From guilty conscience to collective climate action:

The role of negative moral emotions in motivating individual and group-based pro-environmental behavior

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Each of us has cause to think with deep gratitude
of those who have lighted the flame within us.
– Albert Schweitzer

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"*Look deep into nature, and then you will understand everything better*."
– Albert Einstein

Summary

Climate change is one of the most urgent problems of our times, and social psychological theories and research paradigms seem particularly well suited to help address it. Yet, a social psychology of climate change is emerging only fairly recently and still lacking unified theoretical frameworks. More specifically, little is known even about individuals' basic emotional reactions when being confronted with the climate crisis – and if or how these basic reactions translate into action. Can insights from social psychological research be readily applied to the realm of environmental psychology? Are individuals emotionally affected when they reflect upon climate change? If so, to what extent and particularly what kind of emotions do they experience – do they feel guilty and ashamed for the way we humans treat the environment and for what we leave behind for future generations? And do these emotions translate into real action or are they merely linked with abstract behavioral intentions? Ultimately, what kind of action would be necessary to "change the world" toward a more sustainable future? And how can such behaviors be adequately conceptualized and encouraged?

From a practical point of view, answers to these questions are absolutely crucial as they may decide about success or failure of interventions aimed at motivating real pro-environmental behavior or profound societal change. In fact, as we shall see, effective and

sustained societal change may not be achieved at all through interventions addressing individual behavior but only via concerted, collective climate action.

The current thesis comprises a set of studies designed to offer an outline of how a research program could systematically contribute to our basic understanding of the emotional processes associated with the climate crisis. It further investigates and systematizes the motivational factors contributing to individuals' willingness to engage in collective climate action. As will be shown, confrontation with human-caused environmental damages can evoke a guilty conscience (i.e., the negative moral emotions of guilt and shame), which, in turn, can lead to individual behavioral intentions – and actual pro-environmental behavior (Manuscript #1). In a next step, the socio-demographic anatomy of this "climate conscience" will be investigated to gauge the potential it may hold in order to motivate broad, societal change. The study also shows that objective individual carbon dioxide (CO_2) emissions are negatively linked with the subjective willingness to act more environmentally friendly – and that this link can be explained by a lack of climate conscience (Manuscript #2). Finally, this guilty conscience will be placed among other, more cognitive variables in an integrative model of the determinants of individuals' intention to engage in collective climate action (Manuscript #3). It will be argued that the latter is a form of behavior that can be much more demanding than one-off individual behavior – but also much more effective in promoting real societal change. This model is proposed not only to help systematize some of the emerging scientific work on the social psychology of climate change, or collective action more generally, but also in the hope of offering a useful heuristic for practitioners working in the field. On the following pages, I introduce the most important topics and concepts that are useful to place the studies that will be presented afterwards in a broader context. First, however, let us have a look at what the future might look like if no fundamental changes occur.

"What we take for granted might not be here for our children."
– Al Gore

Prologue: A snapshot of the future

Before we get technical, take a moment to imagine the following scenario: *It is seven in the morning. A warm and rainy morning although the end of the year is approaching. There was a time when this season was called* winter *– but that was back in the day when we still had reliable seasons. Before the years of the "coldest winter and hottest summer ever recorded" – and the other way round. Somehow, the whole concept of seasons became a sketchy business and it didn't take long for people to abandon it altogether.*

You are on your way to work, hectically dodging people. There seem to be more every day, some sleeping in the hallway of your housing block, some queuing for food stamps across the street, some on their way to work just like you. The world population has recently peaked at ten billion, and the sheer quantity, as well as the general global situation led to a dramatic crisis. Facing an increasing number of climate refugees*, Europe and other Westernized countries were no longer able to sustain their isolationist asylum policies. Hundreds of thousands, maybe millions, fled from the "water wars" in Africa – after substantial amounts of drinking water had either been contaminated by industrial waste or were lost because of glacial melting, water has become the most heavily contested resource. Other refugees came from cities that were completely lost to the rising water – former metropolises like New York, London, Bangkok, Manila, or Venice. Many of these places had once been popular and prosperous because of their proximity to the sea. In the end, it was their demise: Over the last years, one after another, they simply disappeared under the water.*

There were attempts of re-settling those who had to abandon their homes close-by; but then again, the options were limited: Destructive exploitation of the natural soil had left large

areas uninhabitable – in South America, the US, and across the globe. Many other areas are now needed to cover the growing world population's demand for food. Back then, you were told, people ate animals for food – a rare luxury nowadays as food had to be rationed a while ago already to make sure the basic requirements for food supply were covered. Many starved to death – and still starve every day.

You pause for a moment and imagine what life must have been like before all of this, before everything went down the drain. And what people back then must have thought. Apparently, when people in the beginning 21st century realized the insane amount of energy they would need to maintain their lavish lifestyle, the destructive effects their decisions would have on the natural environment and for future generations, the necessity of changing something immediately, they did... nothing.

As you will have realized, this is a dystopic vision of a potential future, inspired by movies such as Interstellar (2014), Mad Max II (1981), Soylent Green (1973) or Harrison's (1966) novel on which the latter was based. The bad news is, however, that much of what you have just read also converges with current scientific assessments about how anthropogenic climate change will affect the very world we live in. It is based, for example, on the current predictions of the Intergovernmental Panel on Climate Change (IPCC, 2014; for an accessible but pessimistic scientific view of the potential future see Emmott, 2013). In fact, wherever possible on the preceding page and a half, the most conservative and optimistic predictions were used.

"*The Earth was singing her revolution.*
She was calling her brave men and courageous women to her defense."[1]

Introduction

There is general consensus that the climate on Earth is changing, with evidence of measurable impact on all continents and across the oceans, and that human activities are one of the main drivers of climate change (e.g., Bray, 2010; IPCC, 2014; National Academies of Science, 2008; Oreskes, 2004). As one prominent example, the average temperature of the planet's surface has increased by about 0.8 °C since the beginning of the 20th century. Approximately 0.6 °C of this change occurred since 1980 with a steady successive rise of surface temperatures (e.g., American Meteorological Society, 2012; IPCC, 2013, 2014). Recent studies predict a further increase of global surface temperature during the 21st century by at least 0.3 to 1.7 °C – or by 2.6 to 4.8 °C if no effective measures are taken to mitigate climate change (e.g., IPCC, 2014). While the causes and consequences of global warming are still investigated and sometimes heavily debated[2], Oreskes (2004), for example, inferred, based on a review of 928 pertinent articles published between 1993 and 2003, that "there is a scientific consensus on the reality of anthropogenic climate change" (p. 1686). It is now almost certain that changes in the planet's surface temperature are driven by CO_2 emissions linked directly with human activities. In their 2013 report, the IPCC conclude that it is

[1] Quote from Sun, R. (2013). *Steam Drills, Treadmills, and Shooting Stars: A Story of our Times.* El Prado, NM: Rising Sun Press Works. (p. 139)

[2] As one often-quoted example, Hsiang and colleagues (Hsiang & Burke, 2014; Hsiang, Burke, & Miguel, 2013; Hsiang, Meng, & Cane, 2011; see also Burke, Miguel, Satyanath, Dykema, & Lobell, 2009) reported a series of analyses linking climate with human conflict and hence diverged from Buhaug (2010) who claimed that "climate variability is a poor predictor of armed conflict" (p. 16477). They were heavily criticized, mainly by the latter, (Buhaug, 2014; Buhaug et al., 2014) for "biased decisions" and statistical errors in their work (see Hsiang, Burke, & Miguel, 2014, for a reply). While popular media focused on the controversy (e.g., Becker, 2013; Roach, 2013), there now seems to be an emerging scientific consensus that climate change can, in fact, increase the risks of armed conflict under certain circumstances even if there may be a variety of contributing factors (IPCC, 2014; Scheffran, Brozska, Kominek, Link, & Schilling, 2012). The IPCC (2014) conclude that "the presence of institutions that are able to peacefully manage conflict are [...] the critical factor in mediating such risks" (p. 772).

"extremely likely (95-100%) that human influence has been the dominant cause of the observed warming since the mid-20th century" (IPCC, 2013, p. 17).

While global warming can by now be considered a well-established indicator of anthropogenic climate change, it is important to note that there are other symptoms of climate change, some of which have been linked with human activities. Examples include an increasing number of species committed to extinction (Thomas et al., 2004), glacier mass loss (Marzeion, Cogley, Richter, & Parkes, 2014), as well as decreases in the availability of drinking water (Barnett, Adam, & Lettenmaier, 2005) and crop yields which might affect developing countries even more severely than Westernized societies (Rosenzweig & Parry, 1994; Schlenker & Roberts, 2009). It is almost safe to conclude that, by the end of the 21st century, the climate on Earth will have changed dramatically – and that we are all, by action or inaction, more or less responsible for this change.

As the human contributions and devastating consequences of climate change become more and more obvious, calls for action become louder and louder. While they still seem highly nonbinding and increasingly hypocritical in the realm of policy making (for a current example, see Diamond, 2014; Goldenberg, Taylor, & Branigan, 2014; Landler, 2014), more concrete reactions can be observed in civil society (e.g., taking the form of neighborhood-based pro-environmental initiatives) and the sciences (e.g., taking the form of special divisions, specialized journals or working groups). The present work was conducted with the aim of contributing to this body of research in environmental and social psychology, but also to contribute to the wider interdisciplinary discourse. Finally, it was assembled in order to offer ideas and heuristics for practitioners working in the field.

Only fairly recently has social psychological research set out again to investigate reactions to the climate crisis. However, research in the field that seems to be re-emerging since 2006 (Swim, Markowitz, & Bloodhart, 2012) is mostly unsystematic and often lacks a

specific research agenda or comprehensive framework. Such frameworks would not only help organize and guide research in the area. They can also highlight parts that are still missing from the puzzle (i.e., need for future research) and connecting parts (i.e., links to other research areas). On a meta-theoretical level, the current research was also conducted to highlight the potential for research across the boundaries of disciplines (Manuscripts #1 and #2) and sub-disciplines (Manuscripts #1 and #3).

From a historical perspective, the current lack of systematic social psychological research programs is noteworthy because quite a few classical studies have focused on the social psychology of climate change. After summarizing some of the most influential of these studies below, we will see that there are concepts from other areas of social psychology that should be adaptable – or have already been adapted – to the area of climate change (i.e., connecting parts of the puzzle). More specifically, the emotions that individuals might experience in reaction to being confronted with climate change and research on their correlates will be presented. As we shall see, and as can be learned from this area of social psychological research, some emotions might be linked more strongly with abstract behavioral intentions while others might be linked more strongly with actual behavior. In order to fully appreciate the complexity of pro-environmental behavior, it may be useful to differentiate between these two forms of reactions, intentions versus action (or, as we will see, intent versus impact). I will also briefly introduce the notion of social identity, another psychological concept that may help to bridge some of the gaps in the emerging literature, for example gaps between behavior as an individual versus behavior as a member of a certain group (e.g., as a member of a climate protection initiative or on behalf of future generations). Finally, we will put together these seemingly disparate pieces of the puzzle to compose a framework of how collective climate action may be conceptualized, predicted, and, ultimately, encouraged.

"Scientists, therefore, are responsible for their research, not only intellectually but also morally."[3]

The social psychology of climate change

The general notion put forward in this work, namely that (social) psychology can help address the problem of climate change, is not a new one (Clayton & Brook, 2005; Gifford, 2008). Fielding, Hornsey, and Swim (2014) in their editorial to the *European Journal of Social Psychology*'s special issue on the social psychology of climate change, argue that social psychology in particular "has a long tradition of theory and research that is relevant to addressing key climate change questions" (p. 413). In fact, from seminal work in the contexts of attitudes and attitude change (Borden & Francis, 1978; Dunlap, 1975; for a rarely cited early German source see Amelang, Tepe, Vagt, & Wendt, 1977), behavior (Ajzen & Fishbein, 1980; Blake, 1999; Diekmann & Preisendörfer, 1992; Fishbein & Ajzen, 1975; Kollmuss & Agyeman, 2002; for meta-analyses, see Bamberg & Möser, 2007; Hines, Hungerford, & Tomera, 1986/87), social influence (Cialdini, Reno, & Kallgren, 1990; Goldstein, Cialdini, & Griskevicius, 2008; Reese, Loeschinger, Hamann, & Neubert, 2013; Reese, Loew, & Steffgen, 2014) all along to inter- and intragroup behavior (Ferguson & Branscombe, 2010; Ferguson, Branscombe, & Reynolds, 2011; Harth, Leach, & Kessler, 2013), social psychological research has either immediate relevance for or even been directly linked with environmental behavior and climate change.

Prominently, Cialdini and colleagues investigated the role of social norms for individuals' environmental behavior, for example showing that littering was significantly less likely in clean settings (implying an "anti-littering norm"; Cialdini et al., 1990) or that hotel

[3] Quote from Capra, F. (1984). *The Turning Point: Science, Society, and the Rising Culture*. New York: Bantam Books. (p. 87)

guests were more likely to reuse towels when they were presented with certain types of norms (Goldstein et al., 2008; see also Bohner & Schlüter, 2014; Reese et al., 2013; Schultz, Khazian, & Zaleski, 2008). While the role of social norms in preventing or promoting certain behaviors, and environmental behaviors in particular, has been widely studied, curiously, the concept is currently absent from some influential social psychological theorizing in the context of eco-behavior. It will be a key aspect to be re-introduced in Manuscript #3.

To complement the cognitive, "cold" concept of social norms, however, let us first consider another, "hotter" reaction to being confronted with climate change that has also been identified as an important topic to study (Bamberg & Möser, 2007). As we shall see, social psychology has a lot to say about moral emotions in reaction to environmental damages.

"*Because somewhere inside of you, you know the truth.*
You know how things ought *to be*.
And that the source of this world's ills came from something you *did.*"[4]

Emotions in reaction to climate change

There are different emotions that individuals may experience when being confronted with the problem of climate change (the reader may recall some of the thoughts and emotions he or she experienced in reaction to the dystopic prologue). While the positive effects of pleasant emotions such as anticipated pride for behaviors in line with one's personal environmentally friendly norm (Onwezen, Antonides, & Bartels, 2013) or hope for constructive change (Ojala, 2012) have recently been documented, the focus of the current brief overview will be on negative emotions in response to climate change.

[4] Quote from Loeb, J., Pacheco, C., & Merino, J. (2005). *Superman/Batman: Absolute Power*. New York: DC Comics. (p. 89)

In an attempt to systematize these negative emotions, Böhm (2003) distinguished two different types of emotions that she subdivided further into two forms of specific emotion types each: *consequence-based* emotions (consisting of *prospective* consequence-based emotions such as fear or worry and *retrospective* consequence-based emotions such as sadness or sympathy) and *ethics-based* emotions (consisting of *other-related* ethics-based emotions such as anger and outrage and *self-related* ethics-based emotions such as guilt and shame). As climate change is strongly linked to moral issues of social justice, equity, and fairness (Grasso & Markowitz, in press; Markowitz, 2012; Pfister & Böhm, 2001), one might expect that moral emotions should be among the first emotions individuals experience when thinking about climate change. At the same time though, self-related moral emotions such as guilt and shame are highly aversive emotional states that individuals will try to avoid (Lewis, 1971). Accordingly, other-related ethics-based emotions tend to be reported by participants more frequently than self-related ethics-based emotions. Across a list of 20 environmental risks, Böhm (2003), for example, found much higher mean emotional responses in the form of anger (M = 3.88 on a 7-point rating scale ranging from 1 = ‘not at all’ to 7 = ‘very much’) and outrage (M = 3.80) than guilt (M = 2.77) or shame (M = 2.29). In order to motivate individuals to behave more environmentally friendly, however, guilt and shame might be particularly useful because of their “default” links with certain behavioral tendencies.

The dynamics and correlates of these two emotions will be one main focus of the studies to be reported and they will be discussed in more detail in Manuscript #1. As will be argued, much can be learned from research on emotions in interpersonal and intergroup relations. Traditionally, in these lines of research, guilt and shame, both belonging to the family of negative self-focused emotions, have been conceptualized as distinct emotions with distinct phenomenologies and linked with distinct behavioral tendencies (Allpress, Barlow, Brown, & Louis, 2010; Frijda, Kuipers, & ter Schure, 1989; Gausel & Leach, 2011; Lewis,

1971; for a study linking emotions and action tendencies in the environmental context, see Böhm & Pfister, 2000). Many researchers have understood guilt as a negative emotion resulting from a focus on a certain behavior that has negatively affected or harmed others. Shame, on the other hand, has been conceptualized as an emotion caused by a perception of global defectiveness that is reflected in the specific behavior (Gausel & Leach, 2011; see also Harth, Kessler, & Leach, 2008). Allpress and colleagues (2010) summarize this traditional view of guilt and shame: "guilt arises because one has behaved badly, whereas shame arises because one is a bad person" (p. 77). Based on this classic conceptualization, guilt has usually been linked with pro-social behaviors and shame with anti-social behaviors. In other words, when one has behaved badly, one can react by apologizing or repairing the damage done. But if one is a bad person, the only possible ways of avoiding the negative emotion is to hide or avoid the issue – according to the traditional conceptualization. As will be discussed, however, this traditional conceptualization has been challenged over the last years by empirical findings and theoretical work (e.g., Allpress, Brown, Giner-Sorolla, Deonna, & Teroni, 2014; Deonna, Rodogno, & Teroni, 2011; Gausel & Leach, 2011).

With regard to the conceptualization of guilt and shame, the current work is strongly influenced by and relying on a body of research on guilt and shame in intergroup conflict (Allpress et al., 2014; Gausel, Leach, Vignoles, & Brown, 2012; Rees, Allpress, & Brown, 2013). In turn, this thesis contributes to the field of emotion research by extending it to the realm of climate change and testing the validity of recent theorizing for this very different context. Across all studies that will be reported, particularly in Manuscripts #1 and #3, shame was consistently linked with constructive reactions to being confronted with climate change. These links were either equal to or even stronger than those of guilt. As will be further elaborated in Manuscript #1, guilt has sometimes been shown to be linked more strongly with abstract behavioral intentions rather than actual behavior (e.g., Allpress et al., 2010). But why

is the difference between behavioral intentions and actual behavior so important – and why might it be particularly important in the environmental context?

"Life was always a matter of waiting for the right moment to act."
– Paulo Coelho

Pro-environmental behavior

In order to understand pro-environmental behavior, a clear definition is needed as to what exactly is meant by this expression. As trivial as this statement may sound, consider the following two examples (based on Bamberg & Rees, in press): John, on the one hand, would describe himself as a "green", environmentally friendly person. He lives just outside a medium-sized city, recently replaced his old washing machine with a new, more efficient and more environmentally friendly one, and took great care to find a car that complies with the newest eco-standards when he bought one to commute to work every day. Obviously, he also tries to use his bike as often as possible, for example, when he does his weekly grocery shopping. As John knows that the production and transportation of meat contributes to the amount of global greenhouse gas emissions, he only buys locally produced, organic food and has reduced his meat consumption to a maximum of twice a week. He thinks that much more could and should be done to protect the environment and was inspired by some of the local initiatives that he learned about on his yearly visits to South America – a place that he fell in love with during a year abroad while completing his Master's degree there.

Mark, on the other hand, does not care much about environmental issues. He lives in a small flat in the city center and, while it would make things easier sometimes, does not own a car. The purchase and maintenance would simply be too expensive for him – and he can get from his place to almost anywhere in the city in less than 30 minutes by public transportation.

Mark thinks that waste separation is a waste of time (he has seen a documentary recently, showing that during garbage removal, most of the waste is mashed together again anyway), is generally bored by political issues, and did not vote in the last elections. As he hates travelling, he rather spends time with his friends in the local pub whenever he can.

Everyone would probably agree that, by the descriptions above, John is the more "pro-environmental" (and possibly also the more likeable) person of the two: He reflects on his behaviors and makes a conscious decision to try and behave in environmentally friendly ways. However, Mark's lifestyle is, in fact, less environmentally damaging from an objective point of view (see Bamberg & Rees, in press; Gatersleben, Steg, & Vlek, 2002). To explicitly acknowledge these two very different ways of understanding pro-environmental behavior, Gatersleben and colleagues (2002) differentiated between the *intent-oriented approach*, using the individual's subjective perspective for defining pro-environmental behavior on the one hand, versus the *impact-oriented approach*, using an objective formula of translating our daily behaviors into more or less environmental impact, on the other hand.

Not only is environmental behavior varied and sometimes even contradictory in itself (see Bratt, 1999; Holland, Verplanken, & van Knippenberg, 2002). As will be further elaborated in Manuscript #2, it also seems to make intuitive sense that abstract attitudinal support and actual pro-environmental behavior are not always one and the same (Diekmann & Preisendörfer, 1998; Webb & Sheeran, 2006; but see Schahn & Bohner, 1993). While there is certainly a list of implications this differentiation has for the whole research area, for the current work it seems useful to highlight (a) the importance of being clear about what is being measured – attitudes or behavior or both – as well as the necessity of including measures for both whenever possible and appropriate, (b) the need for understanding that both variables might be systematically skewed in the population that is being studied (e.g., Henrich, Heine, & Norenzayan, 2010), and (c) investigating important constructs in the general public in order

to gauge the potential that these variables might have for interventions addressing this wider population. These aspects are reflected prominently in the current work, that (a) measures not only attitudinal variables (all chapters) but also actual behavior (Manuscript #1), and even estimates objective CO_2 emissions (Manuscript #2), (b) is critical about the selective sample's skewed readiness to report pro-environmental behavioral tendencies and show pro-environmental action (Manuscript #1), and (c) investigates and links core constructs in a representative sample (Manuscript #2).

After clarifying the two different technical approaches to (environmental) behavior (Bamberg & Rees, in press; Gatersleben et al., 2002), we shall now turn to two theoretical approaches to behavior. Namely, these are the social identity perspective on behavior and the collective action approach. As we will see, these lines of thought are both closely interrelated. In fact, individuals' actions on behalf of a certain group can obviously be partly motivated by their identification with that specific group.

"*[I]t is through others that we develop into ourselves.*"[5]

The social identity perspective

Social identity theory has been one of the most influential theories (if not *the* most influential theory) in social psychology over the last decades (Brown, 2000; Ellemers & Haslam, 2012; Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). The theory's basic assumption that we partly define ourselves through group memberships, and come to think, act, and feel as group members, has found considerable support (e.g., Ellemers, 2012; Ellemers, Spears, & Doosje, 2002; Leach et al., 2008; Smith, 1993). The

[5] Quote from Vygotsky, L. S. (1981). The genesis of higher mental functions. In J. V. Wertsch (Ed.), *The Concept of Activity in Soviet Psychology* (pp. 144-188). Armonk, NY: Sharpe. (p. 161)

concept of social identity, “that part of an individual’s self-concept which derives from his knowledge of his membership of a social group (or groups) together with the emotional significance attached to that membership” (Tajfel, 1974, p. 69) has consequently been linked with a variety of outcomes focusing on behaviors or attitudes that can be understood as occurring out of “group interest”, for example organizational commitment (Ellemers, De Gilder, & Haslam, 2004; Haslam, 2004), outgroup discrimination (Mullen, Brown, & Smith, 1992; Spears & Manstead, 1989; Tajfel & Turner, 1979), but recently also physiological variables such as selective brain activity (Scheepers et al., 2013). Our group memberships have even been conceptualized as a “social resource” (Correll & Park, 2005) and social identity has been linked with mental health outcomes, such as symptoms of post-traumatic stress disorder amongst descendants of Jewish Holocaust survivors (Wohl & van Bavel, 2011; see also Haslam, Jetten, Postmes, & Haslam, 2009; Jetten, Haslam, & Haslam, 2012).

From an environmental perspective, the concept of social identity is important because it can help us bridge the gap between “selfish”, short-term benefits (e.g., the decision to travel by plane because it is quick and convenient) and “altruistic”, long-term considerations (e.g., the decision to travel by public transportation because it will help protect the environment for future generations, even though it might be more tedious than taking the plane). Crucially, as will be elaborated further in Manuscript #3, the concept of social identity also offers an important link between individual perceptions of climate change and collective climate behavior by setting the stage for a model of collective climate action (e.g., engagement in a neighborhood-based climate protection initiative, demanding time and effort from individuals but benefitting the whole neighborhood in the long run). Importantly, in its original conceptualization, social identity theory was crafted as a theory of social change and hence “points to the fact that social psychological processes do not simply contribute to the

reproduction of the status quo, but also help to bring about change in the world" (Ellemers & Haslam, 2012, p. 393; Tajfel & Turner, 1979) – change that is needed in today's world.

In Manuscript #3, we will consequently see that individuals' intentions to engage in such collective action are partly rooted in perceptions of social norms as well as a group-based guilty conscience for the way humans are affecting the environment, with both of these, in turn, borne out of social identification with a relevant group, the neighborhood in this case. For the current work, the concept of social identity was not just included to pay homage to an influential social psychological line of thought. There are also important theoretical reasons as to why it is an interesting construct to acknowledge in any social psychological work in the realm of climate change; the engagement in collective action is a case in point.

"*If you want to go quickly, go alone.*
If you want to go far, go together."
– African proverb

Collective action

There is a rich theoretical basis and long tradition for social psychological research on collective action. Some argue that it can be traced back as far as to Le Bon's (1895) *The crowd* (e.g., Drury & Stott, 2012). In the context of social inequality, for example, "collective action is consistently described as the more effective way to reduce inequality and to establish social justice" (Becker & Wright, 2011, p. 63). Wright, Taylor, and Moghaddam (1990) define that a person engages in collective action "any time that she or he is acting as a representative of the group and the action is directed at improving the conditions of the entire group" (p. 995). Almost obviously then, much research has linked participation in collective action to the social identification with certain groups (Drury & Reicher, 2009; Klandermans,

1997; McGarty, Bliuc, Thomas, & Bongiorno, 2009; Stürmer & Simon, 2004; Van Zomeren, Postmes, & Spears, 2008). Research shows rather consistently that individuals' willingness to engage in collective action or even actual engagement in such action, for example protest on behalf of a certain group, is strongly dependent upon their social identification with that particular group. Famously, in a meta-analysis of 64 studies, Van Zomeren and colleagues (2008) found an averaged correlation of r = .38 between social identity and collective action.

Of course there are other factors co-determining if individuals engage in collective action. As will be discussed in more detail in Manuscript #3, the Social Identity Model of Collective Action (SIMCA) developed by Van Zomeren and colleagues (Van Zomeren et al., 2008; Van Zomeren, Postmes, Spears, & Bettache, 2011; Van Zomeren, Saguy, & Schellhaas, 2013) is currently the single most influential model in the field. Apart from the social identity pathway, SIMCA proposes two other pathways to collective action: the efficacy-pathway and the emotion-pathway, with social identity serving as a conceptual "bridge" between the two (Van Zomeren et al., 2008). Both pathways are themselves rooted in traditional research on efficacy beliefs (Bandura, 1997) and relative deprivation theory (Stouffer, Suchman, DeVinney, Star, & Williams, 1949), respectively. In exploring if and how the model can be adapted to the climate context, the concluding Manuscript #3 will demonstrate that SIMCA's focus on collective protest may have led to a neglect of other concepts and emotions that can be integrated into the model.

On the one hand, as outlined above, perceptions of social norms have long been established as important determinants of human behavior. Specifically in the environmental context, classic social psychological studies linked norms with behavioral intentions and actual behavior (Cialdini et al., 1990; Goldstein et al., 2008). It also makes intuitive sense that group norms, in turn, are influenced by social identification with these groups (Abrams &

Hogg, 1990; Terry & Hogg, 1996). The concept of social norms will thus be integrated into the model of collective climate action.

On the other hand, as also suggested above, guilt and shame should be prominent emotions when thinking about climate change. While they might not be as common as other emotions (such as worry, fear, and anger; Böhm, 2003), intriguingly they should be strongly linked with reparative behavioral intentions or even actual behavior (e.g., Allpress et al., 2010). As we will see in Manuscript #3, anger and outrage, traditionally linked with protest behavior (e.g., Iyer, Schmader, & Lickel, 2007; Tausch et al., 2011; Van Zomeren et al., 2008) do not qualify as predictors of collective climate action intention. But such behavior, which can be viewed as a specific form of reparative behavior, may be motivated by guilt and shame. This process will be demonstrated in an experimental study in Manuscript #1, in a correlational study in Manuscript #2, and finally Manuscript #3 will integrate the concept of group-based guilty conscience into the model of collective climate action.

The present research

The overarching aim of the current work was to piece together the seemingly disparate theoretical and methodological approaches outlined above into a comprehensive model of collective climate action. To reflect the aspiration of connecting lines of thought from diverse research areas as well as bringing together concepts across (sub-) disciplines, I will use the metaphor of a puzzle. Apart from summarizing each manuscript, I will also briefly highlight in which ways the respective work offers theoretical or methodological links with such other areas of research, i.e., in which ways it serves as connecting piece of the puzzle.

In Manuscript #1, we investigate individuals' basic emotional reactions when being confronted with environmental damages. We report one of few studies taking an experimental approach to this issue and draw on the literature on emotions in interpersonal and intergroup conflict. The study contributes to the literature by demonstrating that a guilty conscience (emotions of guilt and shame) translates into behavioral intentions as well as actual environmental behavior.

Building on the first manuscript, in Manuscript #2, we further investigate the links of "climate conscience" with objective environmental behaviors. Picking up on the different approaches to measuring behavior outlined above, we combine intent- and impact-oriented approaches and link objective estimates of actual CO_2 emissions with subjective guilty conscience. We demonstrate that the more objective CO_2 emissions individuals produce, the less willing they are to make concessions in the future or to engage in climate protection initiatives in their free time. At the same time, however, the study finds a general willingness to engage in collective climate action in our representative sample and identifies climate conscience as a potential driver of future pro-environmental societal change.

In order to facilitate and guide research on such pro-environmental societal change, in Manuscript #3, we develop a comprehensive model of collective climate action. The model

adapts the SIMCA to the environmental context. To operationalize social identification with the neighborhood, we use the concept of sense of community and the model integrates the first two manuscripts by introducing group-based guilty conscience as the emotional motivation for participation in collective climate action. Finally, we re-integrate and explicate the role of social norms for collective climate action.

Linking guilty conscience with behavioral intentions and actual behavior

Most studies investigating individuals' emotional reactions to anthropogenic climate change have been correlational (Böhm, 2003; Böhm & Pfister, 2000) or used only behavioral intentions as their main dependent variable (e.g., Ferguson & Branscombe, 2010; Harth et al., 2013; Mallett, Melchiori, & Strickroth, 2013; but see Mallett, 2012, Study 2). At least two preliminary conclusions can be drawn from these studies: First, perceived personal responsibility and the resulting emotions of guilt and shame for climate change will usually be low (Böhm, 2003). This seems plausible given that guilt and shame are aversive, self-critical emotions and individuals will therefore tend to avoid them. Second, if successfully elicited, moral emotions are reliably linked with pro-environmental behavioral intentions (Ferguson & Branscombe, 2010; Harth et al., 2013; Mallett et al., 2013). This latter finding seems encouraging but unfortunately goodwill does not automatically translate into actual behavior (e.g., Webb & Sheeran, 2006). In Manuscript #1, we therefore explore individuals' emotional reactions to being confronted with climate change, as well as subsequent behavioral intentions and actual behavior in an experimental design.

Drawing on the respective work in environmental psychology but also on recent theorizing and research on emotions, especially in intergroup conflict, we predicted that participants in our study would experience significantly stronger emotions when thinking about human-caused (experimental condition) versus seemingly naturally occurring environmental damages (control condition). More specifically, we expected that we would be

able to distinguish between general emotionality (emotional responses of sadness, anger, pride, emotional coldness) and a guilty conscience (guilt and shame), with the latter being particularly pronounced in the experimental condition. Regarding our outcome variables of pro-environmental behavioral intentions and actual behavior (signing a petition against plastic waste), we argued that only guilty conscience would translate into actual behavior.

As predicted, guilt and shame not only formed a separate "guilty conscience" in a factor analysis. Importantly, this variable also mediated the manipulation's effect on both behavioral intentions and petition signing, further documenting the potential of moral emotions in motivating real pro-environmental behavior. We also paint are more fine-grained picture of these emotions by introducing and investigating shame, an emotion that has traditionally been conceptualized as a "bad" emotion (Lewis, 1971). More recent theoretical (e.g., Deonna et al., 2011) and empirical work in the context of intergroup conflict (e.g., Allpress et al., 2014; Rees et al., 2013), however, has challenged this view. In fact, shame seems to be linked with prosocial, reparative intentions and behaviors as well, sometimes even more strongly so than guilt (for a review, see Gausel & Leach, 2011). The same was true in our study where shame was driving the manipulation's effect on our outcome variables.

Methodologically, this study is one of few examples we know of to measure real environmental behavior in an experimental design (see Mallett, 2012). Developing a theoretically-grounded, empirically validated manipulation to induce a guilty "climate conscience" not only allows for a test of its causal role in motivating eco-behavior. It might also prove useful for practitioners working in the field and aiming to motivate individuals to act in more environmentally friendly ways.

As illustrated in Figure 1, this first study was designed to connect guilty conscience with environmental behavior. It does so taking an experimental approach and drawing on the rich literature on intergroup conflict. Methodologically, therefore, it offers links with

experimental social psychology while, theoretically, linking the literature on environmental behavior with the literature on intergroup conflict.

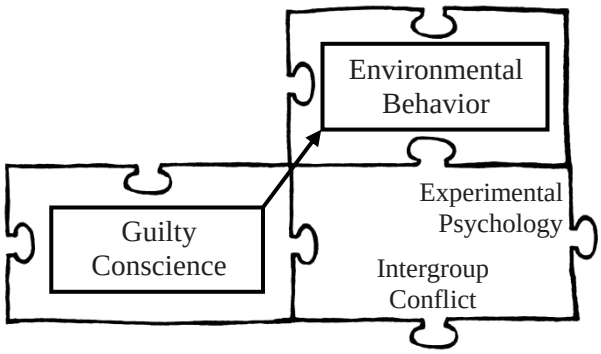

Figure 1. Parts of the puzzle pieced together in Manuscript #1.

Linking guilty conscience with objective CO_2 emissions in a representative sample

While the reliance on thoroughly controlled laboratory conditions is certainly a strength of Manuscript #1, it also limits the conclusions that can be drawn from the study. First, the behavior that was measured, petition signing, was at the "low cost"-end of the behavioral spectrum. Second, this behavior was shown under somewhat artificial conditions. And third, as common in experimental research, the sample consisted of university students, representing a highly selective sample. The study reported in Manuscript #2 was thus conducted to shed light on the prevalence and functioning of climate conscience in the general public. Measures were assessed under more natural conditions, and included psychological variables such as guilt, shame, and willingness to act environmentally friendly as well as everyday behaviors that could be converted into estimates of objective CO_2 emissions.

There have been successful attempts at linking subjective psychological measures with objective measures of actual household CO_2 emissions. For example, Nässén, Andersson, Larsson, and Holmberg (in press) found environmental concern and a perception of pro-

environmental norms to be negatively predictive of household greenhouse gas emissions. Others have linked values more generally with estimates of CO_2 emissions (e.g., Holden, 2004). It is important to stress that such statistical links are neither marginal nor trivial: If environmental psychology is to make a real contribution to the interdisciplinary discourse in the field, linking subjective psychological constructs with other, objective indicators is absolutely crucial. At the same time, estimates of actual CO_2 emissions are based on increasingly complex procedures making it virtually impossible for laypersons to realistically assess their own total CO_2 emissions without help. Accordingly, some studies have failed to find any links at all between environmental attitudes and actual environmental impact (e.g., Wilson, Tyedmers, & Spinney, 2013).

To clarify the relation between climate conscience and objective CO_2 emissions, we chose a combination of intent- and impact-oriented approaches for this study. Drawing on the results presented in Manuscript #1 and following the same rationale, we predicted a strong positive link between climate conscience and willingness to act. At the same time, we argued, a chronically guilty climate conscience would prevent people from behaving environmentally harmful in the first place. Consequently, we predicted a modest but negative link between objective emissions and willingness to act that would be mediated by climate conscience.

Converging with previous research in the field, the total amount of CO_2 emissions was generally predicted by socio-demographic variables such as age, gender, and education. Interestingly, while female participants consistently produced fewer emissions than male participants, the relations with other socio-demographic variables were more complex. Age, for example, was positively predictive of heating- and electricity-related CO_2 emissions but negatively predictive of food- and other consumption-related emissions. Around half of our sample reported that they would be willing to get involved in a climate protection initiative in their free time. Importantly, as predicted, we found a negative link between objective

emission-estimates and willingness to engage in environmentally friendly behaviors, which was mediated by a lack of guilty climate conscience.

Methodologically, the study contributes two important features to the overall puzzle, namely representative sampling and survey methods on the one hand and objective estimates of CO_2 emissions on the other hand. Linking it with objective CO_2 emissions in a representative sample is not only an important validation of the construct of climate conscience. It is also a crucial step forward in highlighting the potential contribution social and environmental psychology can make to a truly interdisciplinary discourse: Psychological variables such as climate conscience are not just abstract constructs, they are linked with concrete, objective CO_2 emissions. From a practical point of view, the study also helps to gauge the general public's willingness to engage in collective climate action, a matter that is further elaborated in the third and final manuscript.

Figure 2 illustrates this second study's purpose of linking guilty conscience with objective estimates of CO_2 emissions. The study therefore combines impact- and intent-oriented views on the correlates of guilty conscience. Methodologically, at the same time, the study diverges from standard laboratory research by using a representative sample.

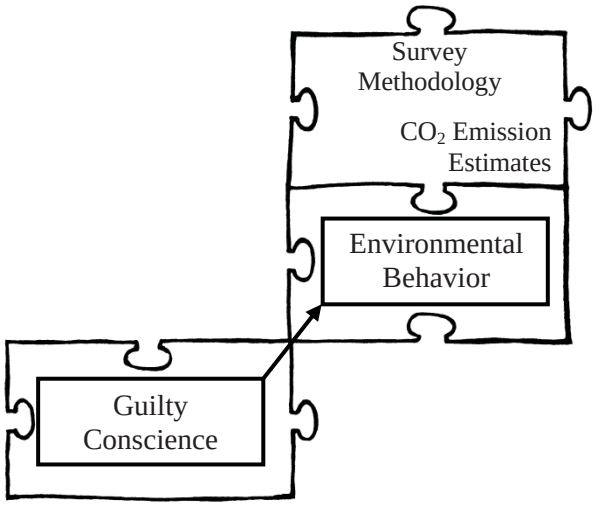

Figure 2. Parts of the puzzle pieced together in Manuscript #2.

Predicting individuals' willingness to engage in collective climate action

With both Manuscripts #1 and #2 focusing on the role of guilty conscience in motivating individual environmental behaviors, Manuscript #3 focuses on the role of guilty conscience in motivating collective behavior. It therefore integrates the construct into a wider theoretical model of collective climate action. More specifically, the target behaviors investigated in Manuscripts #1 and #2 were isolated, individual behaviors (signing a petition in Manuscript #1, individual CO_2 emissions in Manuscript #2, and mostly individual behavioral intentions in both studies). However, such individual behaviors might not be as effective in addressing the problem that climate change poses (e.g., Abrahamse, Steg, Vlek, & Rothengatter, 2005; Shove, 2010).

On a theoretical level and in another area of social psychology, the often implicit notion that "what happens inside our heads ultimately carries consequences at other levels of social reality" (Dixon, Levine, Reicher, & Durrheim, 2012, p. 418) has been challenged in favor of a collective action approach to social transformation. Real and sustained societal change, according to this approach, can only be achieved if individuals who disagree with the societal status quo form (new) groups and challenge the current state of affairs (Dixon et al., 2012; see also Wright, 2009; Wright & Baray, 2012). Following this approach, as outlined above, the SIMCA has become one of the most influential models guiding theorizing and research in the context of collective action. As such, it has been widely applied in the context of collective protest movements (e.g., Van Zomeren et al., 2008). Research investigating collective action in response to climate change, however, is still virtually absent (but see Van Zomeren, Spears, & Leach, 2010).

In Manuscript #3, we therefore develop an integrative theoretical model in order to conceptualize collective climate action in a realistic context. Our main dependent variable was individuals' willingness to engage in neighborhood-based climate protection initiatives and,

similar to Manuscript #2, we also collected data outside the laboratory using a combination of two convenience sampling strategies. Our main aim in Manuscript #3 was to develop a model of collective climate action. However, we also integrated insights gained in Manuscripts #1 and #2 by prominently embedding a guilty conscience as the emotional motivation for individuals to engage in such collective action. And finally, we re-integrated one of the constructs traditionally incorporated in models of human behavior and environmental behavior – the perception of social norms.

Following the logic of the SIMCA, we expected all three main constructs, collective efficacy beliefs, group-based emotions, and social identity to directly and simultaneously predict participants' intention to engage in collective climate action. However, we expected the latter's link with participation intention to be mediated by perceived social norms.

As expected and as demonstrated in previous research, the general model fit the data well: Social identification with the neighborhood was a direct predictor of participation intention but also of perceived collective efficacy and group-based guilty conscience, which were both, in turn, predictive of participation intention. All three variables explained a fair amount of variance in the criterion (R^2 = .18). However, when the perception of social norms was included in the model, the proportion of explained variance rose substantially (R^2 = .63). Apart from mediating the effect of social identification on participation intention, as predicted, the perception of social norms also emerged as the single strongest predictor in the final model. The emotional pathway to collective climate action was another important deviation from the standard SIMCA, as it was not anger but a guilty conscience significantly contributing to individuals' participation intention.

This latter finding might not come as a surprise given the results presented in Manuscripts #1 and #2. However, theoretically, it opens up the SIMCA for applications in other contexts by understanding the emotional motivations for individuals to engage in

collective action in a broader sense. Apart from collective protest on behalf of one's group, we argue, other forms of collective action can be motivated by other emotions as well. On another theoretical front, the model as we propose it re-integrates the well-established and long-standing research tradition on social norms (Ajzen, 1991). For practitioners working in the field, the construct of social norms should prove useful as it has been successfully manipulated in other contexts (e.g., Bohner, Pina, Viki, & Siebler, 2010; Perkins, Craig, & Perkins, 2011). Finally, for the current thesis, the study comes full circle by integrating the concept of guilty conscience into a genuinely social psychological model of societal change after excursions to the fields of intergroup conflict and objective CO_2 emission estimates.

The final study, as illustrated in Figure 3, was aimed to put the pieces of the puzzle together into a model of collective climate action. It consequently combines insights from the first two studies and complements them with the social identity approach to collective action and research on social norms. In this sense, the model developed and tested in this study is an integrative one. At the same time, the manuscript brings the literature on environmental behavior closer to the literature on collective action in order to develop a model of sustainable societal change.

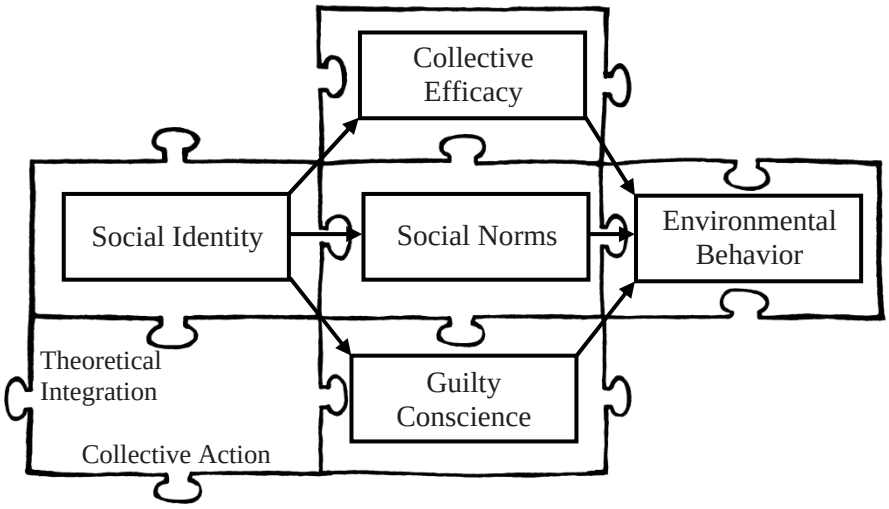

Figure 3. Parts of the puzzle pieced together in Manuscript #3.

Completing the puzzle

As mentioned above, in addition to the specific aim of developing a model of collective climate action, the overarching meta-theoretical aim of the current work is to highlight connections between research traditions and (sub-) disciplines. While the third and final manuscript completes the puzzle of collective climate action, all three manuscripts also provide connecting pieces to the overall puzzle, which is summarized in Figure 4.[6]

The first manuscript investigates individuals' basic emotional reactions under controlled laboratory conditions. Drawing on research in the area of intergroup conflict, the study identifies and demonstrates a guilty conscience to be the emotional motivation for participants to behave environmentally friendly. Guilty conscience is then validated with CO_2 emission estimates as an impact-oriented measure and using a representative sample in the second manuscript. By investigating the potential of guilty conscience for motivating engagement in the general public, the stage is set for our model of collective climate action. This model integrates the concepts that have been developed before within the framework of an established model of collective action that was originally developed in the protest context.

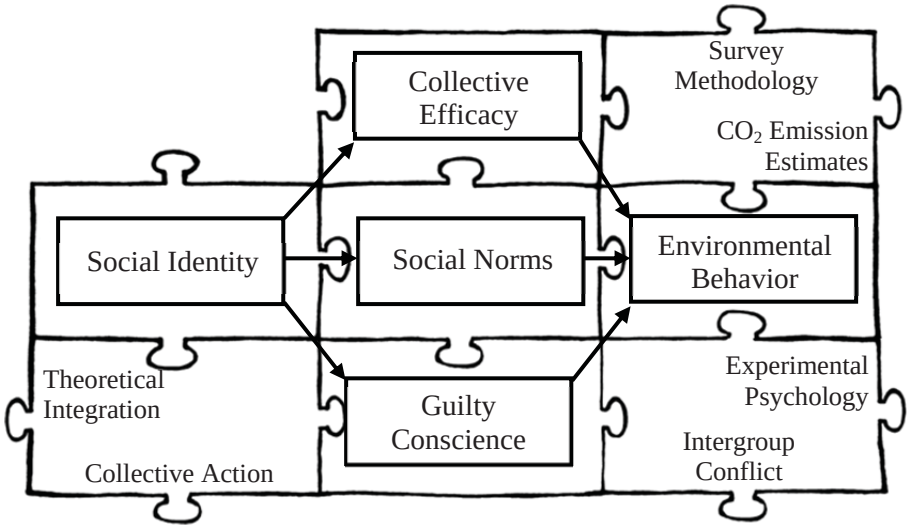

Figure 4. Parts of the puzzle pieced together in the current thesis.

[6] Reflecting another meta-theoretical conviction of the author, namely that theories can never be complete explanations of reality, one part of the puzzle is intentionally missing.

"*Revolutions are the locomotives of history*."
– Karl Marx

Conclusions and outlook: Toward a social psychology of societal change

Even though the current work focuses on the role of negative moral emotions in motivating individual and group-based pro-environmental behavior, its ambition goes beyond this topic. In fact, one of the basic principles of psychological research is to accumulate knowledge about universal rules and regularities of human behavior. In following this basic principle, the studies reported on the next pages not only draw on work from other areas of research but were themselves conducted to inform these research areas. Manuscript #1, for example, demonstrates basic mechanisms and outcomes of individuals' guilty conscience that can be extrapolated beyond the climate context. A guilty conscience after breaking one's mother's favorite porcelain vase, for example, should function in a similar fashion and lead to conceptually comparable reactions as a guilty conscience after pondering humans' negative effects on our planet's climate (Fontaine, Scherer, Roesch, & Ellsworth, 2007).

Why guilt and shame? On a group-level, guilt and shame for the way we treat our environment may motivate intentions to engage in collective climate action. In other contexts, these emotions have been linked with support for an apology to a harmed outgroup (Allpress et al., 2010), with more pro-social attitudes toward outgroups originally unrelated with a conflict (Rees et al., 2013), or with the intention to protest against ingroup policies (Iyer et al., 2007; Swim & Miller, 1999). But what about the (vicarious) guilt and shame that male individuals might experience when thinking about the way other men are treating women (Harth et al., 2008; Lickel, Schmader, Curtis, Scarnier, & Ames, 2005)? What about the guilty conscience people from a middle-class background may feel when confronted with inequality and unfairness in our society (Harvey & Oswald, 2000)? Ultimately, what about real

behavior, real societal change (Drury & Reicher, 2009)? The current work in general and the model of intention to engage in collective climate action that is developed in the closing manuscript of the current work in particular are construed in such a way that they should be readily adaptable to contexts other than collective climate action. In this sense, the model should apply to any situation where a certain social identity is linked with moral emotions in reaction to a status quo that is perceived as unfair or morally wrong. There is now ample evidence linking emotions of anger and outrage with the willingness to engage in collective protest (Iyer et al., 2007; Tausch et al., 2011). Yet, much research has focused on such behavior from the perspective of the group that is disadvantaged or treated unfairly (Van Zomeren et al., 2008, 2011). Any model aiming to explain real society-wide change, however, will by definition fail to do so if it excludes the perspective of the privileged or powerful group. To understand change, the multitude of reasons for individuals to challenge the status quo needs to be understood. As will be argued, self-focused moral emotions may be as effective in motivating change as other-focused moral emotions. While the latter are traditionally studied from the disadvantaged group's perspective in research on collective protest, the former should be more prevalent from the perspective of the advantaged group. Both perspectives need to be incorporated in a model of real societal change.

Why collective action? In recent discussions on the technical side of climate change, it is commonly underlined that the impact of individual behaviors pales in comparison with "big player-decisions" such as policy making or corporate sustainability commitments. In his 2007 Nobel Prize acceptance speech, Al Gore prominently argued that "[w]e must abandon the conceit that individual, isolated, private actions are the answer. They can and do help. But they will not take us far enough without collective action." Individuals' decisions to behave more environmentally friendly thus only yield significant measurable impact if enough

individuals commit to such behavior.[7] Apart from this pragmatic reason to introduce a collective action perspective in the current work, there is also a conceptual and historical reason: Collective action has traditionally been a motor of societal change.

Notwithstanding many particularities and differences, when we consider historical and more recent fundamental societal changes around the world, the common denominator seems to be that we are facing *collective* movements: the German anti-nuclear movement (Radkau, 2011), the Arab Spring (Blight, Pulham, & Torpey, 2012; Gelvin, 2012), the Occupy-movement (Pickerill & Krinsky, 2012; Van Stekelenburg, 2012). This apparent belief in bottom-up societal change seems to coincide with disbelief in top-down change as indicated by declining voter turnouts, for example in Europe (Banks, 2014) and the US, where it was the lowest since World War II in the 2014 midterms (DelReal, 2014).

What next? As the author of these lines, much of the research reported here is rooted in political and social psychology. It follows traditional and influential lines of thought in these areas – be it group-based emotions in intergroup conflict (Manuscript #1) or collective action (Manuscript #3). It also takes various methodological approaches – from experimental designs (Manuscript #1) and representative surveying (Manuscript #2), to the development of overarching theoretical models (Manuscript #3). Meta-theoretically, these features reflect the conviction that intra- and interdisciplinary exchange and a variety of research methods are needed if we are to contribute to the solution of important societal challenges of our times. Certainly, social psychologists have a lot to say about these issues but as Brown and colleagues (2012) assess “get listened to with only half an ear, if we get invited to the table at all” (p. 227). If we do not want to be viewed by future generations as “the science that fiddled whilst the planet burned” (Gifford, 2008, p. 278) it’s about time we make our voices heard.

[7] Johnson (2003) even suggests a philosophical argument that because “there is no reasonable expectation that individual, voluntary action will succeed” (p. 271) in stopping climate change, rather than changing individual behaviors, we are therefore ethically obliged to “focus our efforts in the political sphere, working for changes in the socio-economic structure that will change aggregate behavior” (p. 286; but see e.g., Hourdequin, 2010).

References

Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. (2005). A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology*, *25*, 273-291.

Abrams, D., & Hogg, M. A. (1990). Social identification, self categorization and social influence. *European Review of Social Psychology*, *1*, 195-228.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179-211.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Allpress, J. A., Barlow, F. K., Brown, R., & Louis, W. R. (2010). Atoning for colonial injustices: Group-based shame and guilt motivate support for reparation. *International Journal of Conflict and Violence*, *4*, 75-88.

Allpress, J. A., Brown, R., Giner-Sorolla, R., Deonna, J. A., & Teroni, F. (2014). Two faces of group-based shame: Moral shame and image shame differentially predict positive and negative orientations to ingroup wrongdoing. *Personality and Social Psychology Bulletin, 40*, 1270-1284.

Amelang, M., Tepe, K., Vagt, G., & Wendt, W. (1977). Mitteilung über einige Schritte der Entwicklung einer Skala zum Umweltbewußtsein [Report on some steps in the development of a scale of environmental awareness]. *Diagnostica, 23*, 86-88.

American Meteorological Society (2012). *Climate change: An information statement of the American Meteorological Society*. Retrieved from http://www.ametsoc.org/policy/2012climatechange.html

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*, 14-25.

Bamberg, S., & Rees, J. H. (in press). Environmental attitudes and behavior: Measurement. In J. Wright (Ed.) *International Encyclopedia of Social and Behavioral Sciences* (2nd ed.). Oxford, UK: Elsevier.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Banks, M. (2014). Voter turnout in May's European elections was lowest ever. *The Telegraph*. Retrieved from http://www.telegraph.co.uk/news/worldnews/europe/eu/11015823/Voter-turnout-in-Mays-European-elections-was-lowest-ever.html

Barnett, T. P., Adam, J. C., & Lettenmaier, D. P. (2005). Potential impacts of a warming climate on water availability in snow-dominated regions. *Nature, 438*, 303-309.

Becker, J. C., & Wright, S. C. (2011). Yet another dark side of chivalry: Benevolent sexism undermines and hostile sexism motivates collective action for social change. *Journal of Personality and Social Psychology, 101*, 62-77.

Becker, M. (2013). Globale Erwärmung: Studie über Klimawandel-Kriege stößt auf heftige Kritik [Global warming: Study on climate change-wars heavily criticized]. *Spiegel Online*. Retrieved from http://www.spiegel.de/wissenschaft/natur/klimawandel-studie-ueber-gewalt-anstieg-stoesst-auf-heftige-kritik-a-913966.html

Blake, J. (1999). Overcoming the 'value-action gap' in environmental policy: Tensions between national policy and local experience. *Local Environment, 4*, 257-278.

Blight, G., Pulham, S., & Torpey, P. (2012). Arab spring: an interactive timeline of Middle East protests. *The Guardian*. Retrieved from

References

http://www.theguardian.com/world/interactive/2011/mar/22/middle-east-protest-interactive-timeline

Böhm, G. (2003). Emotional reactions to environmental risks: Consequentialist versus ethical evaluation. *Journal of Environmental Psychology, 23*, 199-212.

Böhm, G., & Pfister, H. R. (2000). Action tendencies and characteristics of environmental risks. *Acta Psychologica, 104*, 317-337.

Bohner, G., Pina, A., Viki, G. T., & Siebler, F. (2010). Using social norms to reduce men's rape proclivity: Perceived rape myth acceptance of out-groups may be more influential than that of in-groups. *Psychology, Crime and Law, 16*, 671-693.

Bohner, G., & Schlüter, L. (2014). A room with a viewpoint revisited: Descriptive norms and hotel guests' towel reuse behavior. *PLoS One, 9*, e104086.

Borden, R. J., & Francis, J. L. (1978) Who cares about ecology? Personality and sex differences in environmental concern. *Journal of Personality, 46*, 190-203.

Bratt, C. (1999). Consumers' environmental behavior: Generalized, sector-based, or compensatory? *Environment and Behavior, 31*, 28–44.

Bray, D. (2010). The scientific consensus on climate change revisited. *Environment Science & Policy* 13, 340-350.

Brown, R., deVisser, R., Dittmar, H., Drury, J., Farsides, T., Jessop, D., & Sparks, P. (2012). Social psychology and policy-making: Past neglect, future promise. *Public Policy Research, 18*, 227-234.

Brown, R. (2000). Social identity theory: past achievements, current problems and future challenges. *European Journal of Social Psychology, 30*, 745-778.

Buhaug, H. (2010). Climate not to blame for African civil wars. *Proceedings of the National Academy of Sciences, 107*, 16477-16482.

References

Buhaug, H. (2014). Concealing agreements over climate-conflict results. *Proceedings of the National Academy of Sciences, 111*, E636.

Buhaug, H., et al. (2014). One effect to rule them all? A comment on climate and conflict. *Climatic Change, 127*, 391-397.

Burke, M. B., Miguel, E., Satyanath, S., Dykema, J. A., & Lobell, D. B. (2009). Warming increases the risk of civil war in Africa. *Proceedings of the National Academy of Sciences, 106*, 20670–20674.

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.

Clayton, S., & Brook, A. (2005). Can psychology help save the world? A model for conservation psychology. *Analyses of Social Issues and Public Policy, 5*, 87-102.

Correll, J., & Park, B. (2005). A model of the ingroup as a social resource. *Personality and Social Psychology Review, 9*, 341-359.

DelReal, J. A. (2014). Voter turnout in 2014 was the lowest since WWII. *The Washington Post*. Retrieved from http://www.washingtonpost.com/blogs/post-politics/wp/2014/11/10/voter-turnout-in-2014-was-the-lowest-since-wwii/

Deonna, J. A., Rodogno, R., & Teroni, F. (2011). *In defense of shame: The faces of an emotion*. NewYork: Oxford University Press.

Diamond, J. (2014). Top congressional Republicans slam U.S.-China climate deal. *CNN*. Retrieved from http://edition.cnn.com/2014/11/12/politics/senate-republicans-slam-us-china-climate-deal/

Diekmann, A., & Preisendörfer, P. (1992). Persönliches Umweltverhalten: Diskrepanzen zwischen Anspruch und Wirklichkeit [Personal eco-behavior: Discrepancies between

aspiration and reality]. *Kölner Zeitschrift für Soziologie und Sozialpsychologie, 44*, 226-251.

Diekmann, A., & Preisendörfer, P. (1998). Umweltbewußtsein und Umweltverhalten in Low- und High-Cost-Situationen: Eine empirische Überprüfung der Low-Cost-Hypothese [Environmental concern and environmental behavior in low- and high-cost situations: An empirical test of the low-cost-hypothesis]. *Zeitschrift für Soziologie, 6*, 438-453.

Dixon, J., Levine, M., Reicher, S., & Durrheim, K. (2012). Beyond prejudice: Are negative evaluations the problem and is getting us to like one another more the solution? *Behavioral and Brain Sciences, 35*, 411-425.

Drury, J., & Reicher, S. (2009). Collective psychological empowerment as a model of social change: Researching crowds and power. *Journal of Social Issues, 65,* 707–725.

Drury, J., & Stott, C. (Eds.) (2012). *Crowds in the 21st century: Perspectives from contemporary social science*. London: Routledge.

Dunlap, R. E. (1975). The impact of political orientation on environmental attitudes and actions. *Environment and Behavior, 7*, 428-454.

Ellemers, N. (2012). The group self. *Science, 336*, 848-852.

Ellemers, N., De Gilder, D., & Haslam, S. A. (2004). Motivating individuals and groups at work: A social identity perspective on leadership and group performance. *Academy of Management Review, 29*, 459-478.

Ellemers, N., & Haslam, S. A. (2012). Social identity theory. In P. A. M. Van Lange, A.W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of Theories of Social Psychology* (Vol. 2, pp. 379-398). Los Angeles: Sage Publications.

Ellemers, N., Spears, R., & Doosje, B. (2002). Self and social identity. *Annual Review of Psychology*, *53*, 161-186.

Emmott, S. (2013). *Ten Billion*. London: Penguin Books.

References

Ferguson, M. A., & Branscombe, N. R. (2010). Collective guilt mediates the effect of beliefs about global warming on willingness to engage in mitigation behavior. *Journal of Environmental Psychology, 30*, 135-142.

Ferguson, M. A., Branscombe, N. R., & Reynolds, K. J. (2011). The effect of intergroup comparison on willingness to perform sustainable behavior. *Journal of Environmental Psychology, 31*, 275-281.

Fielding, K. S., Hornsey, M. J., & Swim, J. K. (2014). Developing a social psychology of climate change. *European Journal of Social Psychology, 44*, 413-420.

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.

Fontaine, J. R. J., Scherer, K. R., Roesch, E. B., & Ellsworth, P. C. (2007). The world of emotions is not two-dimensional. *Psychological Science, 18*, 1050-1057.

Frijda, N. H., Kuipers, P., & ter Schure, E. (1989). Relations among emotion, appraisal, and emotional action readiness. *Journal of Personality and Social Psychology, 57*, 212-228.

Gatersleben, B., Steg, L., & Vlek, C. (2002). The measurement and determinants of environmentally significant consumer behaviour. *Environment and Behaviour, 34*, 335-362.

Gausel, N., & Leach, C. W. (2011). Concern for self-image and social-image in the management of moral failure: Rethinking shame. *European Journal of Social Psychology, 41*, 468–478.

Gausel, N., Leach, C. W., Vignoles, V. L., & Brown, R. (2012). Defend or repair? Explaining responses to in-group moral failure by disentangling feelings of shame, rejection, and inferiority. *Journal of Personality and Social Psychology, 102*, 941–960.

References

Gelvin, J. L. (2012). *The Arab Uprisings: What Everyone Needs to Know*. Oxford: University Press.

Gifford, R. (2008). Psychology's essential role in alleviating the impacts of climate change. *Canadian Psychology, 49*, 273-280.

Goldenberg, S., Taylor, L., & Branigan, T. (2014). US-China climate deal boosts global talks but Republicans vow to resist. *The Guardian*. Retrieved from http://www.theguardian.com/environment/2014/nov/12/us-china-climate-deal-boosts-global-talks-but-republicans-vow-to-resist

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.

Grasso, M., & Markowitz, E. M. (in press). The moral complexity of climate change and the need for a multidisciplinary perspective on climate ethics. *Climatic Change*.

Harrison, H. (1966). *Make Room! Make Room!* Garden City, NY: Double Day.

Harth, N. S., Kessler, T., & Leach, C. W. (2008). Advantaged group's emotional reactions to intergroup inequality: The dynamics of pride, guilt, and sympathy. *Personality and Social Psychology Bulletin, 34*, 115-129.

Harth, N. S., Leach, C. W., & Kessler, T. (2013). Are we responsible? Guilt, anger, and pride about environmental damage and protection. *Journal of Environmental Psychology, 34*, 18-26.

Harvey, R. D., & Oswald, D. L. (2000). Collective guilt and shame as motivation for White support for Black programs. *Journal of Applied Social Psychology, 30*, 1790-1811.

Haslam, S. A. (2004). *Psychology in organizations: The social identity approach* (2nd ed.). Thousand Oaks, CA: Sage Publications.

References

Haslam, S. A., Jetten, J., Postmes, T., & Haslam, C. (2009). Social identity, health and well-being: An emerging agenda for applied psychology. *Applied Psychology, 58*, 1-23.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*, 1-23.

Hines, J. M., Hungerford, H. R., & Tomera, A. N. (1986/87). Analysis and synthesis of research on responsible environmental behaviour: A meta-analysis. *Journal of Environmental Education, 18*, 1-8.

Holden, E. (2004). Towards sustainable consumption: Do green households have smaller ecological footprints? *International Journal of Sustainable Development, 7*, 44-58.

Holland, R. W., Verplanken, B., & van Knippenberg, A. (2002). On the nature of attitude-behavior relations: The strong guide, the weak follow. *European Journal of Social Psychology, 32*, 869-876.

Hourdequin, M. (2010). Climate, collective action and individual ethical obligations. *Environmental Values, 19*, 443-464.

Hsiang, S. M., & Burke, M. (2014). Climate, conflict, and social stability: What does the evidence say? *Climatic Change, 123*, 39-55.

Hsiang, S. M., Burke, M., & Miguel, E. (2013). Quantifying the influence of climate on human conflict. *Science, 341*, 1235367.

Hsiang, S. M., Burke, M., & Miguel, E. (2014). Reconciling climate-conflict meta-analyses: Reply to Buhaug et al.. *Climatic Change, 127*, 399-405.

Hsiang, S. M., Meng, K. C., & Cane, M. A. (2011). Civil conflicts are associated with the global climate. *Nature, 476*, 438-441.

Intergovernmental Panel on Climate Change (2013). *Climate Change 2013: The Physical Science Basis (Summary for Policymakers)*. Cambridge: Cambridge University Press.

References

Intergovernmental Panel on Climate Change (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects*. Cambridge: Cambridge University Press.

Iyer, A., Schmader, T., & Lickel, B. (2007). Why individuals protest the perceived transgressions of their country: The role of anger, shame and guilt. *Personality and Social Psychology Bulletin, 33*, 572–587.

Jetten, J., Haslam, C., & Haslam S. A. (Eds.) (2012). *The social cure: Identity, health and well-being*. London: Psychology Press.

Johnson, B. L. (2003). Ethical obligations in a tragedy of the commons. *Environmental Values, 12*, 271-287.

Kennedy, B. (Producer), & Miller, G. (Director). (1981). *Mad Max 2* [Motion picture]. Australia: Warner Bros..

Klandermans, B. (1997) *The social psychology of protest*. Oxford: Blackwell.

Kollmuss, A., & Agyeman, J. (2002). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research, 8*, 239-260.

Landler, M. (2014). U.S. and China reach climate accord after months of talks. *The New York Times*. Retrieved from http://www.nytimes.com/2014/11/12/world/asia/china-us-xi-obama-apec.html

Le Bon, G. (1895, trans. 1947) *The crowd: A study of the popular mind*. London: Ernest Benn.

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.

References

Lewis, H. B. (1971). *Shame and guilt in neurosis*. New York: International Universities Press.

Lickel, B., Schmader, T., Curtis, M., Scarnier, M., & Ames, D. R. (2005). Vicarious shame and guilt. *Group Processes & Intergroup Relations, 8*, 145-157.

Mallett, R. K. (2012). Eco-guilt motivates eco-friendly behavior. *Ecopsychology, 4*, 223-231.

Mallett, R. K., Melchiori, K. J., & Strickroth, T. (2013). Self-confrontation via a carbon footprint calculator increases guilt and support for a proenvironmental group. *Ecopsychology, 5*, 9-16.

Markowitz, E. M. (2012). Is climate change an ethical issue? Examining young adults' beliefs about climate and morality. *Climatic Change, 114*, 479-495.

Marzeion, B., Cogley, J. G., Richter, K., & Parkes, D. (2014). Attribution of global glacier mass loss to anthropogenic and natural causes. *Science, 345*, 919-921.

McGarty, C., Bliuc, A.-M., Thomas, E. F., & Bongiorno, R. (2009). Collective action as the material expression of opinion-based group membership. *Journal of Social Issues, 65*, 839-857.

Mullen, B., Brown, R., & Smith, C. (1992). Ingroup bias as a function of salience, relevance, and status: An integration. *European Journal of Social Psychology, 22*, 103-122.

Nässén, J., Andersson, D., Larsson, J., & Holmberg, J. (in press). Explaining the variation in greenhouse gas emissions between households. *Journal of Industrial Ecology*.

National Academies of Science. (2008). Understanding and responding to climate change. Retrieved from http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1048006.pdf.

Nolan, C. (Producer & Director), Thomas, E., & Obst, L. (Producers). (2014). *Interstellar* [Motion picture]. USA: Paramount Pictures and Warner Bros. Pictures.

Ojala, M. (2012). Hope and climate change: The importance of hope for pro-environmental engagement among young people. *Environmental Education Research, 18*, 625-642.

References

Onwezen, M. C., Antonides, G., & Bartels, J. (2013). The norm activation model: An exploration of the functions of anticipated pride and guilt in pro-environmental behaviour. *Journal of Economic Psychology, 39*, 141-153.

Oreskes, N. (2004). The scientific consensus on climate change. *Science, 306*, 1686.

Perkins, H. W., Craig, D. W., & Perkins, J. M. (2011). Using social norms to reduce bullying: A research intervention among adolescents in five middle schools. *Group Processes & Intergroup Relations, 14*, 703-722.

Pfister, H.-R., & Böhm, G. (2001). Decision making in the context of environmental risks. In C. M. Allwood & M. Selart (Eds.), *Decision making: Social and creative dimensions* (pp. 89-111). Dordrecht: Kluwer Academic Publishers.

Pickerill, J., & Krinsky, J. (2012). Why does Occupy matter? *Social Movement Studies, 11*, 279-287.

Radkau, J. (2011). Eine kurze Geschichte der deutschen Antiatomkraftbewegung [A brief history of the German anti-nuclear movement]. *Aus Politik und Zeitgeschichte, 46-47*, 7-15.

Rees, J. H., Allpress, J. A., & Brown, R. (2013). Nie wieder: Group-based emotions for in-group wrongdoing affect attitudes toward unrelated minorities. *Political Psychology, 34*, 387-407.

Reese, G., Loeschinger, D. C., Hamann, K., & Neubert, S. (2013). Sticker in the box! Object-person distance and descriptive norms as means to reduce waste. *Ecopsychology, 5*, 146-148.

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

References

Roach, J. (2013). Hot and bothered: Climate change amplifies violence, study says. *NBC News*. Retrieved from http://www.nbcnews.com/science/environment/hot-bothered-climate-change-amplifies-violence-study-says-f6C10817483

Rosenzweig, C., & Parry, M. L. (1994). Potential impact of climate change on world food supply. *Nature, 367,* 133-138.

Schahn, J., & Bohner, G. (1993). Aggregation oder Desaggregation? Einige Bemerkungen zur Debatte um die Ergebnisse von Diekmann und Preisendörfer [Aggregation or disaggregation? Some comments on the debate concerning the results of Diekmann and Preisendörfer]. *Kölner Zeitschrift für Soziologie und Sozialpsychologie, 45*, 772-777.

Scheepers, D., Derks, B., Nieuwenhuis, S., Lelieveld, G.-J., Van Nunspeet, F., Rombouts, S. A. R. B., & De Rover, M. (2013). The neural correlates of in-group and self-face perception: is there overlap for high identifiers? *Frontiers in Human Neuroscience, 7*:528.

Scheffran, J., Brozska, M., Kominek, J., Link, P. M., & Schilling, J. (2012). Disentangling the climate-conflict nexus: Empirical and theoretical assessment of vulnerabilities and pathways. *Review of European Studies, 4*, 1-13.

Schlenker, W., & Roberts, M. J. (2009). Nonlinear temperature effects indicate severe damages to U.S. crop yields under climate change. *Proceedings of the National Academy of Sciences, 106*, 15594-15598.

Schultz, P. W., Khazian, A., & Zaleski, A. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence, 3*, 4-23.

Seltzer, W., Thacher, R. (Producers), & Fleischer, R. (Director). (1973). *Soylent Green* [Motion picture]. USA: Metro-Goldwyn-Mayer.

References

Shove, E. (2010). Beyond the ABC: Climate change policy and theories of social change. *Environment and Planning, 42,* 1273-1285.

Smith, E. R. (1993). Social identity and social emotions: Toward new conceptualizations of prejudice. In D. M. Mackie & D. L. Hamilton (Eds.), *Affect, cognition, and stereotyping: Interactive processes in group perception* (pp. 297-315). San Diego, CA: Academic Press.

Spears, R., & Manstead, A. S. R. (1989). The social context of stereotyping and differentiation. *European Journal of Social Psychology, 19,* 101-121.

Stouffer, S. A., Suchman, E. A., DeVinney, L. C., Star, S. A., & Williams, R. M. (1949). *The American soldier: Vol. I Adjustment during army life*. Princeton: University Press.

Stürmer, S., & Simon, B. (2004). The role of collective identification in social movement participation: A panel study in the context of the German gay movement. *Personality and Social Psychology Bulletin, 30,* 263-277.

Swim, J. K., & Miller, D. L. (1999). White guilt: Its antecedents and consequences for attitudes toward affirmative action. *Personality and Social Psychology Bulletin, 25,* 500-514.

Swim, J. K., Markowitz, E. M., & Bloodhart, B. (2012). Psychology and climate change: Beliefs, impacts, and human contributions. In S. Clayton (Ed.) *The Oxford Handbook of Environmental and Conservation Psychology* (pp. 645-672). Oxford, UK: Oxford University Press.

Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information, 13,* 65-93.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of inter-group conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of inter-group relations* (pp. 33-47). Chicago: Nelson-Hall.

References

Tausch, N., Becker, J. C., Spears, R., Christ, O., Saab, R., Singh, P., & Siddiqui, R. N. (2011). Explaining radical group behavior: Developing emotion and efficacy routes to normative and nonnormative collective action. *Journal of Personality and Social Psychology*, *101*, 129-148.

Terry, D. J., & Hogg, M. A. (1996). Group norms and the attitude-behavior relationship: A role for group identification. *Personality and Social Psychology Bulletin, 22*, 776-793.

Thomas, C. D. et al. (2004). Extinction risk from climate change. *Nature, 427*, 145-148.

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 Stekelenburg, J. (2012). The Occupy movement: Product of this time. *Development, 55*, 224-231.

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.

Van Zomeren, M., Postmes, T., Spears, R., & Bettache, K. (2011). Can moral convictions motivate the advantaged to challenge social inequality? Extending the social identity model of collective action. *Group Processes & Intergroup Relations, 14*, 735-753.

Van Zomeren, M., Saguy, T., & Schellhaas, F. M. H. (2013). Believing in “making a difference” to collective efforts: Participative efficacy as a unique predictor of collective action. *Group Processes & Intergroup Relations, 16*, 618–634.

Van Zomeren, M., Spears, R., & Leach, C. W. (2010). Experimental evidence for a dual pathway model of coping with the climate crisis. *Journal of Environmental Psychology*, *30*, 339-346.

References

Webb, T. L. & Sheeran, P. (2006). Does changing behavioral intentions engender behaviour change? A meta-analysis of the experimental evidence. *Psychological Bulletin, 132,* 249-268.

Wilson, J., Tyedmers, P., & Spinney, J. E. L. (2013). An exploration of the relationship between socioeconomic and well-being variables and household greenhouse gas emissions. *Journal of Industrial Ecology, 17*, 880-891.

Wohl, M. J. A., & Van Bavel, J. J. (2011). Is identifying with a historically victimized group good or bad for your health? Transgenerational post-traumatic stress and collective victimization. *European Journal of Social Psychology, 41,* 818-824.

Wright, S. C. (2009). The next generation of collective action research. *Journal of Social Issues, 65*, 859-879.

Wright, S. C., & Baray, G. (2012). Models of social change in social psychology: Collective action or prejudice reduction, conflict or harmony. In J. Dixon & M. Levine (Eds.), *Beyond prejudice: Extending the social psychology of intergroup conflict, inequality and social change* (pp. 225-247). Cambridge UK: Cambridge University Press.

Wright, S. C., Taylor, D. M., & Moghaddam, F. M. (1990). Responding to membership in a disadvantaged group: From acceptance to collective protest. *Journal of Personality and Social Psychology, 58*, 994-1003.

Eigenständigkeitserklärung

Ich versichere, dass ich meine Dissertation “From guilty conscience to collective climate action: The role of negative moral emotions in motivating individual and group-based pro-environmental behavior” selbstständig und ohne unerlaubte Hilfe angefertigt habe und mich dabei keiner anderen als der von mir ausdrücklich bezeichneten Quellen und Hilfen bedient habe.

Die Dissertation wurde in der jetzigen oder einer ähnlichen Form noch bei keiner anderen Hochschule eingereicht, und hat noch keinen Prüfungszwecken gedient.

Bielefeld, Februar 2015 _____

(Jonas Rees)

Teile dieser Dissertation wurden oder werden in folgenden Fachzeitschriften publiziert oder befinden sich derzeit unter Begutachtung:

Rees, J. H., Klug, S., & Bamberg, S. (im Druck). Guilty conscience: Motivating pro-environmental behavior by inducing negative moral emotions. *Climatic Change*. DOI 10.1007/s10584-014-1278-x

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Rees, J. H., & Bamberg, S. (2014). Climate protection needs societal change: Determinants of intention to participate in collective climate action. *European Journal of Social Psychology*, *44*, 466-473. DOI 10.1002/ejsp.2032