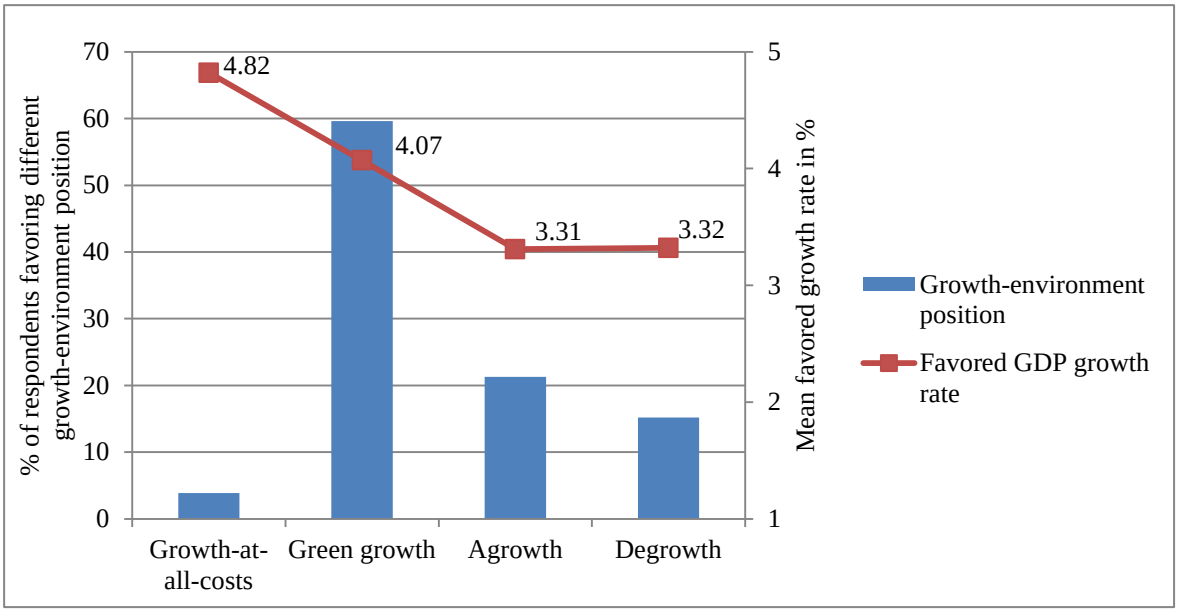

Figure 5: Preferred economic growth-environment position (blue bars) and favored GDP growth rate (red markers). (Source: Drews and van den Bergh, 2016)

and relative high growth rates, including those who supported degrowth (i.e. stopping economic growth). This may reflect some attitudinal inconsistency.

Associating these views with the earlier identified factors and attitudes yielded largely consistent results: both agrowth and degrowth supporters believe less in the idea of *prosperity with growth*. A notable difference between the two positions was that agrowth support is more strongly linked to the idea that growth is a *wrong priority*, while degrowth supporters expressed slightly more agreement with the *environmental limits to growth*.

Another relevant issue of the growth debate is whether endless economic growth is possible or not. We asked our respondents when they think economic growth in rich industrialized countries may come to end. Public beliefs ranged from very pessimistic to very optimistic. A considerable number of people (44%) believed that economic growth may stop within the next 25 years. At the other extreme almost 30% of respondents believed it may be never-ending. The remaining respondents fell somewhere in the middle of these two answers. We then asked people to indicate reasons to justify their beliefs. Socioeconomic reasons (e.g. inequality) were somewhat more important than environmental ones (e.g. energy scarcity) to justify beliefs in an end of growth. Strong confidence in technology and human ingenuity were the main reasons indicated by those believing in never-ending growth.

With regard to individual characteristics, a noteworthy result is that conservation values (e.g. “tradition”, “security”) played an important, if not *the* most important, role in explaining support for various pro-growth views. In addition, people who were more religious and politically right-of-centre had more positive views about economic growth. Taken together, these findings may be in line with system-justification theory (Jost et al., 2008). This suggests that people are (often unconsciously) motivated to bolster, defend, and justify the status quo – that is, the prevailing social, economic, and political systems. Economic growth is undoubtedly an essential part of this broader system.

6.4 Implications for practice and policy

Compared to previous research, the general value of this study is that it provides a more nuanced picture of public opinion on the relationships between economic growth, the environment and prosperity. Several implications emerge from this work. First, those that aim to communicate about growth and environment should be aware of the various facets in the debate, and that people may respond differently to each of these. The basic message of the study is that people's attitudes are characterized by more than just pro-or anti-growth sentiment.

Second, the study findings may be interesting for all those who – for environmental or other considerations – propose and communicate a shift away from the growth paradigm. With this goal of change in mind, one may find grounds for both hope and despair when looking at the study results. The most widespread belief about economic growth seems to be that it is needed to create jobs. Finding solutions for unemployment independent of growth seems a worthwhile goal. While this is difficult, examples like Japan show that jobs can be maintained even in a scenario of basically zero growth. Furthermore, given that the majority of people believe anyway that growth may come to an end, one could highlight this point as a motivation to build alternative strategies.

Third, the high prevalence of attitudes reflecting certain types of growth-criticism suggests a fertile ground to raise these issues in the political debate. This relates to the fact that at the moment no major political party dares to question the growth paradigm. The results of this study, but also data from other recent research such as a nationally representative survey on environmental consciousness in Germany (UBA, 2015), show that questioning growth may resonate with considerable segments of the population.

Finally, it would be worthwhile for practitioners to reflect on the effect of labels in the growth debate. In particular, many activists and scholars have embraced the term "degrowth" to communicate opposition to the growth paradigm. As I have argued at another place (Drews & Antal, 2016), this negative term might be an unfortunate name for a movement.

References

Antal, M., van den Bergh, J.C.J.M. (2014). Green growth and climate change: conceptual and empirical considerations. *Climate Policy* 1–13. doi:10.1080/14693062.2014.992003

Bösehans, G. (2017). Let's build a city: Exploring peoples' conceptions of urban design. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 49-55). BfN-Script 460.

Capstick, S., Lorenzoni, I., Corner, A., Whitmarsh, L. (2015). Prospects for radical emissions reduction through behavior and lifestyle change. *Carbon Management* 0, 1–17. doi:10.1080/17583004.2015.1020011

Drews, S., van den Bergh, J.C.J.M. (2016). Public views on economic growth, the environment and prosperity: Results of a questionnaire survey. *Global Environmental Change* 39, 1–14.

Drews, S., Antal, M. (2016). Degrowth: A "missile word" that backfires? *Ecological Economics* 126, 182–187. doi:10.1016/j.ecolecon.2016.04.001

Easterlin, R.A., McVey, L.A., Switek, M., Sawangfa, O., Zweig, J.S. (2010). The happiness-income paradox revisited. *Proceedings of the National Academy of Sciences* 107, 22463–22468. doi:10.1073/pnas.1015962107

Hohle, S. M. & Teigen, K. H. (2017). The trend effect: When a forecast is revised, people believe it will continue changing. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 35-41). BfN-Script 460.

Jackson, T. (2011). Prosperity Without Growth: Economics for a Finite Planet. Routledge.

Jost, J.T., Ledgerwood, A., Hardin, C.D. (2008). Shared Reality, System Justification, and the Relational Basis of Ideological Beliefs. *Social and Personality Psychology Compass* 2, 171–186. doi:10.1111/j.1751-9004.2007.00056.x

Kaplowitz, M.D., Lupi, F., Yeboah, F.K., Thorp, L.G. (2013). Exploring the middle ground between environmental protection and economic growth. *Public Understanding of Science* 22, 413–426. doi:10.1177/0963662511424545

Meadows, D.H., Meadows, D.L., Randers, J., Behrens, W.W. (1972). The Limits to Growth: A Report for the Club of Rome's Proyect on the Predicament of Mankind. Universe Books, New York.

Uzzell, D., Räthzel, N. (2009). Transforming environmental psychology. *Journal of. Environmental. Psychology* 29, 340–350. doi:10.1016/j.jenvp.2008.11.005

van den Bergh, J.C.J.M., Kallis, G. (2012). Growth, A-Growth or Degrowth to Stay within planetary Boundaries? *Journal of Economic Issues*, 46 (4), 909-920.

Victor, P. (2010). Questioning economic growth. *Nature* 468, 370–371. doi:10.1038/468370a

UBA, 2015. *Umweltbewußtsein in Deutschland 2014.* German Federal Environmental Agency.

7 Let's build a city: Exploring peoples' conceptions of urban design

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Developing a universal blue print for a sustainable city may be close to impossible, as cities differ in their basic characteristics including geographical region and climate, cultural history and wealth (Gardner, 2016). Visions of future (sustainable) cities are often created by the collaboration of a handful of interdisciplinary research teams of leading academics (e.g. London 2062; Bell & Paskins, 2013), rather than by the thousands or millions of people whose lives will be affected. This is in times where stakeholder engagement and involving the civil society in social innovation processes have been shown to be critical for imagining and moving toward future sustainable lifestyles (Mont, Neuvonen & Lähteenoja, 2014). It thus comes as no surprise that, to date, little to no research has investigated how ordinary people, who do not possess any relevant knowledge of (sustainable) urban design and planning, conceive of a sustainable city and how this compares with more formal definitions by recognised experts in the field – here, the seven core aspects of a sustainable city outlined by Jabareen (2006). Exploring lay peoples' conception of sustainable urban design is important because it may allow for the identification of commonly held misperceptions regarding people's understanding of (sustainable) urban form, which might aid urban planners and decision makers to better consider peoples' needs, to communicate their plans more effectively and to make the urban design process more transparent and participatory in the future (for lay peoples´ perception of economic growth and uncertain climate change forecasts see Drews (2017) and Hohle & Teigen (2017) in this manual). Eliciting peoples' perceptions in a meaningful context may be challenging, however. Questionnaires and interviews or focus groups may produce meaningful data, yet they may also lack the capacity for participants to express themselves creatively. In the current study, this issue was overcome by having participants play the iconic urban simulation game Sim City (Sim City 4) in a laboratory experiment. The game Sim City enables the player to assume the role of an urban planner and to design cities from scratch.

Certainly, the game does not possess the realism and richness of operational (microsimulation) models, such as UrbanSim (Waddell, 2002), which is intended as a quantitative tool for real world policy evaluation involving complex interactions of transportation, land use and environmental outcomes (e.g. Bierlaire, De Palma, Hurtubia & Waddell, 2015; Borning, Waddell & Förster, 2008; De Palma, Picard & Motamedi, 2014; Felsenstein, Axhausen & Waddell, 2010). Instead, the aim of the current study was to elicit peoples' conception of sustainable urban design with an easily accessible and easy-to-learn simulation that involved a playful component: Sim City. To elicit participants' conceptions, they were asked to verbalise their thought processes while creating their cities, thus creating a Think Aloud (TA) protocol. The great advantage of this method lies in its capacity to accumulate rich verbal data about the participants' thought processes during a complex problem solving task. By analysing this data, researchers can extract which bits of information are focused on during solving the task and how that information has aided the participant in finding a solution to the task at hand. That is, "inferences can be made about the reasoning processes that were used during the problem-solving task" (Fonteyn, Kuipers & Grobe, 1993, p. 430). This, in turn, enabled to reveal peoples' awareness of their built environments, what sustainable urban design aspects they considered and which aspects they deliberately or inadvertently attributed more or less importance to.

7.1 Method

Participants

Twenty-five university-based participants were recruited to take part in the study and were awarded £5 upon completion of the experiment. All participants provided written consent prior to taking part in the study which received full ethical approval by the Psychology Ethics Committee (ref. 15-190).

Materials and measures

The simulation

Participants played the urban planning/city simulation game Sim City 4 Deluxe Edition (developed by Maxis and published by Electronic Arts in 2003) on a BRAND laptop with Windows VERSION OS. On a transformable grid-like surface, the game allows the player to create a city according to his or her imagination. Players can develop their cities by drawing on a mix of low to high density commercial, residential, or industrial zones. The player needs to supply power and water facilities (the water requirement was deleted as this was not important for the research question) to the city's residents before he or she can devote attention to public services (e.g. health, education and safety), transport (e.g. street connectivity and public transport provision) and the environment (e.g. parks and landmarks). Several performance bars indicate the city's status on various factors including the environment, traffic or safety, reacting quickly to the player's in-game choices. While developing the city, the player also must ensure to keep his budget balanced. For the present study, the 'easy' mode was selected, providing participants with 500,000 units of in-game currency to spend. The game also offers further, very detailed, monitoring options (e.g. traffic flow view, air pollution heat map) and governing choices (e.g. adjusting taxes, specific programs or trade agreements) that were, however, not intended for participant's use in the limited amount of time provided.

Urban design factors

In the present study, attention was paid to whether participants addressed the list of the following urban design factors (based on Jabareen, 2006):

- City compactness. Participants could choose to either place zones adjacent to each other and thus creating a compact city, or to increase the distance between zones and create a loosely connected city, as being determined by the number of grid units/tiles between zones.

- Density. The game offers players the choice between three layers of density for commercial, industrial and residential zones (i.e. small, medium and high density) that can be mixed at will. Lower density development included mostly single houses (residential), small shops (commercial) and agriculture (industrial), whereas higher density developments comprised dense high rises (residential), tall office buildings and heavy industry (industrial).

- Diversity. Although being difficult to address directly in the game, participants could combine different layers of residential, commercial and industrial zones (i.e. low, medium and

high), thus enabling them to create a diversity of different housing types and work places. In addition, participants had the option to integrate a number of attractions and recreational areas for their residents.

- Mixed land use. Participants were free to either build segregated chunks of different zoning types (i.e. residential, commercial or industrial) or to mix them, the latter option of which indicated mixed land use.

- Sustainable energy. Among the options available to participants were either polluting coal, oil, gas or waste-to-energy plants or sustainable wind energy, whereas more advanced options including solar and nuclear only became available to participants at a certain population size and wealth.

- Sustainable transport. Sustainable transport options that participants could implement included various forms of public transport (e.g. buses, trains or underground), although there were no separate options for cycling facilities. Other than that, participants could build a variety of street types (e.g. calm neighbourhood scale streets, roads, avenues or highways), toll booths and one of three airport types (small landing strip, medium local or international airport).

- Greenery. A variety of green parks, plazas and recreational areas (e.g. basketball courts, football pitches or playgrounds) were at participants' disposal. Moreover, participants were able to plant trees manually and to transform the environment though terraforming (i.e. changing the physical structure of the environment by raising, lowering or flattening the terrain) creating new rivers or mountains, for instance.

A MAKE voice recorder was used to record participants' thought processes while playing the game via a think-aloud protocol. Whether participants paid attention to Jabareen's (2006) list of seven factors, was assessed primarily through analysis of these think-aloud protocols and was complemented by having participants rate the importance of the factors (Likert scale from 1 – Not important at all to 7 – Very important) in a short survey that was administered after the main task (i.e. building the cities) of the experiment. As part of this survey, participants were also asked to indicate their experience with playing videogames on a scale from 1 – Never to 7 – Daily to distinguish casual or frequent gamers from non-gamers. However, video game experience was not found to have a visible impact on the results. Finally, in-game data on various population, environment and transport-related data were collected (see Table 2).

Table 2: In-game data variables for population, environment and transport.

Population	Environment	Transport
Cash balance	Air pollution	Commute time
Mayor rating	Water pollution	Bus use
Population size	Garbage capacity	Car use
Life expectancy	Garbage usage	Pedestrians
Average Income	Power capacity	Subway use
Jobs commercial	Power usage	Train use
Jobs industrial		Freight train use
Crime rate		Freight truck use
Education		

7.2 Procedure

After having been given information about the study and having given their informed consent, participants played through a 20-minute tutorial to familiarise them with the features of the game. After having completed the tutorial, participants were randomly allocated to create both the most and the least sustainable city they can imagine, in a counter-balanced order; that is, 13 (12) participants were asked to create the most (least) sustainable city first. Participants were given a time limit of 30 minutes for the creation of each of the two cities or until their funds ran out, at which point their creation was saved. In the process, participant's thought process was audio-recorded with the experimenter sitting next to the participant and prompting verbal feedback/discussion or providing help, if necessary. After completion of the simulation task, participants were asked to fill in the short survey outlined in the Materials section. The procedure is illustrated in Figure 6.

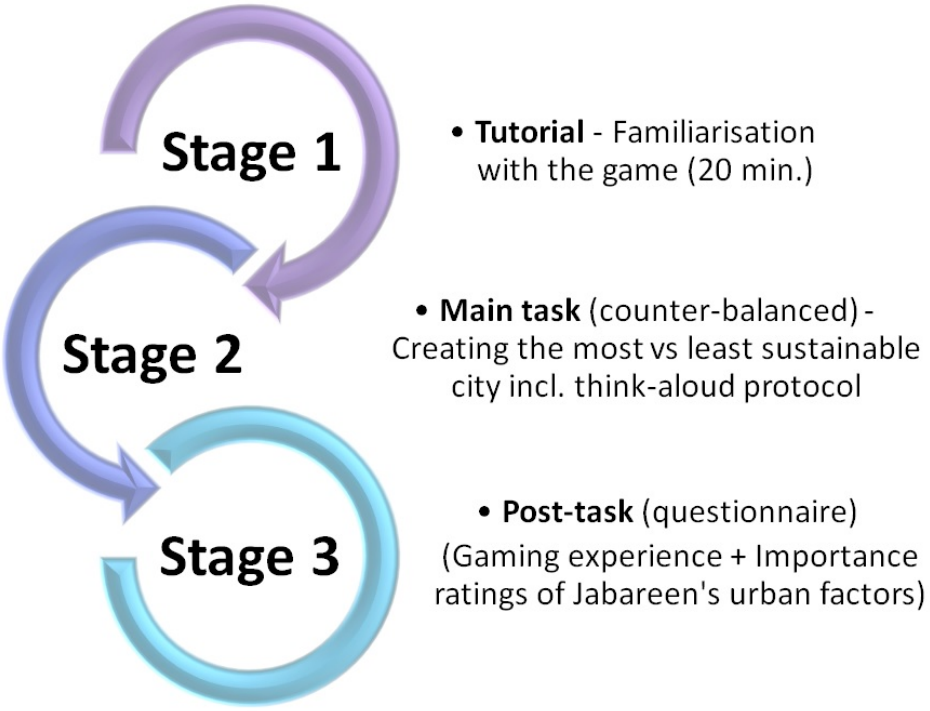

Figure 6: Task procedure

7.3 Results and Discussion

Overall, the results of the qualitative data analysis and the inspection of the created cities (an example is shown in Figure 7) suggested that there was a certain degree of consensus about how a sustainable city should look like. In most cases, participants seemed to be aware of Jabareen's (2006) urban design aspects, although there was a decreasing degree of awareness from more obvious sustainable urban design features (i.e. sustainable transport, energy and greening) to less obvious urban features including density and compactness and, in particular, diversity and mixed land use. A possible explanation for this gap could be the differing degrees of attention devoted to each aspect in both academia and the media. Debates surrounding energy and transport, for instance, are always on the research agenda (Devine-Wright, 2011; Xenias & Whitmarsh, 2013), as the public is often directly affected and thus involved in these debates. The think-aloud protocols enabled the identification of further factors that do not appear on Jabareen's (2006) list, such as the role of self-sufficiency and education. In sum, the experiment has proven invaluable in giving participants the opportunity to illustrate their very own version of a sustainable city. We did not expect participants to create the perfect (un-)sustainable city, nor did we consider any city a failed attempt, despite a huge variability in outcomes. Future direct or conceptual replications would benefit from using newer versions of the game, giving participants even more options to customize their cities, thereby informing the urban planning process.

Figure 7: Example of an unsustainable city created during the experimental task (Screenshot: Gustav Bösehans; Sim City 4 Deluxe Edition)

References

Bell, S., & Paskins, J. (2013). *Imagining the Future City: London 2062*. London: Ubiquity Press.

Bierlaire, M., De Palma, A., Hurtubia, R., & Waddell, P. (2015). *Integrated transport and land use modeling for sustainable cities* (No. EPFL-BOOK-207449). EPFL Press, Lausanne.

Borning, A., Waddell, P., & Förster, R. (2008). UrbanSim: Using simulation to inform public deliberation and decision-making. *Digital Government, 17,* 439-464.

De Palma, A., Picard, N., & Motamedi, K. (2014). .2: Application of UrbanSim in Paris (Ile-de-France) Case study. *Cahier de recherche 2014-33*. HAL Id: hal-01092045

Devine-Wright, P. (2011). Renewable Energy and the Public: from NIMBY to Participation. London: Earthscan Ltd.

Drews, S. (2017). Public views on economic growth and the environment. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 43-48). BfN-Script 460.

Felsenstein, D., Axhausen, K., & Waddell, P. (2010). Land use-transportation modeling with UrbanSim: Experiences and progress. *Journal of Transport and Land Use*, *3*(2),

107-127.

Fonteyn, M. E., Kuipers, B., & Grobe, S. J. (1993). A description of think aloud method and protocol analysis. *Qualitative Health Research*, *3*(4), 430-441.

Gardner, G. (2016). Imagining a Sustainable City. In *State of the World* (pp. 3-9). Island Press, Center for Resource Economics.

Jabareen, Y. R. (2006). Sustainable urban forms their typologies, models, and concepts. *Journal of Planning Education and Research*, *26*(1), 38-52.

Mont, O., Neuvonen, A., & Lähteenoja, S. (2014). Sustainable lifestyles 2050: stakeholder visions, emerging practices and future research. *Journal of Cleaner Production*, *63*, 24-32.

Hohle, S. M. & Teigen, K. H. (2017). The trend effect: When a forecast is revised, people believe it will continue changing. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 35-41). BfN-Script 460.

Waddell, P. (2002). UrbanSim: Modeling urban development for land use, transportation, and environmental planning. *Journal of the American Planning Association*, *68*(3), 297-314.

Xenias, D., & Whitmarsh, L. (2013). Dimensions and determinants of expert and public attitudes to sustainable transport policies and technologies. *Transportation Research Part A: Policy and Practice*, *48*, 75-85.

8 “We” turn(s) the tide!: Towards a social identity approach on environmental crises

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Individuals do not cause global environmental crises, such as climate change or deterioration of biodiversity, nor can they stop them. This is not denying the human-made nature of these phenomena but highlighting the restricted effect of *individuals'* actions. Instead, human *collectives* cause these crises and they are as well the agents who may mitigate it. Psychologically, this makes a huge difference. Individuals can easily dispute their *personal* connection to environmental crises and thus their responsibility to solve it. This is much more difficult for large-scale *collectives*, such as, for instance, nations, lifestyle groups, or ideological groups (although some try to do so). At the same time, collectives may bring about significant changes while the actions of an isolated individual would rarely attain that. Even though some people refrain from consuming animal products, do not travel by plane or private car, and live in recently insulated homes, global warming will continue to rise as long as these behaviors are not adopted by collectives. This can lead to both ignorance and/or a sense of helplessness in individuals.

The tide may turn when people define their self via membership in a social group, when they change the mental “I” for a “We” as the salient definition of the self. Under these conditions of social identity focus, they may perceive responsibility of the self and see avenues to (collective) action. In the present contribution I will briefly sketch how a social identity perspective may help to better understand and predict people's appraisals of and responses to large-scale environmental crises and I will highlight some examples from our own lab that illustrate how social identity effects might be studied empirically and how they may be used for pro-environmental interventions.

8.1 The social identity approach

The social identity approach (Tajfel & Turner, 1979; Reicher, Spears & Haslam, 2010) opened up researchers' eyes for the collective dimension of how people think and act. Seemingly merely individual or interpersonal acts, such as dressing, shopping, or arguing with another person, have, in fact, often a collective dimension. This becomes obvious, when people of the same group dress similarly, boycott similar products, or approach a person who belongs to the “wrong” group (e.g., of climate change deniers). The social identity approach does not infer that individuals' behavior is secretly guided by an underlying social structure, as some sociologists may. Instead, people are assumed to often even explicitly think and act as “the” group, indicated, for instance, by using the personal pronoun “we”. They do so when in a situation their membership in a specific group becomes salient, leading to self-categorization (Turner, Hogg, Oakes & Reicher, 1987). This is most likely, when, as a consequence of social comparisons, they perceive themselves being very similar to a group of other individuals who are similar to each other as well. Self-categorization is further fostered when people recognize an outgroup whose members differ markedly from the ingroup. Self-categorization and high centrality of this social category for self-definition is necessary for ingroup identification to occur. However, at the same time, ingroup identification implies and presupposes individuals to be satisfied by their group membership and feel a sense of solidarity with the group (Leach et al., 2008).

The formation and consequences of social identity are not only determined by cognitive and affective factors but also follow from social identity motives, such as self-esteem, uncertainty reduction and control. Accordingly, people join or try to form high-status groups that provide *self-esteem* (Tajfel & Turner, 1979). They identify with highly homogeneous and distinctive ingroups to *reduce uncertainty* about the self (Hogg, 2007). Furthermore, people identify with highly agentic groups or join in collective action and behavior to foster their *sense of controlling* the world around them through their (social) self (Fritsche et al., 2013; Stollberg, Fritsche & Jonas, in press).

The latter approach of group-based control (Fritsche et al., 2013) suggests that people are inclined to perceive groups as agents. This may not just help people to maintain perceptions of control when they doubt their personal efficacy in tackling problems of tremendous scale, such as global environmental crises. Also, the perception of being both part and representative of a collective agent may motivate people to act upon large-scale environmental crises that are beyond personal influence. When being about to act collectively, as a group member, people need to know what the group stands for (i.e., ingroup norms) and whether it may have an impact (i.e., collective efficacy). Recent studies from our own lab have studied whether perceptions of collective efficacy empower people to act for solving environmental crises and how salient pro-environmental ingroup norms give their behavior direction (for the topic of environmental community initiatives, see Sloot, Jans and Steg (2017) in this issue).

8.2 Collective efficacy

Collective efficacy has been defined as the perception that the ingroup has “control, influence, strength, and effectiveness to change a group-related problem” (van Zomeren, Postmes & Spears, 2008). Earlier, correlational, research (e.g., Homburg and Stolberg, 2007) indicates that collective efficacy is a better predictor of people’s pro-environmental intentions than personal efficacy. Following up on this, we (Jugert et al., 2016) experimentally tested whether in fact salient collective efficacy drives individuals’ environmentalism and not, vice versa, collective efficacy is a result of personal pro-environmental attitudes. In three studies in Germany and Australia, we randomly assigned our participants (most of them students and other young people) to either a high or a low collective efficacy salient condition. In the high efficacy salient condition of one of these studies, people were asked to read a faked online news magazine report, titled “Generation U30 Is Making the Switch to New Mobility” and then reporting on various efforts people under 30 make to increase sustainable traffic options and that indeed these actions have been shown to have a measurable effect. In the low efficacy salient condition, people read an identical article with the exemption that it was titled “Generation U30 Is *Not* Making the Switch to New Mobility” and that the article reported that all efforts were useless to increase sustainable traffic. Across the studies, we used very similar manipulations. Across all three studies we found that according to mediation analyses the manipulation indirectly increased people’s intention to act in a pro-environmental fashion. It did so by affecting participants’ perceptions of collective efficacy, which in turn increased perceptions of personal efficacy that finally led to an increase in behavior intention.

These data suggest that increasing personal self-efficacy is a necessary step for collective efficacy perceptions to work. And indeed, we (Jugert et al., 2016) were able to sustain this interpretation in a fourth study in which we not only manipulated collective but personal efficacy as well. We again found the abovementioned mediational chain from collective efficacy to behavior intention for the condition in which we had made high potential personal efficacy

salient by asking people of thinking about ways in which individuals may contribute to tackling climate change. However, no such effect occurred for those people who had been asked to think about their lacking personal efficacy in combating climate. Obviously, a sense of potential personal efficacy is necessary for perceived collective efficacy to enhance people's readiness to engage in pro-environmental action.

Of importance, these behavior intentions referred to private-sphere behavior intentions. That is, collective action that is driven by social identity processes does not have to be public-sphere or protest behavior that is performed together with physically present others. Instead, very often social identity processes and behaviors may occur just in the head of an individual group member or are just expressed individually. This perspective extends earlier approaches to understand societally or politically relevant social identity processes, such as the social identity model of collective action (SIMCA; van Zomeren et al., 2008) which was tailored to explain public movement participation.

8.3 Ingroup norms and goals

For group-membership to drive individuals' pro-environmental behavior it is not sufficient that they attribute collective agency to the group. As a crucial addition, people have to associate pro-environmental norms or goals with their group. While such pro-environmental standards are of course associated with environmental action groups (e.g., a local nature conservation group), also any other group that people are part of could potentially be perceived as positively sanctioning environmentalism. In fact, pro-environmental norms are shared within many important everyday ingroups, such as one's own neighborhood (see also Hamann (2017) in this issue), hometown, or national group. However, as such groups can be characterized by a multitude of (sometimes even contradicting) norms, it is important for an ingroup norm to be salient in situations when people decide how to act (cf. Cialdini, Kallgren & Reno, 1991). If it is, people who are identified with their ingroup will conform to this norm to some extent and thus show increased pro-environmental action intentions. Studies by Masson & Fritsche (2014) have shown that this is not true for all high identifiers. Here, it is not sufficient that people think they are similar to a homogeneous ingroup (self-definition) but they need to be affectively and motivationally invested group members (i.e., ingroup membership is central for defining the self, is satisfying, and is associated with a sense of solidarity towards other ingroup members; Leach et al., 2008). This is indicated in two studies in which German university students were either assigned to a high norm or a low norm salience condition. In the high norm salience condition, people were presented some fake survey data indicating that 76% of their fellow students preferred to purchase organic (vs. non-organic) food and that 74% expected their fellow students to purchase organic food. In the low norm condition, the numbers were substantially lower (21% and 22%), indicating that organic food consumption is not an ingroup norm. Manipulated high norm salience increased the organic food purchase intentions of those students who scored highly on a measure of self-investment in the group of students but not of those who obtained low scores on this measure. No such effect was observed for self-definition scores.

Studies like this demonstrate that pro-environmental ingroup norms are an important driver of group-members' environmental behavior (intentions). However, intriguingly, and of some importance for planning interventions, lay people seem to be quite unaware of the strength of these effects on their environmental behavior. This was first discovered by Nolan, Schultz, Cialdini, Goldstein, and Griskevicius (2008). They first asked consumers to guess how much

each of a list of factors determined the extent to which they conserve energy. Then, the researchers measured each of these factors and correlated it with respondents' actual energy consumption (by reading electric meter values at their homes). Strikingly, whereas respondents indicated the factor "that a lot of other people are trying to conserve energy" (social norm) as being of much less importance than other tangible (saving money) or ideological (e.g., protecting the environment) factors, social normative beliefs about what "a lot of others" do turned out to be the most important predictor of actual energy use in the correlational study.

Would this effect generalize to other domains of pro-environmental behavior? And would the ignorance towards norm effects generalize to the effects of other social identity factors as well? We investigated these questions in a study on people's intention to use an electric car in the future (either buying one or becoming a customer of an e-car-sharing company; Barth, Jugert & Fritsche, 2016). For planning interventions it is crucial that intervention experts know about which psychological processes guide people's pro-environmental behavior. Thus, we first asked e-mobility experts, such as e-mobility lobbyists, traffic scientists and relevant decision-makers, what would be the most important factors that increase or reduce the acceptance of e-car use. As most important factors they mentioned the environmental impact of e-cars, the purchase and maintenance costs as well as technical aspects such as range and the availability of infrastructure. A very similar pattern occurred for a sample of laypersons surveyed at a public marketing event by the local energy supplier. Of interest, neither e-mobility experts nor lay people mentioned any of the social identity factors. This was in stark contrast to a second study on a general population sample that was approached online. Here, we measured all possible causal factors mentioned by the participants of the earlier studies as well as collective efficacy beliefs and the perceived social norms of "relevant others" and of two different ingroups (i.e., people's neighborhood and region they lived in). Multiple regression analysis showed that socio-demographic variables, personal experience and knowledge, personal costs and benefits (i.e., personal costs, maintenance costs) and personal sustainability attitudes significantly predicted people's intention to use an e-car in the future (standardized regression coefficients from .07 to .14). Over and above this, the social identity variables explained additional variance in e-car intention (coefficients from .09 to .29). This supports the notion that collective efficacy and ingroup norms have a considerable impact on people's environmental decisions but that this impact is usually overlooked by lay people and even by intervention experts.

8.4 Conclusions

A social identity perspective uncovers the collective dimension of seemingly individual decisions that guide people's pro-environmental behavior. We have shown this for both perceptions of collective efficacy and ingroup norms which affected pro-environmental intentions in various domains. Thus, social identity processes are not just relevant for explaining classic collective action in face-to-face groups or environmental action groups but even unfold their impact in everyday behavior of non-activists. This happens in situations when membership in a social ingroup that people are invested in is salient.

In addition to determining pro-environmental action, social identity processes may also affect the appraisal of environmental crises. This is particularly obvious for some ideological groups for whom denying scientific evidence on climate change seems to be self-defining (McCright & Dunlap, 2011). At the same time, appraisals of threatening environmental crisis can drive

social identity processes by increasing global ethnocentric tendencies (Fritsche, Cohrs, Kessler & Bauer, 2012). Under this condition the role of social identity variables, such as salient ingroup norms, for determining people's environmental behavior will be further strengthened (Fritsche, Jonas, Niesta-Kayser & Koranyi, 2010). This indicates that policy makers will have to consider the role of salient social norms (i.e., what it means to be a group member) for people's behavior intentions particularly in times when people perceive societal crises, such as environmental or economic crises.

It seems crucial to promote targeting social identity variables in pro-environmental interventions and policies. For instance, framing pro-environmental action as an effective collective endeavor would be likely to increase committed ingroup members' environmentalist actions and behaviors. Promoting and appropriately tailoring such interventions is a role, psychologists have to play, because outside psychology there seems to be low awareness of the potential social identity processes have for explaining and changing environmental behavior.

References

Barth, M., Jugert, P., & Fritsche, I. (2016). Still underdetected: Social norms and collective efficacy predict the acceptance of electric vehicles in Germany. *Transportation Research Part F: Traffic Psychology and Behaviour, 37*, 64-77.

Cialdini, R. B., Kallgren, C. A. & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (vol. 24, pp. 201-234). San Diego: Academic Press.

Fritsche, I., Cohrs, C., Kessler, T., & Bauer, J. (2012). Global warming is breeding social conflict: The subtle impact of climate change threat on authoritarian tendencies. *Journal of Environmental Psychology, 32*, 1-10.

Fritsche, I., Jonas, E., Ablasser, C., Beyer, M., Kuban, J., Manger, A.-M., & Schultz, M. (2013). The power of we: Evidence for group-based control restoration. *Journal of Experimental Social Psychology, 49*, 19-32.

Fritsche, I., Jonas, E., Niesta Kayser, D., & Koranyi, N. (2010). Existential threat and compliance with pro-environmental norms. *Journal of Environmental Psychology, 30*, 67-79.

Hamann, K. R. S. (2017). Sticker in the Box! The influence of injunctive and descriptive norms on anti-ads sticker use. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 15-19). BfN-Script 460.

Hogg, M. A. (2007). Uncertainty-identity theory. In M. P. Zanna, *Advances in experimental social psychology* (Vol. 39, pp. 69-126). San Diego, CA, US: Elsevier Academic Press.

Homburg, A., & Stolberg, A. (2006). Explaining pro-environmental behavior with a cognitive theory of stress. *Journal of Environmental Psychology, 26*, 1-14.

Jugert, P., Greenaway, K. H., Barth, M., Büchner, R., Eisentraut, S., & Fritsche, I. (2016). Collective efficacy increases pro-environmental intentions through increasing self-efficacy. *Journal of Environmental Psychology, 48*, 12-23.

Leach, C. W., Van Zomeren, M., Zebel, S., Vliek, M. L. W., Pennekamp, S. F., Doosje, B., Ouwerkerk, J. W., & Spears, R. (2008). Group-level self-definition and self-investment: A hierarchical (multicomponent) model of in-group identification. *Journal of Personality and Social Psychology, 95*, 144-165.

Masson, T., & Fritsche, I. (2014). Adherence to climate change related ingroup norms: Do dimensions of group identity matter? *European Journal of Social Psychology, 44*, 455-465.

McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001-2010. *The Sociological Quarterly, 52,* 155-194.

Nolan**,** J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin, 34,* 913-123.

Reicher, S. D., Spears, R., & Haslam, S. A. (2010). The social identity approach in social psychology. In M. S. Wetherell & C. T. Mohanty (Eds.), *Sage Identities Handbook* (pp.45-62). London: Sage.

Sloot, D., Jans, L. & Steg, L. (2017). The potential of environmental community initiatives – a social psychological perspective. In A. Römpke, G. Reese, I. Fritsche, N. Wiersbinski & A. Mues (ed.), *Outlooks on Applying Environmental Psychology Research* (p. 27-34). BfN-Script 460.

Stollberg, J., Fritsche, I., & Jonas, E. (in press). The groupy shift: Conformity to liberal in-group norms as a group-based response to threatened personal control. *Social Cognition*.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The Social Psychology of intergroup relations.* (pp. 33-47). Monterey,CA: Brooks/Cole.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory.* Cambridge, MA, US: Basil Blackwell.

Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: A quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin*, *134*, 504–535.

Appendix A: Program of the Summerschool

Monday, 06th of June 2016

19.30 Welcome
Norbert Wiersbinski & Andreas Mues (BfN)
Gerhard Reese (Friedrich-Schiller-University Jena, University of Koblenz-Landau)

20.00 Keynote I
Immo Fritsche (University of Leipzig)

Tuesday, 07th of June 2016

Young Researchers Talks

09.00 The power of identity for increasing environmentally significant behavior Alina Udall (University of Bath)

Affixing the theory of normative conduct (to your mailbox): Injunctive and descriptive norms as predictors of anti-ads sticker use
Karen Hamann (Friedrich-Schiller-University Jena)

10.00 The constrains of norm activation for the consumers' purchase intention of sustainable clothes
Aneta Woznica (MSH Medicalschool Hamburg)

The other side of the coin: the relationship between motives for smart technology adoption and subsequent sustainable energy behaviours.
Annemijn Peters (University of Groningen)

11.15 Let's build a city – Exploring people's understanding of sustainable urban design using a mixed-methods approach
Gustav Bösehans (University of Bath)

The power of the neighbourhood: The spread and success of bottom-up initiatives in the energy market
DANIEL SLOOT (UNIVERSITY OF GRONINGEN)

13.30 Guided tour on Vilm Island

15.15 Keynote II
JUDITH DE GROOT (UNIVERSITY OF BATH)

16.45 The Trend Effect: Lay People's Interpretation of Revised Climate Forecasts
SIGRID HOHLE (SIMULA RESEARCH LABORATORY, UNIVERSITY OF OSLO)

Public Views on Economic Growth, the Environment and Prosperity: Survey Results
STEFAN DREWS (AUTONOMOUS UNIVERSITY OF BARCELONA)

17.45 Collaborative Consumption: Hype or Promise?
FRIEDEL BACHMANN (UNIVERSITY OF ZÜRICH)

20.00 Promotion of global identification and globally responsible behavior through international contact
ANNE RÖMPKE (UNIVERSITY OF LEIPZIG)

Wednesday, 08th of June 2016

09.00 Keynote III
WOUTER POORTINGA (CARDIFF UNIVERSITY)

Workshops

10.00 Workshop phase I – WOUTER POORTINGA, JUDITH DE GROOT, IMMO FRITSCHE

14.00 Workshop phase II - WOUTER POORTINGA, JUDITH DE GROOT, IMMO FRITSCHE

16.20 Workshop phase III - WOUTER POORTINGA, JUDITH DE GROOT, IMMO FRITSCHE

20.00 Informal discussions

Thursday, 09th of June 2016

09.00 Workshop presentations

10.15 Summerschool evaluation

11.00 Departure

For more information see: https://vilmworkshop.jimdo.com/