

Article

The “I” and the “We” in Nature Conservation—Investigating Personal and Collective Motives to Protect One’s Regional and Global Nature

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Abstract: Personal pro-environmental action has often been explained in terms of personal cost-benefit analyses and personal capabilities. However, given that only collectives and not single individuals can effectively address large-scale environmental crises, such as mass extinction of species, peoples’ pro-environmental motivation might emerge from their perceived involvement in agentic collectives, as proposed in the social identity model of pro-environmental action (SIMPEA). Collective cognition and motivation (e.g., ingroup identification, ingroup norms, collective efficacy, and group-based emotion) might drive identified group members’ nature protection intention and behavior both directly and indirectly by affecting personal factors (e.g., personal attitudes). We tested this in two related nationally representative surveys of $N = 2065$ Germans, measuring both personal and collective predictors as well as nature protection intentions and behavior on either the regional or the worldwide, global level. As hypothesized, blockwise regression analyses suggest that collective factors affect people’s conservation action both directly and indirectly. In addition, participants’ identification with all humanity moderated the relationship between collective factors and personal intention (and personal norms) to protect global nature. Overall, the results support propositions of the social identity model of pro-environmental action and highlight the importance of collective factors motivating citizens’ conservation action.

Keywords: social identity; pro-environmental behavior; nature protection intention; nature protection behavior



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1. Introduction

Humankind is experiencing a variety of large-scale environmental crises, such as global climate change and the extinction of species [1–4]. Effectively tackling that kind of crisis requires collective efforts. Thus, for individual actors, environmental crises may cause feelings of personal helplessness [5] or the “rational” individual decision of free-riding (i.e., not contributing to a collective good, such as the atmosphere) [6]. Nevertheless, many individuals act against environmental crises in their everyday lives. This might be due to the fact that individuals often respond to large-scale environmental crises as representatives of social groups rather than individual actors. Thus, perceptions of *collective* environmental norms or *collective* efficacy to fight the crisis might govern people’s responses as much as personal cost-benefit analyses or personal capabilities do. In this article, we investigate the relative importance of collective and personal factors in predicting individuals’ nature conservation intentions and behavior and test the role of ingroup identification as a boundary condition for the impact of collective factors.

Environmental behavior research has typically explained individuals’ pro-environmental action in terms of *personal* cost-benefit-analyses [7] and personal morality [8]. However, as only collectives (but not single individuals) can be effective in tackling large-scale crises, personal beliefs in efficacy and personal action only make sense if people would consider

their individual behavior as being part of efficacious *collective* action. Various collectives could be relevant, such as the citizens of a city, a generation, or a nature conservation association. Whether or not people act should thus be determined by how they perceive and feel as members of their own collectives: Do they feel guilty as members of a collective that contributes to species extinction? Does the collective have pro-environmental norms and aims? Is the collective efficacious in addressing the environmental crisis? These perceptions may then affect individuals' environmental cognitions and morality as well as their intention to act [9]. In the present article, we test the effects of individual and collective determinants of nature conservation behavior in two related nationally representative samples of the German Nature Awareness Study 2017 [10].

1.1. Personal Determinants of Environmental Behavior

Individualist approaches to explain pro-environmental behavior have been integrated in the comprehensive action determination model (CADM) [8,11]. Specifically, the model integrates the theory of planned behavior [12], the norm-activation model [13,14], value-belief norm theory [15], and the habit approach [16] into one model of pro-environmental action.

Based on the theory of planned behavior [12], the CADM states that environmental behavior is a function of intentions and perceived behavioral control (the opportunity and ability to perform a certain behavior). Furthermore, habit strength [16,17] is considered to predict behavior. Intentions, in turn, are determined by attitudes (specific evaluations of the respective behavior), subjective norms (anticipated evaluation of the behavior by important individual others whom people are motivated to comply with), and perceived behavioral control.

The CADM proposes a personal norm (feeling morally obliged to perform a certain behavior) as a proximal predictor of intentions. This is derived from the norm-activation model [13,14] and value-belief norm theory [15]. However, these theories propose direct effects of personal norms on behavior and do not consider intentions as a mediator (see Bamberg & Möser [7]). Personal norms are, according to the CADM, themselves affected by several variables, including the awareness of consequences of environmental harmful behavior, the ascription of personal responsibility to act, and pro-ecological values, such as those expressed in the "new environmental paradigm" (see norm-activation model & value-belief norm theory). At the same time, the CADM proposes that perceived behavioral control and subjective norms (see theory of planned behavior) affect intentions via an indirect effect through peoples' personal norms.

1.2. The Role of Social Identity for Pro-Environmental Action

Many studies in the field of environmental psychology have investigated how personal level predictors may explain (pro-) environmental intention and behavior. Collective level predictors were often neglected in previous works. Only recently have systematic efforts been taken to describe the possible impact of collective thinking on pro-environmental action [9,18–21]. According to the social identity model of pro-environmental action (SIMPEA) [9], thinking in terms of one's own social identity, as a part of a larger social entity (as "we" instead of "I"), may motivate people to act pro-environmentally when considering the *collective* (vs. personal) impact to fight global environmental problems. Referring to social identity theory [22,23], social identity is defined as part of people's self-concept that derives from their knowledge of personal group-membership together with the value and emotional significance they attach to that membership [24]. SIMPEA proposes that identified members of a group should act in terms of that group membership. This happens when they perceive pro-environmental ingroup norms and goals (i.e., "in my group, pro-environmental action is common and appreciated and my group aims at protecting the environment") and collective efficacy to tackle an environmental problem (i.e., "through collective action we can significantly contribute to environmental protection.").

1.2.1. Group-Based Emotions

Group-based emotions such as guilt can arise from events that affect groups that people identify with [25]. Group-based emotions were found to enhance people's motivation to participate in pro-environmental collective action [26–28]. Ingroup guilt was found to enhance people's intentions to repair environmental damages [29], to drive pro-environmental behavior [30], and to increase support for pro-environmental groups [31].

1.2.2. Ingroup Norms

Group norms and goals give group members direction and purpose [9]. Social groups differ in the extent to which they are associated with pro-environmentalism. Whereas some social groups, such as “environmentalists”, are inherently linked to pro-environmental norms, others might not be, such as citizens of a country. The more group members perceive environmentalism to be normative for their group, the stronger their behavior should be directed towards pro-environmentalism. Group norms are either injunctive (perceptions of which behaviors are typically approved or disapproved of in a group) or descriptive (perceptions of which behaviors are typically performed; [32]). A host of previous studies found that ingroup norms have an impact on peoples' pro-environmental behavior. For instance, ingroup norms influence recycling behavior [33–36], the acceptance of electric vehicles [37], sustainable behavior [38], pro-climate behavior [39], or the reduction of towel use in hotels [40]. Of interest, the impact of norms seems to be largely unconscious, as people markedly underestimate how much their own behavior is affected by ingroup norms [37,41].

1.2.3. Collective Efficacy

Social groups differ in the (perceived) extent to which they are effective in pursuing and reaching collective goals, referred to as collective efficacy [42]. Collective efficacy was found to increase peoples' collective action intentions in studies on social movement participation [42]. At the same time, perceived effectiveness of their ingroup to reach pro-environmental goals enhanced people's willingness to act pro-environmentally. Thus, collective efficacy was found to affect private environmental actions as waste reduction and energy consumption [43], reduction of greenhouse gas emissions [44], electric vehicle use [36], and general pro-environmental behavior [45].

The effects of both ingroup norms and collective efficacy on pro-environmental action intentions should depend on the degree people identify with their ingroup. The effects are expected to be stronger for individuals with higher levels of identification [9].

1.3. The Present Research

The present research aims at assessing both the relative importance and the interplay of collective and personal variables in predicting people's nature conservation actions and sense of moral obligation. It is likely that both individual and collective predictors work in concert in driving individuals' pro-environmental action. Specifically, we propose that collective factors operate in both indirect and direct ways: collective factors, such as group-based guilt, ingroup norms, and collective efficacy should determine people's conservation action and moral obligation via affecting personal factors, such as personal problem awareness [11], conservation attitudes [46], or their personal efficacy perceptions [47]. At the same time, collective factors may shape group members' conservation action and moral obligation in a direct fashion, especially for those who are highly identified with the group [9]. That is, group members may engage in nature protection simply because they feel guilty as a group member and as they are convinced that typical group members do, aim to or are able to protect nature.

To test these hypotheses in the domain of nature conservation, we used two related representative population samples in Germany [10]. We measured all direct CADM and SIMPEA predictors of pro-environmental action, action intention (except habit because this nation-wide survey study served other purposes as well, and thus space was limited), and

personal norms (i.e., sense of moral obligation). These include attitudes, ingroup norms (from SIMPEA and as a version of the originally proposed “subjective norm” in CADM), as well as personal and collective efficacy. In addition, we measured people’s awareness of the natural environment as being threatened (i.e., problem awareness) and collective guilt that are conceived of as important indirect predictors in CADM or SIMPEA, respectively. Furthermore, we captured people’s identification with their ingroup of either people in their region or humanity, and their identification with the group of nature conservationists (as an ingroup, which is inherently linked to pro-environmental behavior).

Participants were randomly assigned to one of two different versions of the questionnaire. For half of the sample, the variables were measured regarding people’s regional nature, whereas the other half was asked about nature around the globe. The term “region” was not defined more narrowly. This allowed subjects to define “their” region for themselves. For some, this may have included their hometown, while for others it may have included a specific geographical unit such as a low mountain range. The questions on global nature referred to all nature on the planet.

Summarizing the above, we aim to investigate the following hypotheses and questions: (1) Collective factors (e.g., ingroup norms, collective efficacy perceptions) will have incremental predictive power for people’s conservation intentions as well as actual behavior beyond personal factors (e.g., personal attitudes, personal efficacy perceptions). (2) These collective factors affect people’s (a) personal norms, and (b) conservation intentions, and (c) actual behavior, both directly and indirectly through personal factors. (3) Whether the effects differ regarding peoples’ global and regional social identification will be explored.

2. Method

2.1. Participants and Design

Data were collected as part of the German “Nature Awareness Study 2017” by the Federal Agency for Nature Conservation. Standardized face-to-face interviews among a representative sample of 2065 German citizens were conducted. Upon random assignment, 1009 participants answered questions about nature conservation either on a global scale ($n = 1009$) or with regard to nature in their own region ($n = 1056$). The sample was selected according to sociodemographic characteristics. Age varied between 18 and 99 years ($M = 49.8$, $SD = 17.7$). A total of 51.2% of participants were female. Each interview lasted about 55 min. The questionnaire included various questions regarding the field of nature conservation (for more details see Bundesamt für Naturschutz [10]).

2.2. Procedure and Materials

Each variable was measured on the grounds of one, two, or three items, as space constraints prohibited more extended measurements. On a random basis, participants either received a questionnaire about global or regional nature conservation. Accordingly, ingroup measures either referred to people’s social identity as humans (in the global nature condition) or as people in their region (in the regional nature condition). We used three items of the Leach et al. (2008) ingroup identification scale measuring group-level self-investment ($\omega = 0.86$). This included measures of ingroup centrality (“The fact that I am part of humanity is an important part of my identity.”; all sample items are from the global ingroup version of the questionnaire), solidarity (“I feel a bond with humanity.”) and satisfaction (“Being a part of humanity gives me a good feeling.”). Furthermore, we used single items for each to measure the identification with nature conservationists (“I identify with the group of nature conservationists.”) and group-based guilt (“I feel guilty when I think about how we as humanity treat nature on Earth.”). Additionally, we measured collective efficacy perceptions by two items (“We as humanity are able to collectively engage in the protection of nature on Earth.”; “I believe that we as humanity are collectively able to succeed in protecting the nature on Earth.”; $r = 0.65$, $p < 0.001$). Furthermore, we assessed ingroup norms ($r = 0.58$, $p < 0.001$) with one prescriptive norm item (“In my opinion, a clear majority of humanity finds it important to do something for the protection of nature

on Earth.”) and one item on the descriptive norm (“In my opinion, a clear majority of humanity engages in the protection of the nature on Earth.”).

In addition, personal level predictors were assessed. We measured personal efficacy perceptions by using two items (“I am personally able to engage in the protection of nature on Earth.”; “I believe that I am personally able to succeed in protecting the nature on Earth.”); ($r = 0.67$, $p < 0.001$). Furthermore, we used single-item-measures to capture participants’ attitudes (“For me, only few things are more important than protecting the nature on Earth.”) and problem awareness (“For me, the manner in which people deal with the nature on Earth is extremely problematic.”). As a direct predictor of intention, we used a single-item-measure to capture participants’ personal norm (“I feel personally obliged to engage in the protection of nature on Earth.”). In addition, we used four items ($\omega = 0.80$) as a measure of participants’ intention to protect global nature. Two items measured the collective, activist, dimension of intention (“I am willing to take part in collective actions to conserve nature on Earth, e.g., demonstrations.”; “I would be willing to join a group for the protection of nature on Earth.”). Two other items measured the personal dimension of intention (“I am willing to personally do something for the protection of nature on Earth, e.g., attending to rules of conduct in nature conservation areas.”; “I would be personally willing to engage in the protection of nature on Earth, even if this means much effort, e.g., collecting waste out in nature once a week.”). For all measures, we used 5-point response scales from 1 (*not true at all*) to 5 (*fully true*). All items (except the behavior measure) were presented in random order. At the end of the questionnaire, we included a measure of actual behavior. All participants were asked whether they would agree to help in the evaluation of several booklets about the protection of nature on Earth that would serve to promote nature protection among lay people. We introduced this as a volunteering task which would have to take place right after the main interview and which would thus require additional, unpaid, time. People indicated the number of booklets they were willing to review on a 6-point scale from 0 to 5. Afterwards, the interviewers evaluated the extent to which the participants were convinced that they actually had to do the task from 1 (*not at all*) to 7 (*very*).

The other version of the questionnaire contained identical measures and items, except that the wording of the items referred to the group of “people of our region” protecting “the nature in our own region”. The single item measuring identification with nature conservationists was not adapted to global and regional nature conservation. Reliability analyses yielded satisfactory scale properties for the multiple-item measures (regional identification, $\omega = 0.87$; collective efficacy, $r = 0.65$, $p < 0.001$; ingroup norms, $r = 0.61$, $p < 0.001$; personal efficacy, $r = 0.67$, $p < 0.001$; intention, $\omega = 0.82$). For exploratory reasons, the questionnaire also included single-item-measures of identification with Germany and collective place identity. Details on exploratory results can be obtained from the first author.

3. Results

First, we conducted confirmatory factor analyses of all items thought to measure the proposed predictors of pro-nature intentions and behavior to test the assumed underlying structure of variables. Afterwards, using blockwise multiple regression analyses, we regressed personal norms, nature protection intentions, and behavior on the personal and collective level predictor variables, varying whether personal or collective factors were entered as the first block in the regression equation. Finally, we tested SIMPEA predictions on the interaction of social identity predictors. Specifically, we investigated whether ingroup norms and collective efficacy predict the DVs, especially for people highly identified with their group.

3.1. Confirmatory Factor Analyses

First, we conducted separate confirmatory factor analyses for the global and regional version of the questionnaire (for details see Tables 1 and 2). Overall, both analyses showed

that the assumed factor structure could be confirmed. For both questionnaire versions, the model fit was good.

Table 1. Factor loadings for global measures: Factors, items, estimates, standard errors, and *p*-values.

Factor	Item	Estimate	SE	<i>p</i>
Global Identification	The fact that I am part of humanity is an important part of my identity.	0.823	0.029	<0.001
	I feel a bond with humanity.	0.945	0.029	<0.001
	Being a part of humanity gives me a good feeling.	0.808	0.028	<0.001
Identification with Environmentalists	I identify with the group of nature conservationists.	1.171	0.026	<0.001
Collective Efficacy	We as humanity are able to collectively engage in the protection of nature on Earth.	0.645	0.025	<0.001
	I believe that we as humanity are collectively able to succeed in protecting the nature on Earth.	0.687	0.026	<0.001
Ingroup Norms	In my opinion, a clear majority of humanity finds it important to do something for the protection of nature on Earth.	0.780	0.037	<0.001
	In my opinion, a clear majority of humanity engages in the protection of the nature on Earth.	0.846	0.039	<0.001
Group-based Guilt	I feel guilty when I think about how we as humanity treat nature on Earth.	1.107	0.025	<0.001
Personal Efficacy	I am personally able to engage in the protection of nature on Earth.	0.848	0.032	<0.001
	I believe that I am personally able to succeed in protecting the nature on Earth.	0.930	0.032	<0.001
Attitudes	For me, only few things are more important than protecting the nature on Earth.	1.097	0.025	<0.001
Problem Awareness	For me, the manner in which people deal with nature on Earth is extremely problematic.	0.862	0.019	<0.001

Note. CFI = 0.97, TLI = 0.95, RMSEA = 0.06.

Table 2. Factor loadings for regional measures: Factors, items, estimates, standard errors, and *p*-values.

Factor	Item	Estimate	SE	<i>p</i>
Regional Identification	The fact that I am part of the people in my region is an important part of my identity.	0.781	0.027	<0.001
	I feel a bond with the people in my region.	0.900	0.027	<0.001
	Being a part of the people in my region gives me a good feeling.	0.787	0.026	<0.001
Identification with Environmentalists	I identify with the group of nature conservationists.	1.194	0.026	<0.001
Collective Efficacy	We as people in our region are able to collectively engage in the protection of our regional nature.	0.742	0.027	<0.001
	I believe that we as the people in our region are collectively able to succeed in protecting our regional nature.	0.782	0.028	<0.001
Ingroup Norms	In my opinion, a clear majority of the people in our region finds it important to do something for the protection of our regional nature.	0.816	0.031	<0.001
	In my opinion, a clear majority of the people in our region engages in the protection of our regional nature.	0.824	0.033	<0.001
Group-based guilt	I feel guilty when I think about how we treat nature in our region.	1.126	0.025	<0.001
Personal Efficacy	I am personally able to engage in the protection of nature in my region.	0.907	0.031	<0.001
	I believe that I am personally able to succeed in protecting the nature in my region.	0.933	0.031	<0.001
Attitudes	For me, only a few things are more important than protecting nature in my region.	1.172	0.026	<0.001
Problem Awareness	For me, the manner in which people deal with nature in my region is extremely problematic.	1.032	0.023	<0.001

Note. CFI = 0.99, TLI = 0.99, RMSEA = 0.03.

Tables 3 and 4 display descriptive information and intercorrelations for all of the relevant variables. They show small to moderate correlations between all personal and collective predictor variables.

Table 3. Correlation matrix for global measures, means and standard deviations.

	1	2	3	4	5	6	7	8	9	10	11
1 Ingroup identification	—										
2 Identification with nature conservationists	0.379 ***	—									
3 Collective efficacy	0.408 ***	0.372 ***	—								
4 Ingroup norms	0.313 ***	0.363 ***	0.332 ***	—							
5 Group-based guilt	0.331 ***	0.468 ***	0.308 ***	0.327 ***	—						
6 Personal efficacy	0.385 ***	0.503 ***	0.423 ***	0.414 ***	0.443 ***	—					
7 Attitudes	0.312 ***	0.432 ***	0.248 ***	0.384 ***	0.400 ***	0.438 ***	—				
8 Problem awareness	0.178 ***	0.275 ***	0.409 ***	0.192 ***	0.267 ***	0.315 ***	0.251 ***	—			
9 Personal norm	0.411 ***	0.554 ***	0.441 ***	0.431 ***	0.483 ***	0.654 ***	0.517 ***	0.389 ***	—		
10 Intentions	0.353 ***	0.588 ***	0.392 ***	0.321 ***	0.520 ***	0.607 ***	0.426 ***	0.341 ***	0.616 ***	—	
11 Behavior	0.233 ***	0.403 ***	0.268 ***	0.151 ***	0.365 ***	0.286 ***	0.273 ***	0.215 ***	0.328 ***	0.482 ***	—
Mean	3.80	2.93	4.17	3.37	3.22	3.34	2.99	4.13	3.45	3.13	2.55
N	1005	1004	1007	997	1003	1006	1003	1008	1004	1009	1009
SD	0.92	1.17	0.75	0.96	1.11	0.99	1.10	0.86	1.02	0.92	1.86

Note. *** $p < 0.001$, SD = Standard Deviation, N = Sample Size.

Table 4. Correlation matrix for regional measures, means and standard deviations.

	1	2	3	4	5	6	7	8	9	10	11
1 Ingroup identification	—										
2 Identification with nature conservationists	0.324 ***	—									
3 Collective efficacy	0.411 ***	0.438 ***	—								
4 Ingroup norms	0.384 ***	0.394 ***	0.513 ***	—							
5 Group-based guilt	0.240 ***	0.412 ***	0.256 ***	0.282 ***	—						
6 Personal efficacy	0.304 ***	0.562 ***	0.543 ***	0.515 ***	0.430 ***	—					
7 Attitudes	0.260 ***	0.438 ***	0.275 ***	0.375 ***	0.417 ***	0.499 ***	—				
8 Problem awareness	0.152 ***	0.230 ***	0.185 ***	0.126 ***	0.365 ***	0.312 ***	0.282 ***	—			
9 Personal norm	0.332 ***	0.565 ***	0.469 ***	0.514 ***	0.469 ***	0.681 ***	0.549 ***	0.313 ***	—		
10 Intentions	0.258 ***	0.559 ***	0.461 ***	0.379 ***	0.479 ***	0.695 ***	0.487 ***	0.365 ***	0.661 ***	—	
11 Behavior	0.195 ***	0.322 ***	0.270 ***	0.165 ***	0.317 ***	0.344 ***	0.194 ***	0.232 ***	0.342 ***	0.471 ***	—
Mean	3.88	2.83	3.79	3.36	2.78	3.15	2.74	3.30	3.16	3.03	2.58
N	1056	1050	1051	1041	1048	1056	1043	1040	1053	1056	1056
SD	0.88	1.19	0.86	0.95	1.13	1.03	1.17	1.03	1.12	0.99	1.84

Note. *** $p < 0.001$, SD = Standard Deviation, N = Sample Size.

3.2. Personal and Collective Predictors of Personal Norms, Intentions, and Behavior

For each of the two sub-samples (targeting global vs. regional nature), we assessed the effects of the personal and collective predictors on personal norms, intentions, and behavior. Personal and collective predictors were included blockwise in linear regression analyses in alternated order. That is, in one set of analyses we entered personal predictors as Block 1 and collective predictors as Block 2. In the other set, collective predictors were entered as Block 1 and personal predictors as Block 2. The results are displayed in Tables 5 and 6. Overall, when entered as Block 1, personal predictors explained 52% (global version) and 53% (regional version) of the variance in *personal norms* and 42% and 52% of variance in intentions. Collective level predictors, when entered as Block 1, explained 44% and 49% of the variance in personal norms and 45% and 43% of variance in intentions. For behavior, however, collective determinants explained more variance (20% and 16%) than the personal predictors did (12% and 13%) when each was entered as Block 1.

Table 5. Results of linear regression analyses: determinants of personal norms, intentions, and behavior (global version).

		Personal Norm			Intention			Behavior		
		Beta	<i>p</i>	R ²	Beta	<i>p</i>	R ²	Beta	<i>p</i>	R ²
Block 1 (Personal)	Personal efficacy	0.499	<0.001	0.522	0.454	<0.001	0.422	0.321	<0.001	0.117
	Attitudes	0.246	<0.001		0.147	<0.001		0.263	<0.001	
	Problem Awareness	0.204	<0.001		0.159	<0.001		0.278	<0.001	
	Collective efficacy	0.231	<0.001		0.164	<0.001		0.273	<0.001	
Block 1 (Collective)	Ingroup norms	0.182	<0.001	0.442	0.037	0.152	0.450	−0.016	0.011	0.204
	Global Identification	0.129	<0.001		0.054	0.050		0.054	0.421	
	Identification with Environmentalists	0.246	<0.001		0.300	<0.001		0.425	<0.001	
	Group-based guilt	0.182	<0.001		0.228	<0.001		0.359	<0.001	
Block 2 (Personal, Collective)	Personal efficacy	0.354	<0.001	0.574	0.298	<0.001	0.530	0.057	0.416	0.212
	Attitudes	0.166	<0.001		0.054	0.016		0.118	0.042	
	Problem Awareness	0.142	<0.001		0.092	<0.001		0.136	0.050	
	Collective efficacy	0.105	0.003		0.060	0.070		0.209	0.017	
	Ingroup norms	0.066	0.014		−0.037	0.145		−0.205	0.002	
	Global Identification	0.077	0.005		0.017	0.517		0.042	0.537	
	Identification with Environmentalists	0.129	<0.001		0.221	<0.001		0.378	<0.001	
	Group-based guilt	0.079	<0.001		0.162	<0.001		0.314	<0.001	

Note. All R²-increases significant with *p* < 0.001.

Table 6. Results of linear regression analyses: determinants of personal norms, intentions, and behavior (regional version).

		Personal Norm			Intention			Behavior		
		Beta	<i>p</i>	R ²	Beta	<i>p</i>	R ²	Beta	<i>p</i>	R ²
Block 1 (Personal)	Personal efficacy	0.584	<0.001	0.532	0.541	<0.001	0.520	0.534	<0.001	0.130
	Attitudes	0.253	<0.001		0.142	<0.001		0.004	0.947	
	Problem Awareness	0.073	0.004		0.134	<0.001		0.241	<0.001	
	Collective efficacy	0.176	<0.001		0.262	<0.001		0.330	<0.001	
Block 1 (Collective)	Ingroup norms	0.310	<0.001	0.485	0.080	0.009	0.426	−0.121	0.083	0.156
	Regional Identification	0.027	0.422		−0.050	0.101		0.100	0.152	
	Identification with Environmentalists	0.287	<0.001		0.271	<0.001		0.274	<0.001	
	Group-based guilt	0.235	<0.001		0.236	<0.001		0.336	<0.002	
Block 2 (Personal, Collective)	Personal efficacy	0.382	<0.001	0.593	0.414	<0.001	0.566	0.328	<0.001	0.180
	Attitudes	0.166	<0.001		0.096	<0.001		−0.090	0.113	
	Problem Awareness	0.042	0.081		0.096	<0.001		0.147	0.010	
	Collective efficacy	0.059	0.090		0.126	<0.001		0.209	0.010	
	Ingroup norms	0.172	<0.001		−0.044	0.111		−0.171	0.017	
	Regional Identification	0.027	0.364		−0.047	0.081		0.112	0.108	
	Identification with Environmentalists	0.148	<0.001		0.138	<0.001		0.204	<0.001	
	Group-based guilt	0.118	<0.001		0.116	<0.001		0.265	<0.001	

Note. All R²-increases significant with *p* < 0.001.

Given that personal and collective predictors are correlated (see Tables 3 and 4), and that they may thus affect each other, we were interested in the proportion of variance explained by uniquely personal and collective predictors when adding each of them as Block 2, respectively. Specifically, these analyses allow for gauging the extent to which collective factors affect conservation action in a *direct* way (considering the additional proportion of variance that is explained by collective predictors when controlling for personal factor effects) and in an indirect fashion, mediated through personal factors (considering how much controlling for personal predictors reduces the proportion of variance that is explained by collective factors). Adding the collective predictors (Block 2)

to multiple regression analyses on the personal predictors (Block 1) increased the total explained variance of personal norms by $R^2\text{change} = 0.05$ (global version) and 0.06 (regional version). For intentions, explained variance was increased by $R^2\text{change} = 0.11$ (global) and 0.05 (regional). For behavior, we found increases by $R^2\text{change} = 0.10$ (global) and 0.05 (regional). This speaks for collective factors having direct effects on personal norms, intentions, and nature protection behavior that are independent of *personal* determinants. At the same time, it seems that a considerable part of the collective factor effects is mediated through personal factors. This mediated path is larger for the prediction of personal norms and intentions and smaller for the prediction of actual behavior.

We also looked at possible unique effects of personal factors. When adding the personal predictors (Block 2) to regression analyses on collective predictors (Block 1), this increased explained the variance of personal norms by $R^2\text{change} = 0.13$ (global) and 0.11 (regional), of intentions by $R^2\text{change} = 0.08$ (global) and 0.14 (regional), and of behavior by $R^2\text{change} = 0.01$ (global) and 0.02 (regional). Obviously, while personal factors are of unique importance for predicting personal norms and intentions, here their unique effects on behavior seem very small.

Among the person-level predictors, *perceptions of personal efficacy* were the most important unique positive predictor of personal norms, intentions, and behavior, even when controlling for collective predictors. *Personal attitudes* towards nature protection predicted most outcomes as well, but to a markedly smaller extent. However, attitudes did not uniquely predict actual nature protection behavior in the regional condition. People's problem awareness uniquely predicted the dependent action variables, although possible effects seemed to be rather weak.

Three of the collective-level factors proved to be robust unique predictors of nature protection outcomes, even when controlling for other possible personal and collective predictors: collective efficacy, identification with environmentalists, and group-based guilt. *Perceptions of collective efficacy* in protecting nature uniquely predicted nature protection outcomes when controlling for other collective predictors. However, regression weights were markedly reduced when controlling for personal predictors as well (even becoming only marginally significant for predicting personal norms of protecting regional nature and intentions to protect global nature). This speaks to the possible indirect effects of collective efficacy mediated through changes in person-level cognitions. The same is true for the possible effects of people *identifying with conservationists*, with all effects remaining significant in all analyses. We found similar results for *group-based guilt*. However, when predicting actual nature protection behavior, the unique effects of group-based guilt were not markedly reduced when controlling for personal factors. Probably, the effects of collective guilt are not mediated through the personal factors measured in this study.

Even if ingroup norms show significant positive correlations with all variables (see Tables 3 and 4) when controlling for the other predictors in the multiple regression analyses, the effects sometimes disappear or even turn negative. This may indicate that ingroup norms act as a potential mediator, possibly transmitting the effects of other (collective) variables. For more details on the effects, see Tables 5 and 6.

3.3. Ingroup Identification as a Moderator

The social identity model of pro-environmental action (SIMPEA) [9] proposes that ingroup norms and collective efficacy affect pro-environmental action (intentions) most strongly for those people who are highly (vs. lowly) identified with the group (in this study, people in the region or all humanity). We tested this using the process macro in order to analyze multiple regression analyses with interaction terms [48].

As indicated in Table 7 and Figure 1, identification with global humanity indeed moderated the effects of ingroup norms and collective efficacy on personal norms and intentions. As predicted (although the interaction pattern of ingroup norm and ingroup identification is not significant for the prediction of personal norms), both ingroup norms and collective efficacy were more strongly associated with personal norms and intentions

for high than for low identifiers. However, we did not find moderating effects for regional identification (except for a marginal significant interaction for effects of ingroup norms on personal norms; see Table 7). As predicted, the simple slope patterns (see Figure 1) reveal that the effects of ingroup norms and collective efficacy on personal norms and intentions are stronger for highly than for lowly identified individuals.

Table 7. Moderation analyses: Unstandardized coefficients, standard errors, and *p*-values of interactions.

		Ingroup Norms × Ingroup Identification			Collective Efficacy × Ingroup Identification		
		Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>
Global	Personal Norm	0.038	0.029	0.192	0.084	0.037	0.024
	Intention	0.053	0.028	0.056	0.098	0.034	0.004
	Behavior	−0.148	0.059	0.012	0.113	0.074	0.127
Regional	Personal Norm	0.054	0.030	0.074	0.030	0.034	0.376
	Intention	−0.019	0.029	0.504	−0.006	0.031	0.843
	Behavior	−0.086	0.058	0.138	−0.092	0.062	0.138

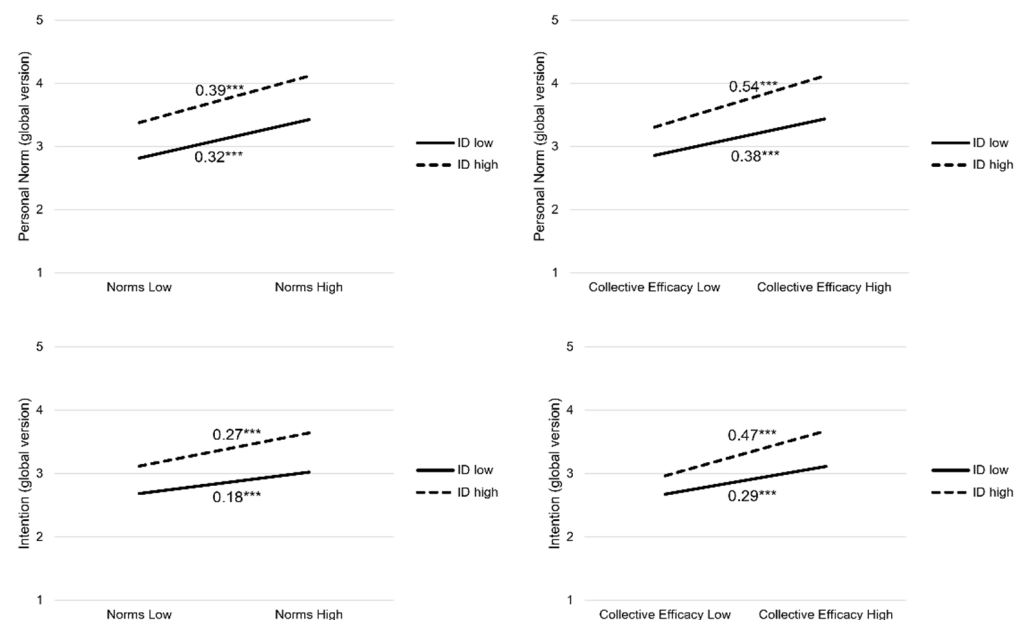


Figure 1. Effects of ingroup norms and collective efficacy on personal norms and intentions (global) for low (−1SD) and high identifiers (+1SD). Estimates and *p*-values (***) = *p* < 0.001). Note that the interaction of ingroup norms and identification on global personal norms is not significant (see Table 7).

For behavior, only ingroup norm effects were moderated by ingroup identification in the global nature protection condition (*p* = 0.012; there were no moderation effects in the regional nature condition). In contrast to our hypothesis, the simple slope pattern (see Figure 2) reveals that ingroup norms affect behavior for lowly identified individuals ($\beta = 0.30$, *p* < 0.001) but not for highly identified individuals ($\beta = 0.02$, *p* = 0.77).

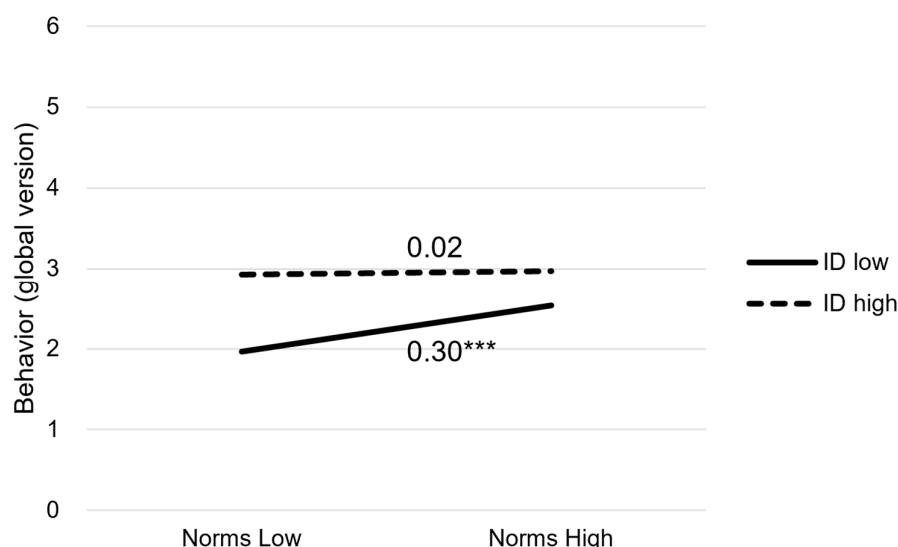


Figure 2. Effect of ingroup norms on global nature protection behavior for low ($-1SD$) and high identifiers ($+1SD$). Estimates and p -values ($*** = p < 0.001$).

4. Discussion

Adding collective cognition and motivation to the explanation of pro-environmental action expands our understanding of why people act in response to large-scale environmental crises, such as biodiversity loss, although a single individual cannot solve these crises. Thus, going beyond *personal* cost-benefit-analyses [7] and *personal* morality [8] to explain pro-environmental action, we investigated the impact of collective factors in parallel. As hypothesized, our results suggest that collective factors (i.e., collective efficacy, ingroup norms, ingroup identification, group-based guilt) affect people's conservation actions both in a direct and an indirect fashion. When entered as sole predictors, the collective factors explained up to 49% of variance in personal norms and intentions to conserve and up to 20% of variance in participants' actual conservation behavior. Personal predictors explained up to 53% and 13% of variance. Importantly, adding collective predictors to the equation further improved explained variance up to 11% and 9%. This is evidence for the unique impact of collective factor effects.

At the same time, we found support that collective factors affect people's conservation action *through* their impact on personal perceptions and attitudes, given that, first, collective and personal factors were all positively correlated and, second, the initial regression weights of collective efficacy, ingroup norms, ingroup identification, and group-based guilt were reduced when personal predictors were added to the regression equation. However, the fact that most of the regression weights of the single collective predictors remained significant even when controlling for personal factors suggests that collective factors did not only work through personal factors but contributed uniquely to the explanation of people's conservation action. Obviously, adding collective factors significantly improves our understanding of why people act in collective environmental crises. In line with SIMPEA [9,20], this suggests that pro-environmental action is not a (merely) personal decision. Instead, people may often refrain from pro-environmental action, as they do not conceive of themselves as being part of collectives that actively pursue the protection of nature and the natural environment (e.g., when existing collectives seem neither to care for the environment nor to be agentic). At the same time, conservation behavior should increase when people are supported in identifying with groups they perceive as pro-environmentally minded, active, and efficacious [20]. This will not only directly affect their intentions and behavior, but also their personal pro-conservation attitudes, perceptions, and sense of personal obligation which further drive personal conservation action. All collective factors were positively correlated with personal conservation norms, intentions,

and behavior. However, when controlling for the effects of the other collective (and personal) factors, ingroup norms had an unexpected unique effect on behavior. Whereas it positively predicted personal norms, it seemed to have a small negative effect on actual conservation behavior. As a possible explanation, ingroup norms of conservation may have different roles in directing group-based action. On the one hand, they might indicate that the group has shared goals (prescriptive norm) and is performing joint goal-directed action (descriptive norm), thus strengthening group-members' sense of collective agency and, thus, their motivation to act for the collective (conservation) goal. In fact, perceived ingroup norms were moderately correlated with participants' perception of collective efficacy, another indicator of collective agency [49]. On the other hand, high conservation norms in a population might signal to people that additional personal effort is not necessary, as others are already taking action. Stripping ingroup norms from their collective agency function, statistically, by controlling for shared effects with collective efficacy (i.e., the effects of collective agency), may uncover their detrimental effects on behavior through suggesting that personal conservation action is no longer necessary.

4.1. The Role of Ingroup Identification

For group-based processes to work, it is important that people identify with the group, which is predicted by SIMPEA [9]. The current study supports this prediction: ingroup norms and collective efficacy predicted conservation action for global nature more strongly for those participants who were highly (vs. moderately) identified with global humanity. When people identify highly with their ingroup, that group is highly relevant for their self-definition. Thus, group norms and efficacy perceptions guide their behavior to a higher degree when compared to low identifiers. This moderating effect has already been shown in previous studies. For instance, ingroup norms influence farmers to engage in sustainable practices, especially when they are highly identified with their community [38]. Masson and Fritsche [39] found that students adhered more strongly to pro- or anti-environmental ingroup norms when they were highly self-invested in the group.

The present results also extend the research on the effects of identification with all humanity [50]. Obviously, global identification is not only associated with higher levels of pro-social action and environmental protection intention. Beyond that, it seems to catalyze the pro-environmental effects of perceiving humanity as characterized by pro-environmental norms and as being efficacious in saving the planet.

It is worthy of note that, while ingroup identification catalyzed collective processes for those people who were made to think about *global* nature and humanity as the ingroup, we did not find those effects for people who were made to think about *regional* nature and the ingroup of people living in their region. From our point of view, different explanations seem viable. First, talking about "people living in your region" should make this group situationally salient and distinctive. Thus, particularly high *chronic* identification with that group is not required to catalyze the effects of collective variables. In contrast, humanity and "nature on earth" is not very distinct as a social ingroup (given its high level of inclusiveness and the missing of relevant outgroups), and thus mentioning it should not make identity as a human particularly salient. Thus, in this case, chronic identification with the ingroup *humanity* should more strongly determine whether social-identity processes take place or not. Secondly, when people are made to think about regional nature protection, they may think about relevant others being active in the field of nature conservation. For instance, they may think about local foresters or their children taking part in local protests (e.g., Fridays for Future). This may also shape feelings of collective efficacy or (subjective) norms, which transfer into nature protection intentions without identification with the whole region being necessary. Finally, identification with humanity might be more strongly associated with valuing nature compared to people's regional identification. It is possible that this further enhanced the moderating effects in the global identity group. In fact, several studies found that global identification is inherently linked to pro-environmental attitudes and behavior [51–54].

In contrast to our initial assumptions, the association of perceived global ingroup norms and actual behavior to protect global nature only existed for low and not for high identifiers. Instead, high identifiers' behavior scores always exceeded those of low identifiers, irrespective of whether they perceived ingroup norms to be high or low (see Figure 2). The behavioral measure included the evaluation of several nature booklets that were said to be used to promote nature conservation to lay people. This was introduced as a volunteering task which would take about 5 min per booklet. Participants could decide to evaluate between zero and six booklets. It is possible that the burden to evaluate up to six booklets was set too high, and evaluating three booklets was the maximum that participants considered feasible after having already been interviewed for 55 min. In this case, the non-existent norm effect in high identifiers can be attributed to the extreme difficulty of the upper expressions of the behavior measure (ceiling effect).

4.2. Conclusions

The purpose of the present study was to test the relative importance and the interplay of collective and personal variables in predicting peoples' nature conservation actions and sense of moral obligation. Furthermore, we wanted to test SIMPEA [9,20] in a comprehensive fashion, including all primary collective factors that are assumed to affect individuals' pro-environmental behavior. Therefore, we used nationally representative (sub-) samples and investigated social identity processes in the context of two different social identities (regional vs. global ingroup), strengthening the validity of the results. As a limitation, the correlational nature of the study warrants caution in the causal interpretation of the results. Although previous experimental studies have demonstrated causal effects of single collective factors, particularly ingroup norms [9,20], experimental evidence is still underdeveloped for the effects of ingroup identification [55] and collective efficacy and agency [49]. The present study further supports the important role of ingroup identification and collective efficacy for pro-environmental action. However, more experimental and longitudinal research is required to gauge the causal effects of these collective factors and, importantly, their interplay.

Our findings offer a range of practical implications with regard to the success of the socio-ecological transformation of societies. At the core stands the insight that people's personal acceptance and support of nature protection and societal transformation strongly depends on the creation of nature protection as a collective project. Specifically, a collective project representation should emerge from large collectives that people identify with, that stand for the shared norm and the goal of protecting nature, and that prove to be agentic entities (e.g., social movements) instead of just descriptive categories. Creating and supporting agentic collectives might be achieved through enabling and communicating joint pro-environmental goals, activities, and successes of citizens of a state, a generation, or an environmental movement [49]. Such an endeavor seems to be most promising when a collective project is intrinsically related to the group that claims autonomous ownership of its specific environmental protection goals (as it is expressed in projects, such as the "European New Green Deal", the "German Energiewende" [energy transformation], the young generation's "School Strikes for Climate", or "Scientists for Future"). A growing number of studies show promising results in this regard. For instance, Jans (2021) [56] found that perceiving a pro-environmental initiative as formed by regular group members themselves (i.e., from the bottom up) enables pro-environmental social identity formation, which motivates pro-environmental behavior accordingly. In two intervention studies, it was demonstrated how building social norms and social identification or strengthening collective efficacy beliefs could enhance both residential water conservation [57] as well as adolescents' pro-environmental behavior intentions [58].

As our findings suggest, nature protection intentions and conservation behavior are to a large extent based on people's self-definition as members of social groups. This supports a social identity perspective on environmental action, and for the first time applies this collective perspective to the domain of nature protection behavior. It is obvious that the

human capacity to think and act in terms of “We” instead of “I” may encourage optimism about humankind being able to solve the exceptional global environmental crises of our time. At the same time, this optimism requires people to organize in, and identify with, collectives who feel the urgency to protect nature, who rally around that collective goal, and who make visible efforts in a world at the crossroads of doom and hope.

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