

Collective climate action: Determinants of participation intention in community-based pro-environmental initiatives



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ABSTRACT

There seems to be consensus that apart from individual behavioral change, system-wide transformations are required to address the challenges posed by climate change. Collective action is viewed as one core mechanism in social transformation but there is currently no systematic research on collective climate action. By reviewing theoretical perspectives and models explaining collective protest, we aim to provide a starting point for such a research program. Based on correlational data from a student sample ($N = 652$), a sample of participants of a local climate protection initiative ($N = 71$), and visitors of a climate protection event ($N = 88$), we tested constructs derived from these theoretical models. Social identity, perceived behavioral control, and participative efficacy beliefs consistently predicted substantial amounts of variance in participation intention. Implications for future research are discussed, such as recognizing the interplay between cost-benefit calculations and social identity, or temporal dynamics in collective action engagement.

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1. Introduction

Over the last decades, environmental psychology has explored psycho-social determinants of individual pro-environmental behavior. This knowledge is of high practical value: It provides practitioners with a solid theoretical foundation for developing social marketing campaigns aiming to promote behavioral change in domains such as mobility, home energy use, and nutrition. A number of evaluation studies demonstrate that social marketing campaigns based on psychological theorizing can effectively change the targeted behaviors (e.g., Abrahamse, Steg, Vlek, & Rothengatter, 2005; Michie, Whittington, Abraham, & McAteer, 2009; Möser & Bamberg, 2008). On the other hand, however, there is also growing skepticism whether an approach focusing on changing individual behaviors alone will achieve the degree of change required for the transformation toward a more sustainable society (e.g., Peattie & Peattie, 2009). Shove (2010), for example, argues that such an individualistic approach is essentially flawed

because it does not take into account the infrastructural frame conditions and “social practices” of a society facilitating or impeding individual pro-environmental behavioral change. This critique is in line with research in ecological economics claiming that apart from individual behavioral change, system-wide transformations are required to initiate the move to a low-carbon economy (e.g., Jackson, 2009; Seyfang, 2009). Thus instead of focusing on changing individuals' consumption behavior, these researchers suggest investigating how, when, and why people take *collective action* aiming to engage in sustainable production and consumption patterns.

A prominent example of emerging community-based collective action initiatives is the Transition Towns (TT) movement (www.transitiontowns.org; Hopkins, 2008). It aims at mobilizing community action and fostering public empowerment and engagement around climate change, with the objective of bringing about a transition to a low-carbon economy. TT initiatives pursue many locally-based activities which aim to reconfigure social practices around energy consumption, for example establishing locally-owned renewable energy companies, promoting locally-grown food, encouraging energy conservation, exemplifying low-carbon living, and building supportive communities around these

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activities. In the present paper, we draw on TT and an initiative for “local energy autonomy” as examples to illustrate the psychological drivers of collective action for sustainability.

2. The present paper

Little is currently known about the motives underlying a person's decision to actively participate in an initiative such as TT groups (but see Rees & Bamberg, 2014; Van Zomeren, Spears, & Leach, 2010). The present paper therefore aims to provide a theoretical basis for a research program on collective action in the sustainability domain. Beginning with Le Bon's (1895) analysis of crowd behavior, social sciences have explored the motives and processes underlying collective action for over a century. We begin the theoretical part of the current paper by offering a definition of collective action. To contextualize the lines of thought that we are drawing on for the current work, we then review four theoretical approaches identified in the literature exploring the individual motives to engage in collective action (Section 3.). Before this background, in the next section we then outline three models of collective action that integrate the four motivational “pathways” to collective action in different combinations (Section 4.). Most of this research relates to collective action against social injustice and discrimination and has consequently been tested exclusively in these domains. We therefore discuss how these models may be adapted to the field of environmental psychology where appropriate. In the empirical part of the paper, we apply the three models to predict the intention to participate in TT initiatives reported by a student sample (Study 1), the intention to participate and actual participation in meetings discussing and preparing “local energy autonomy” by a sample of citizens living in a small village (Study 2), and collective climate action intention reported by green activists visiting a talk given by Rob Hopkins, the founder of the TT movement (Study 3). We compare the different models to test which of them best applies to collective climate action and which adaptations might be needed to increase the predictive accuracy of the models. In this model comparison, we find empirical support that participative efficacy beliefs, perceived behavioral control, and especially social identity are the most relevant drivers of collective climate action. The paper's final part summarizes the results and discusses their implications for future research (Section 9.).

3. Definition of and four pathways leading to collective action

Wright, Taylor, and Moghaddam (1990, p. 995) provide a definition of collective action that can be considered exemplary for the current literature: “a group member 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”. This definition views collective action as a group behavior that is motivated by a member's desire to improve the position of his or her in-group. Collective action can take many forms, ranging from non-violent actions such as taking part in peaceful demonstrations, signing petitions, or participating in acts of civil disobedience, to more radical forms such as sabotage and violence. There is, by now, a rich literature on the social psychology of collective protest. Various authors (Haslam, 2001; Klandermans, 1984, 1997; Stürmer & Simon, 2004; Van Zomeren, Postmes, & Spears, 2008) have distilled from this literature the four most influential “pathways” to collective action that we will summarize next.

3.1. The cost-benefit pathway

This pathway is based on Olson's (1965) assumption that people calculate the costs and benefits of a particular action and then try to

maximize their subjective utility. This assumption essentially frames collective action as a social dilemma: Whereas everybody may profit from the benefits of successful collective action (e.g., lower tuition fees in the case of student protest movements), the costs of participation have to be borne by individuals. A strictly rational actor would hence do nothing and wait for others to take care of the collective action (“free-riding”). For Olson (1965), active participation in collective action is more likely if it is associated with benefits only obtainable through participation. Klandermans (1984) extends this line of thought and specifies three “selective” motives for collective action: The *collective motive* captures the benefit of the collective action goal for the individual (e.g., equal rights), and the individual's expectation that collective action will achieve this goal. The *normative motive* represents the individual's assessment of what significant others think about collective action and his or her own expectation that they will approve or disapprove of collective action (e.g., ridicule or admiration by friends or family). The *reward motive* covers individual costs and benefits of collective action (e.g., losing money or time or having a good time with friends). Empirically, Stürmer and Simon (2004) report unique contributions of all three motives to the prediction of collective action participation intention.

3.2. The collective efficacy pathway

Resource mobilization theory (McCarthy & Zald, 1977) assumes that social protest constitutes a set of rational actions by groups to advance their collective interests, pressuring those in power to submit to the demands of the aggrieved. At the beginning, research on resource mobilization focused mainly on objective resources (e.g., number of group members, financial support) promoting the formation and organization of social movements. However, empirical research soon indicated that the group's objective resources are less important than the individual actors' subjective perceptions that the group as a whole is able to successfully organize and conduct collective actions. This subjective sense of available resources is termed *collective efficacy*, referring to expectations that one's group is able to achieve social change through collective action (Bandura, 1997; Mummendey, Kessler, Klink, & Mielke, 1999). The higher the perceived collective efficacy, the more people should be motivated to participate in collective action. Van Zomeren and colleagues' (2008) meta-analysis reports an averaged random effect correlation (53 studies) between collective efficacy and collective action of $r_+ = .34$ (95% CI = .29–.39).

3.3. The group-based emotions pathway

This pathway focuses on how taking collective action can regulate group-based emotions, e.g., anger resulting from unfair collective disadvantage. Relative deprivation theory (Walker & Smith, 2002) suggests that the affective component of perceived deprivation predicts collective action intentions better than the cognitive component (Dubé-Simard & Guimond, 1986). According to this approach, individuals first appraise whether their disadvantage is group-level, then appraise whether the group disadvantage is fair, legitimate, and just. Appraising the collective disadvantage negatively evokes group-based anger, and motivates individuals to take collective action. Van Zomeren et al. (2008) report an averaged correlation (65 studies) between group-based negative emotions and collective action of $r_+ = .35$ (95% CI = .30–.39).

3.4. The social identity pathway

From the perspective of social identity theory (Tajfel & Turner,

1979), collective action represents behavior as a group member. A strong sense of collective identity is therefore necessary for group members to engage in collective behaviors aimed at improving their in-group's situation. Based on a total of 64 studies, Van Zomeren et al. (2008) report in their meta-analysis an averaged random effect correlation between group members' identification with the in-group and collective action participation of $r_+ = .38$ (95% CI = .33–.42). Simon and Klandermans (2001) further differentiate in identification with the disadvantaged group from which the social movement typically recruits its members as well as identification with the social movement itself. In the second identification process, the movement's norms, interests and goals become self-defining, resulting in an "inner obligation" to become actively involved. The authors show that the latter form of identification is a much stronger predictor of collective action participation than the former (Simon & Klandermans, 2001).

3.5. Different contexts: implications for the current research program

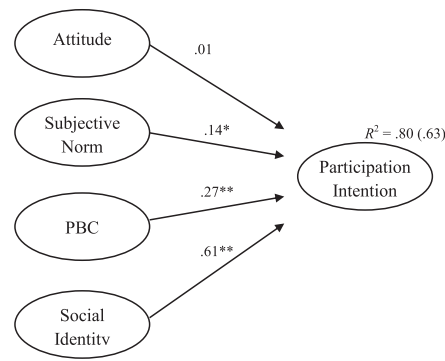
In the social injustice domain, collective action is tied to a group's struggle for relative status. In contrast, in the climate protection domain, the goal is not to improve the in-group status relative to an out-group, but rather to convince as many non-members as possible to join the group and to agree with the group's normative worldview. Wright (2009) describes these different social movement goals as different representations of the out-group: Whereas *competitive collective action* draws a clear boundary between "us" and "them", *conversionary collective movements* aim to convert "them" into one of "us". Competitive collective action may be more strongly associated with negative emotions like anger and resentment, whereas conversionary collective action may require a more compassionate view of the out-group. In conversionary collective action, the in-group may be better described as "opinion-based group" (McGarty, Bliuc, Thomas, & Bongiorno, 2009). This concept is based on the idea that people can use opinions (e.g., about the dangers of climate change) as the basis of psychological self-definition, just as they could with any other psychologically meaningful social category.

4. Three integrated models of collective action participation proposed in the literature

Nevertheless, within the domain of collective climate action, the significance of the four pathways outlined above has yet to be tested explicitly. To do so, we compare three integrated models of collective action participation put forward in the literature. The three models will be presented in the next section and already foreshadow that the four "pathways" should be considered complementary rather than competing explanations of collective action participation since they integrate the pathways in different combinations. As the four pathways, the three models have also exclusively been tested in the context of collective protest.

4.1. The dual-pathway model of collective action

This model combines the cost-benefit and social identity pathways. Developed by Stürmer and Simon (2004, see Fig. 1), the dual-pathway model operationalizes the cost-benefit pathway via Klandermans' (1984) triad of collective, normative and reward motives. Each of these motives is conceptualized as a multiplicative function of a value and expectancy component. Connecting to Ajzen and Fishbein's (1980) theory of reasoned action, the collective motive and the reward motive co-determine the attitude toward participation in social movement activities, whereas the normative



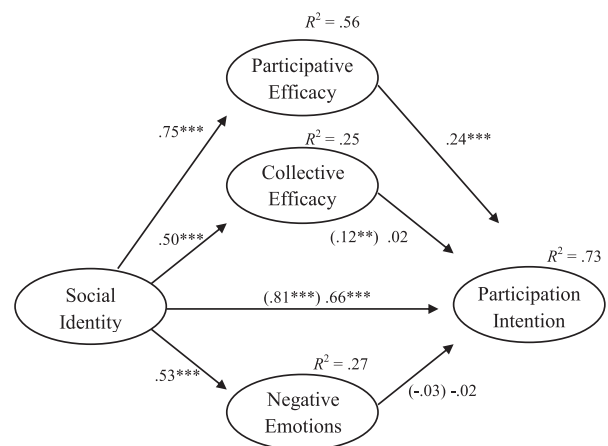
Note. PBC = perceived behavioral control; standardized coefficients, * $p < .05$; ** $p < .001$.

Fig. 1. Results of SEM testing the dual-pathway model of collective action.

motive corresponds to the subjective norm component. While the cost-benefit pathway explains group members' involvement motivated by extrinsic rewards, the social identity pathway explains involvement based on group members' inner obligation to act upon internalized norms and goals of the movement. In Stürmer and Simon's (2004) study, the identification with the movement contributed uniquely to the prediction of intended or actual social movement participation even when the effects of the cost-benefit components were controlled for.

4.2. The social identity model of collective action

Developed by Van Zomeren et al. (2008, see Fig. 2), the social identity model of collective action (SIMCA) integrates the collective efficacy, negative group-based emotions, and social identity pathways. Thus, according to the model, people will take action when they believe that their group's actions can be effective, experience strong affective reactions (e.g., to injustice), and identify with the social group trying to mobilize action. The SIMCA also underlines the pivotal role of social identity processes in the appraisal of group-based emotions and efficacy beliefs. It proposes that social identity is both a direct predictor of social action, and an indirect predictor, mediated via the group-based emotion and collective efficacy pathways.



Note. Standardized coefficients, ** $p < .01$; *** $p < .001$.

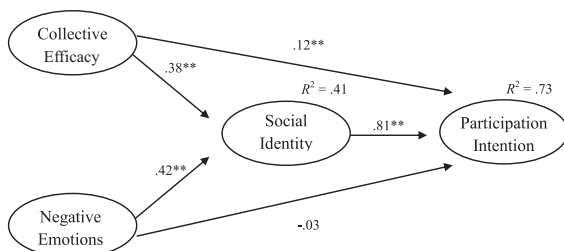
Fig. 2. Results of SEM testing the extended (and original) SIMCA.

4.2.1. Participative efficacy beliefs as additional collective action predictor

Van Zomeren, Saguy, and Schellhaas (2013) extended the SIMCA by the novel concept of participative efficacy beliefs, aiming to unravel Olson's (1965) paradox of collective action participation as a social dilemma: When rational actors believe that their group can achieve its goals through collective action (i.e., when they have strong collective efficacy beliefs), they should not participate in this collective action because they expect little benefit from their own participation. Paradoxically, however, research (e.g., Van Zomeren et al., 2008) shows that individuals are more likely to participate when their collective efficacy beliefs are stronger. Van Zomeren et al. (2013) propose participative efficacy beliefs (i.e., the belief that one's own actions will "make a difference" to collective efforts at achieving group goals) as an explanation of this paradox. Although participative as well as collective efficacy beliefs refer to the achievement of group goals through collective efforts, only participative efficacy beliefs explicitly include the belief in the incremental contribution of one's own action to the group's success. As such, Olson's (1965) rational actors may free ride when they have strong *collective efficacy* beliefs, but they will be more reluctant to do so when they have strong *participative efficacy* beliefs. Three correlational studies reported by Van Zomeren et al. (2013) support the construct and predictive validity of participative efficacy beliefs. In two of these studies, however, including participative efficacy into the SIMCA framework rendered collective efficacy insignificant.

4.3. The encapsulation model of social identity in collective action

Already Van Zomeren et al. (2004, 2008) recognize that there may be other plausible causal sequences of the SIMCA variables. Consequently, Thomas, McGarty, and Mavor (2009, 2012) suggested such an alternative causal order in their encapsulated model of social identity in collective action (EMSICA, see Fig. 3), retaining but reversing the central role of social identity processes. Apart from direct effects of collective efficacy and group-based emotions on collective action participation intention, the EMSICA assumes that social identification mediates both effects. To clarify the distinct contribution of EMSICA, consider a situation in which an individual's attention is caught by an instance of social injustice. That individual may experience strong affective reactions to the injustice (such as anger or outrage), and simultaneously believe that collective efforts amongst like-minded people can be successful in overcoming the injustice. This whole chain of reactions could precede and precipitate group formation, thereby forming social identity on the basis of shared emotional reactions and collective efficacy beliefs.



Note. Standardized coefficients, ** $p < .001$.

Fig. 3. Results of SEM testing the EMSICA.

4.4. Social identity as a moderator of psychological collective action mechanisms

The three models presented above conceptualize social identity as direct, mediating or mediated determinant of collective action participation. However, some studies discuss social identity as a *moderator* of the psychological mechanisms underlying collective action participation. Stürmer and Simon (2004, but see also Van Zomeren et al., 2008) argue that higher identifiers with a group are more intrinsically motivated to engage in collective action than lower identifiers, and consider group (rather than individual) goals and interests as more binding. In contrast, lower identifiers with a group are seen as more extrinsically motivated, focusing more on the expected personal costs and benefits than on committing to group goals. Whether social identity functions as a direct, mediating, mediated or moderated determinant of collective action intention or participation therefore remains an open question and is tested empirically in the present paper.

5. Study 1

5.1. Participants, design, and procedure

Six-hundred-fifty-two students (385 females, $M_{age} = 24.2$, $SD_{age} = 7.9$) enrolled in one Austrian and two German universities participated in a survey study conducted during lectures. While constituting a convenience sample, students to some degree reflect the young, highly educated population segment from which TT groups recruit many of their members. Participants were first asked to read a short, 1-page text about the TT movement. The text informed about the international character of the TT movement, its vision of a post-carbon world and described in some detail the local activities typically undertaken by TT groups in the students' region for reaching this vision. Participants were then asked to complete a short questionnaire regarding their judgment of this movement, especially their own intention to participate in such a group. All items were assessed in German and used 5-point Likert scales; we will only mention the labels of the scale endpoints.

5.2. Measures

5.2.1. Participation intention

Three items assessed participation intention: "How strong is your intention to actively and regularly participate in a local TT group?" (very low – very high); "How strong is your desire to actively and regularly participate in a local TT group?" (very weak – very strong); "How likely would you actively and regularly participate in a local TT group?" (less likely – very likely).

5.2.2. Attitude toward participation

After the question "How do you judge the personal consequences of an active and regular participation in a local TT group?" the two adjective pairs "unpleasant – pleasant" and "bad – good" were used to assess this construct.

5.2.3. Subjective norm toward participation

This construct was assessed using the two items "How likely is it that persons, who are important to you, would actively and regularly participate in a local TT group?" (not likely – very likely); "Would persons, who are important to you, support your active and regular participation in a local TT group?" (not likely – very likely).

5.2.4. Perceived behavioral control over participation

After the question "Considering the background of your current life situation, how do you judge the active and regular participation

in a local TT group?” the two adjective pairs “hard – easy” and “tedious – effortless” assessed this construct.

5.2.5. Negative emotions

“Reflecting on what government and economy are currently doing to stop climate change, how strong do you feel the following emotions?” Anger, outrage, rage (not at all – very strong).

5.2.6. Group identification

The question “How strongly do you agree with the following statements?” was followed by three items: “I would be glad to be a member of a local TT group”; “I feel strong ties to persons who are members of TT groups”; “Being a TT group member would be an important part of my self-image” (not at all – very strong).

5.2.7. Collective efficacy

“Through joint actions, TT groups could effectively contribute to local climate protection.”; “TT groups could make an effective contribution to local climate protection.” (completely disagree – completely agree).

5.2.8. Participative efficacy

“My active collaboration would be a significant contribution for a local TT group to reach its goals through joint actions.”; “With my active collaboration I would make a significant contribution that a TT group could work effectively for local climate protection.” (completely disagree – completely agree).

5.3. Results

5.3.1. Descriptive results

Means, standard deviations, and correlations of the eight assessed constructs can be found in Table 1. For seven of the eight item indices the Cronbach's α s were satisfying (see diagonal of matrix in Table 1), only the one for the subjective norm index was marginally lower than .70. A confirmatory factor analysis supported the validity of the eight constructs ($\chi^2_{df=124} = 205.04, p < .001$; χ^2/df ratio = 1.64; GFI = .99, TLI = .98; RMSEA = .033, all factor loadings > .71). Table 1 also shows that the means of group-based emotions, participative efficacy, attitude, and especially collective efficacy were all above the scale mid-point of 3. Thus, on average the participating students reported some anger when reflecting on what government and economy are currently doing for climate protection, were convinced that with their collaboration in such a group they could make a significant contribution to successful collective actions for local climate protection, expected positive personal consequences from participating in TT groups, and perceived the work of TT groups as an effective contribution to local climate protection. Nevertheless, participants' intention to actually participate in a local TT group was low. The bivariate correlations reported in Table 1 (correlations between manifest mean scores of

the respective scales are displayed in the lower triangle; correlations between estimated latent constructs from structural equation modeling are displayed in the upper triangle of the table) indicated that this low intention was most strongly associated with the students' low identification with TT groups.

5.3.2. Testing the dual-pathway model of collective action

Developed by Stürmer and Simon (2004), the dual-pathway model integrates the cost-benefit and social identity pathways to collective action. In the present study we operationalized the cost-benefit calculations via Ajzen's (1991) theory of planned behavior (TPB). As its predecessor, the theory of reasoned action, the TPB includes attitude and subjective norm as intentional predictors. The attitude concept summarizes a person's beliefs about the positive and negative consequences associated with a behavior. The concept of subjective norm summarizes the perceived social support or disapproval associated with the performance of a behavior. The third TPB concept, perceived behavioral control, summarizes the individuals' beliefs about internal and external factors making the behavioral performance difficult or “costly”. Since the behavioral control concept is well-established as an intentional predictor in the environmental psychology literature, from our point of view the TPB provides a more appropriate operationalization of the cost-benefit pathway than the theory of reasoned action. The social identity construct is added as an additional intention predictor. As shown in Fig. 1, our data supports this model within the domain of local collective climate action. Perceived behavioral control was significantly associated with intention ($\beta = .27$), the same held true for subjective norm ($\beta = .14$). The intention–attitude association, however, was insignificant ($\beta = .01$). Controlling for the effect of the three TPB constructs, social identity emerged as the most powerful predictor ($\beta = .61$). All four predictors together explained 80% of variance in intention. The fit of this model was excellent ($\chi^2_{df=42} = 56.33, p = .07$; χ^2/df ratio = 1.34; GFI = 1.00, TLI = 1.00; RMSEA = .023).

5.3.3. Testing the SIMCA

Developed by Van Zomeren et al. (2008) the SIMCA integrates the social identity, group-based emotions, and collective efficacy-pathways to collective action. Beyond a direct effect of social identity on participation intention, the SIMCA postulates two additional indirect effects of social identity via group-based emotions and collective efficacy. Group-based emotions and collective efficacy themselves should have direct causal effects on intention. Fig. 2 (coefficients within parentheses) presents the results of the SIMCA test with our TT participation intention data. As postulated, social identity was not only a very powerful direct predictor of intention ($\beta = .81$), but also significantly predicted collective efficacy ($\beta = .50$) and group-based emotions ($\beta = .53$). Social identification thus explained 27% variance in group-based emotions, and 25% variance in the collective efficacy construct. Also as predicted

Table 1
Descriptive statistics of main measures in Study 1.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1 Participation Intention	2.73	1.01	0.90	0.55	0.73	0.71	0.43	0.52	0.76	0.85
2 Attitude	3.66	0.81	0.47	0.83	0.59	0.41	0.24	0.53	0.63	0.53
3 Subjective Norm	3.05	0.96	0.57	0.44	0.69	0.72	0.39	0.53	0.71	0.66
4 Perceived Behavioral Control	2.37	1.01	0.61	0.35	0.55	0.87	0.27	0.30	0.54	0.55
5 Group-based Emotions	3.20	0.93	0.37	0.19	0.29	0.24	0.81	0.27	0.37	0.51
6 Collective Efficacy	3.90	0.86	0.45	0.44	0.40	0.25	0.23	0.82	0.71	0.48
7 Participative Efficacy	3.31	0.92	0.62	0.49	0.50	0.42	0.29	0.54	0.74	0.74
8 Social Identity	2.78	0.98	0.74	0.46	0.50	0.48	0.45	0.42	0.60	0.84

Note. Lower triangular matrix: correlations of the observed variables, upper triangular matrix: correlations of the latent variables; diagonal: Cronbach's alpha.

by the SIMCA, collective efficacy was significantly linked with participation intention ($\beta = .12$). However, unexpectedly, group-based emotions did not significantly predict participation intention ($\beta = -.03$). Social identity and collective efficacy together explained 73% of variance in intention. The fit of this model was very good ($\chi^2_{df=37} = 66.27, p < .001$; χ^2/df ratio = 1.79, GFI = .99, TLI = .99; RMSEA = .035).

5.3.4. Testing an extended SIMCA with participative efficacy as additional predictor

Van Zomeren et al. (2013) introduce participative efficacy as an additional predictor into their SIMCA model. This variable captures the belief that one's own contribution makes a difference to a group's efforts. As such it represents a conceptual bridge between individual and collective efficacy beliefs. In Fig. 2, the coefficients without parentheses present the results of the extended SIMCA with participative efficacy as additional intentional predictor. In the extended model, social identity retained a strong direct link with participation intention ($\beta = .66$). The association between group-based emotions and intention remained insignificant. Furthermore, our results support the hypothesis that the newly introduced concept of participative efficacy is an independent and significant predictor of participation intention ($\beta = .24$). However, as in Van Zomeren et al. (2013), including participative efficacy as predictor reduced the collective efficacy–intention relation to insignificance. Probably for this reason the increase in explained intentional variance was minimal (from 73% to 74%). The fit of the extended SIMCA model was, again, very good ($\chi^2_{df=55} = 88.55, p < .001$; χ^2/df ratio = 1.61, GFI = .99, TLI = .99; RMSEA = .032).

5.3.5. Testing the EMSICA

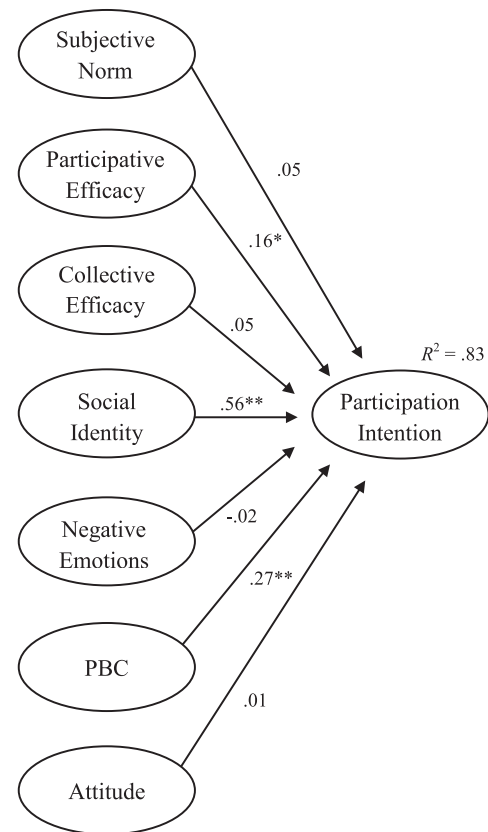
With their EMSICA, Thomas et al. (2009) suggest an alternative model of the causal relationships stated in the SIMCA. Social identity remains the central direct determinant of collective action, however, social identity is considered to mediate the effects of group-based emotions and collective efficacy on collective action intention (instead of these constructs mediating the effect of social identity). Fig. 3 presents the results of an SEM testing the EMSICA with our TT data set. In this model, collective efficacy ($\beta = .38$) and group-based emotions ($\beta = .42$) both qualified as significant predictors of social identity. Furthermore, social identity fully mediated the effect of group-based emotions and partly mediated the effect of collective efficacy on participation intention. After controlling for this mediation, collective efficacy exerted an additional significant direct effect ($\beta = .12$) on intention. Together, social identity and collective efficacy explained 73% variance in intention. The fit of this model fit was good ($\chi^2_{df=36} = 66.12, p < .001$; χ^2/df ratio = 1.84, GFI = .99, TLI = .99; RMSEA = .036).

5.3.6. Testing an integrated predictor model

Fig. 4 presents the results of a model using all seven constructs introduced in the models tested above as predictors of participation intention. As can be seen from Fig. 4, when controlling for the effect of all seven predictors, only social identity ($\beta = .56$), perceived behavioral control ($\beta = .27$), and participative efficacy ($\beta = .16$) were significantly associated with participation intention. Together, these three predictors explained 83% variance in intention. The fit of this model was good ($\chi^2_{df=116} = 189.83, p < .001$; χ^2/df ratio = 1.64, GFI = .99, TLI = .99; RMSEA = .030).

5.3.7. Testing the moderating role of social identity

In this section, we test the hypothesis proposed by Stürmer and Simon (2004) as well as Van Zomeren et al. (2008) that lower identifiers focus more on the expected personal benefits and costs of collective actions, whereas higher identifiers are more strongly



Note. Standardized coefficients, * $p < .05$; ** $p < .001$.

Fig. 4. Results of SEM testing an integrated predictor model of participation intention.

influenced by perceived group norms prescribing participation in collective action. We used the 33% and 66% percentile to divide the total sample into the subgroups “low” (31.2%, $n = 203$), and “high identifiers” (30.9%, $n = 202$). Within each subgroup, we specified an SEM including participation intention as the dependent variable and the six constructs attitude, PBC, subjective norm, negative emotions, collective efficacy, and participative efficacy as predictors. For both subgroups, Fig. 5 presents the results of an SEM including only the statistically significant predictors. For the subgroup of low identifiers (Fig. 5a) the SEM results supported the hypothesis that these participants focus mainly on the expected personal benefits and costs of participating in a TT group. Only the two TPB constructs attitude ($\beta = .34$) and PBC ($\beta = .50$) were statistically significant determinants of participation intention. The model fit was excellent ($\chi^2_{df=11} = 18.16, p = .08$; χ^2/df ratio = 1.65, GFI = .99, TLI = .97; RMSEA = .068). For the subgroup of high identifiers (Fig. 5b) the SEM results supported the hypothesis that these participants focus mainly on the group norm ($\beta = .45$). Participative efficacy exerted a significant effect in this subgroup, too ($\beta = .35$). Again, the model fit was excellent ($\chi^2_{df=11} = 13.28, p = .28$; χ^2/df ratio = 1.21, GFI = .99, TLI = .99; RMSEA = .039).

6. Intermediate discussion

The first study confirms our basic notion that research on collective climate action can learn and benefit from theoretical and empirical work in the realm of collective protest. Antecedents of collective action participation in the protest context were generally

confirmed for the environmental context. In our study, these constructs together could explain 83% of variance in intention. At least two points, however, seem worth exploring more.

First, while traditional approaches to collective action have focused on “cold” variables and cost-benefit-calculations (Olson, 1965; Stürmer & Simon, 2004), current models shifted their focus toward “hotter” variables, and emphasize the central role of social identification (Thomas et al., 2009; Van Zomeren et al., 2008). We argue that there is merit in both approaches and, based on our data, it seems worthwhile to also include cost-benefit-calculations into models of collective climate protection action. Particularly, perceived behavioral control and subjective norms turned out to be relatively reliable predictors of collective climate action intention. This result also questions the applicability of the “narrow” collective action definition within social injustice research for understanding collective climate protection action. This “narrow” definition assumes that collective action is always motivated by a strong identification with a disadvantaged group. Thus actions by a group would consequently not qualify as collective action if the individual actors are motivated by personal goals or self-interests. Our results, however, indicate that collective climate protection action is better understood as a mixture of social identification and personal cost-benefit calculations. Thus, within the pro-environmental domain we propose a more inclusive definition, understanding collective action as the joint activities by a wide

group of actors on the basis of mutual interest in improving community livability and local ecological and economic resilience.

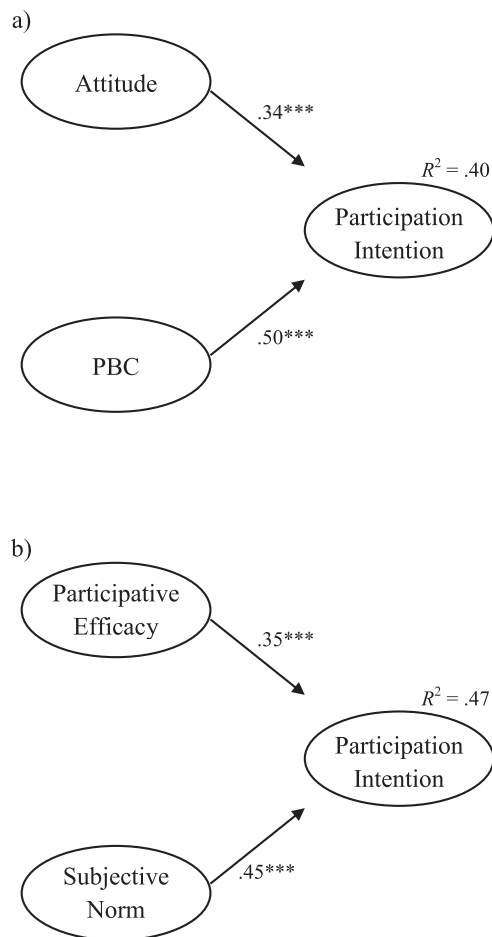
Second, we found some indication that different constructs seem to be effective predictors of participation intention depending on the individual level of identification with the group or movement, i.e., that social identification moderated the predictive power of the constructs. On the one hand, its moderating role confirms the importance that virtually all current models ascribe to the construct of social identity. Methodologically, on the other hand, this differential pattern of predictors for high- and low-identifiers poses something of a challenge for research in the area: If the predictors of collective action intention vary for high- and low-identifiers, then more systematic research using samples of participants who are already more engaged than the average citizen (i.e., high identifiers) could certainly help understand the phenomenon of collective climate action. Studies 2 and 3 were therefore conducted to explore the predictors of collective climate action intention identified in Study 1 using samples of high identifiers. To further establish the predictors of participation intention, a secondary aim of the next two studies was to replicate the pattern of results obtained in Study 1.

7. Studies 2 and 3

The second and third study address the role of social identity in contexts of more-than-average identifications with collective climate protection action. For this purpose, Study 2 analyzes data obtained from a sample of citizens ($N = 71$) of a small village (ca. 1500 inhabitants) who followed their mayor's invitation to participate in a series of meetings aimed to develop a local action plan for reaching energy autonomy. Energy autonomy implies reducing the village's dependence on fossil energy by extensive energy saving actions and intensifying the local energy production via wind and solar power. Study 3 analyzes data obtained from a sample of green activists ($N = 88$) visiting a talk given by Rob Hopkins, the founder of the TT movement. Apart from this higher threshold for collective action than Study 1, at the same time, Studies 2 and 3 put the role of cost-benefit-calculations to an even stronger test by investigating if they would still be significant predictors for highly identified individuals. As the studies surveyed high identifiers, we expected participative efficacy and subjective norms to be significant predictors of participation intention as found in Study 1.

7.1. Design and procedure

In both studies, participants were asked to fill out a brief questionnaire when they arrived for the event. In compliance with the organizers' privacy requirements, no personal data were collected. However, visual inspection indicated a significantly higher age of participants in Studies 2 and 3 than in Study 1. Furthermore, whereas the sample in Study 2 consisted mainly of mid-aged males, the sample in Study 3 was dominated by mid-aged females. Items of the 1-page questionnaire were rephrased where appropriate to reflect the slightly different contexts of the initiative and the TT movement but were otherwise identical to those used in Study 1.¹ As target variable, participants were asked to state their own intention to participate in the initiative (Study 2) or a TT group



Note. Standardized coefficients, *** $p < .001$.

Fig. 5. Moderation of predictive power of model constructs via social identification: significant predictors of participation intention for low (a) and high (b) identifiers.

¹ As participants in Study 3 were expected to be familiar with the TT movement, and in order to keep the questionnaire brief, the informative text on TT used in Study 1 was omitted. As the construct was no reliable predictor in the first two studies and, again, to keep the questionnaire in Study 3 as brief as possible, attitude was also not measured in this particular study. Apart from these changes, the questionnaire was virtually identical to the one used in Studies 1 and 2.

(Study 3); all items were assessed in German using 5-point Likert scales. Also, in Study 2, individuals' participation in the following three meetings of the local energy autonomy initiative was recorded to form an index of actual participation.

8. Results and discussion

As the samples were relatively small, we refrained from using structural equation modeling to analyze the two data sets and used linear regression instead. Identification with the local energy autonomy initiative and the TT movement, respectively, was generally high in the samples ($M = 3.48$, $SD = 0.92$, and $M = 4.09$, $SD = 0.64$, respectively). As expected one-group t -tests indicated that identification was higher in both samples than in the sample used in Study 1, $t(70) = 6.34$, and $t(87) = 5.55$, both $ps < .01$.

To test our hypotheses, in a first step, we computed regression models parallel to the integrated predictor model in Study 1 (Fig. 4). Tables 2 and 3 present the results of a regression model without (Model 1) and with (Model 2) social identity as intention predictor. As for the high identifiers in Study 1, participative efficacy significantly predicted participation intention in both studies when social identity was included in the model (i.e., Model 2; Study 2 $\beta = .43$; Study 3 $\beta = .27$). In Study 2, subjective norm ($\beta = .28$) was also a significant intention predictor. Unexpectedly, in both studies, perceived behavioral control also emerged as significant predictor (Study 2 $\beta = .20$; Study 3 $\beta = .17$). Neither group-based emotions nor collective efficacy were significant predictors of participation intention in any of the two studies. The predictive pattern held even when including social identity as additional predictor in a second step. This variable, in turn, was another significant predictor of participation intention in the final model (Study 2 $\beta = .18$; Study 3 $\beta = .32$; see Model 2 in Tables 2 and 3, respectively).

In Study 2 (Model 3), we also investigated which of the variables predicted actual attendance of meetings (ranging from 0 = 'no additional meeting attended after the kick-off meeting' to 3 = 'all three additional meetings attended'). Participation intention was the only significant predictor in a model controlling for all other variables, $\beta = .58$, $p < .05$. Intention explained 47% of variance in behavior.

The results from these two studies thus essentially confirmed the basic premise of the current paper, namely that the same constructs predicting participation intention in other collective action contexts also predict individuals' intention to participate in collective climate action. Study 2 was also a welcome opportunity to demonstrate that this intention, in turn, predicted actual engagement. Using two independent samples of highly identified individuals, we were able to replicate the result that their participation intention was mainly driven by participative efficacy. The

Table 3
Predictors of participation intention in Study 3.

Predictor	Model 1		Model 2	
	B (SE)	β	B (SE)	β
Constant	.21 (.79)		-.28 (.75)	
Participative Efficacy	.31 (.12)*	.30	.27 (.12)*	.27
Collective Efficacy	.18 (.15)	.15	.07(.15)	.06
Subjective Norm	.14 (.13)	.12	.13 (.12)	.11
Group-based Emotions	.17 (.10)	.19	.07 (.10)	.07
Perceived Behavioral Control	.19 (.10)*	.21	.15 (.10) [†]	.17
Social Identity			.41 (.17)*	.32

Note. B = unstandardized regression coefficient, SE = standard error, β = standardized regression coefficient; statistics for Model 1: $F(6,58) = 6.45$, $p < .001$; $R^2 = .34$; statistics for Model 2: $F(7, 55) = 49.70$, $p < .001$; R^2 -change = .06, $p < .05$.

* $p < .05$. [†] $p < .10$.

role of subjective norm, however, was not as clear cut: In Study 2, subjective norm was the second strongest predictor of participation intention; in Study 3, it was not linked with participation intention at all. One might speculate that in Study 2, the strong norm effect may have reflected the small village context where familiarity among the participants may imply stronger social-normative control. Another explanation may be that the TT movement in Study 3 offered a broad spectrum of sustainability worldviews to identify with, whereas local energy autonomy in Study 2 was a narrower topic where congruence of individual opinions is less likely. In both studies, however, the results confirmed the important motivational role of social identity, even at this high level of identification. Unexpectedly and slightly diverging from our results in Study 1, another classical cost-benefit construct, perceived behavioral control, emerged as significant predictor of participation intention. Maybe a certain period of engagement in collective action is needed for participants to realize that such engagement also implies time management. The high identifiers from Studies 2 and 3 presumably had previous experiences enabling them to realistically assess the time and effort such engagement will take. We return to this issue in the general discussion.

9. General discussion

The current paper explores how theoretical and empirical insights into the motives underlying collective action participation gained in the domain of social injustice and protest can be transferred to the field of collective climate protection action. We presented motivational pathways discussed in the literature as leading to individual engagement in collective action, and compared theoretical models integrating these pathways using data from a

Table 2
Predictors of participation intention and actual participation in Study 2.

Predictor	Model 1 (Intention)		Model 2 (Intention)		Model 3 (Behavior)	
	B (SE)	β	B (SE)	β	B (SE)	β
Constant	-.52 (.34)		-.59 (.33)		-1.84 (.81)	
Attitude	.01 (.07)	.01	.01 (.06)	-.01	.24 (.15)	.15
Participative Efficacy	.55 (.09)**	.50	.47 (.09)**	.43	.09 (.26)	.06
Collective Efficacy	.07 (.07)	.06	.05 (.07)	.05	.11 (.17)	.08
Subjective Norm	.32 (.08)**	.33	.27 (.08)**	.28	.15 (.21)	.12
Group-based Emotions	-.03 (.05)	-.03	-.04 (.05)	-.04	-.02 (.12)	-.02
Perceived Behavioral Control	.23 (.09)*	.21	.22 (.08)*	.20	.28 (.21)	.19
Social Identity			.18 (.07)*	.18	.23 (.18)	.17
Intention					.75 (.33)*	.58

Note. B = unstandardized regression coefficient, SE = standard error, β = standardized regression coefficient; statistics for Model 1: $F(6,56) = 51.40$, $p < .001$; $R^2 = .83$; statistics for Model 2: $F(7, 55) = 49.70$, $p < .001$; R^2 -change = .017, $p < .05$; statistics for Model 3: $F(8, 54) = 7.85$, $p < .001$.

** $p < .001$ * $p < .05$.

student sample (Study 1) as well as two more engaged samples (Studies 2 and 3), predicting participation intention in a local energy autonomy initiative and the TT movement.

In general, the results of our correlational studies indicate that we can learn from the field of collective protest and apply models developed in this context to the sustainability domain. Concepts from all four motivational pathways yielded statistically significant and substantive bivariate correlations with the intention to participate in a TT initiative. In Study 1, this correlation was particularly strong for social identity ($r = .74$) and particularly low for group-based negative emotions ($r = 0.37$).

9.1. Re-introducing cost-benefit calculations as predictors of collective action

In order to disentangle the unique contribution of each construct, we compared models integrating different pathways. As current collective action research tends to neglect the role of cost-benefit calculations, we operationalized this motive using the TPB (Ajzen, 1991). All three TPB constructs qualified as significant predictors of participation intention and explained 68% of variance in intention in Study 1. When controlling for the effect of additional variables specified by the dual pathway model, the SIMCA and EMSICA, the effect of PBC (assessing the individual efficacy associated with collective action participation) remained statistically significant and substantive. In the more engaged samples in Studies 2 and 3, again, PBC emerged as significant predictor of collective participation intention. Collective action in the environment and climate protection domain seems to be also influenced by the perceived effort an individual has to put in this collective engagement. Based on the present studies, we would thus recommend a research program on collective action in environmental psychology recognizing that collective action is motivated simultaneously by individual cost-benefit calculations as well as the identification with group goals.

Such recognition would also acknowledge the strong empirical evidence for the role of social identity as the central collective action motive throughout the dual pathway model, the SIMCA, and EMSICA. After controlling for the effect of all other predictors, social identity consistently showed the strongest direct effect on participation intention throughout our analyses.

The analyses also point to the predominance of participative efficacy over collective efficacy in all three studies. When controlling simultaneously for the effect of collective efficacy and participative efficacy, only the latter qualified as a significant predictor of participation intention. This result supports Van Zomeren et al.'s (2013) notion that the belief that one's own actions will "make a difference" to collectively achieving group goals exceeds the impact of the general belief that a group can reach its goals through common actions.

Finally, in the introduction, we have touched upon the paradox of individuals' engagement in groups that they perceive to be highly efficacious: Theoretically, it could be expected that individuals will not participate in such groups as this would not yield additional benefits for the individual. Based on the work by Van Zomeren et al. (2013), we have argued that even if perceptions of collective efficacy are high, individuals will engage in collective action if *participative efficacy* beliefs are stronger. An alternative reading of some of the analyses we have presented could be that participants simply like to identify with a group that they believe could achieve its goals (i.e., a group that is highly efficacious), because this would imply a powerful social identity (Tajfel & Turner, 1986). While we believe this alternative explanation might apply under certain circumstances (e.g., for low identifiers who like becoming a member of a powerful group), we also found

participative efficacy to be consistently linked with collective climate action intention, especially for high identifiers. This pattern of results is well in line with the rationale developed by Van Zomeren et al. (2013).

9.2. Group-based emotions and collective climate action

Interestingly, our results consistently diverge from established models of collective protest in one crucial aspect: Our data did not provide empirical evidence for the direct influence of group-based anger or outrage on the collective action motive. The bivariate correlations between group-based emotions and collective action participation intention were already relatively low ($r = .37$ in Study 1, $r = .20$ in Study 2, and $r = .25$ in Study 3). When controlling for other constructs, however, group-based emotions were no longer linked with participation intention. If other studies replicate this result, one possible explanation may be that the environment and climate protection movement is indeed better characterized as an opinion-based, conversionary collective movement than as a competitive collective movement. Wright (2009) argues that because conversionary collective movements are interested in converting "them" into one of "us", their actions should be motivated more strongly by integrative motives than by negative hostile emotions such as anger. However, the lack of impact of group-based emotions could also be because of differently framed items: Items on negative emotions refer generally to the "government and economy", while all other items specifically mention local environment and climate protection movements.

Another possible explanation might be that engagement in climate protection initiatives is motivated by different emotions than engagement in collective protest. While the latter has consistently been linked with anger and outrage (Iyer, Schmader, & Lickel, 2007; Van Zomeren et al., 2008, 2011), other-focused moral emotions directed at majority groups or those in power, self-directed moral emotions such as guilt or shame may be more relevant when it comes to motivating collective climate action (Böhm, 2003; Böhm & Pfister, 2000; Ferguson & Branscombe, 2010). Indeed, in a similar context, we recently found that a guilty conscience for the damages done to the environment motivated pro-environmental intentions, personal behavior (Rees, Klug, & Bamberg, 2015) or collective climate action intention (Rees & Bamberg, 2014). Future research should further investigate the specific emotions motivating collective climate action and may find it fruitful to differentiate between emotions of guilt, shame, anger, and outrage, but also anger directed at different targets (e.g., the government and economy as in the current study versus more clear-cut out-groups such as other countries contributing to environmental pollution; see Täuber & Van Zomeren, 2013). Finally, another emotion that has recently been linked with pro-environmental behavior is hope for constructive change (Ojala, 2012).

To summarize, our results indicated that participative efficacy, individual efficacy, and especially social identity are important drivers of collective action participation in the environment and climate protection field. Taken together, these constructs accounted for 80% (Study 1), 86% (Study 2), and 40% (Study 3) of the variance in the intention to participate in local TT groups or an energy autonomy initiative. Initiatives aiming to recruit new members might thus want to focus on these aspects in their public communication.

9.3. A temporal perspective on collective action engagement

As hypothesized by Stürmer and Simon (2004), the participation intention of students in Study 1 who described themselves as low identifiers, was influenced by cost-benefit calculations only, whereas among high identifiers the same intention depended only

on perceived group norms and participative efficacy. Data of highly identified individuals attending a local climate protection initiative or TT event in Studies 2 and 3 essentially replicated the results from Study 1, with perceived group norms and participative efficacy (along with perceived behavioral control) emerging as significant predictors of collective climate action intention. A time perspective may help interpret these results: When approached for the first time to join a collective movement, a person's decision to participate may be mainly driven by his or her assessment of personal costs and benefits (Olson, 1965). However, more frequent contacts and group activities over time should increase the person's identification with this group (Thomas et al., 2009; Van Zomeren et al., 2004). As a consequence, his or her decision to stay in the group and participate in further collective actions may be determined by internalized group norms and participative efficacy (Stürmer & Simon, 2004; Van Zomeren et al., 2013). The same may be true for a realistic assessment of one's commitment to a social movement such as TT: For high identifiers attending local events (Studies 2 and 3), participation intention was also influenced by perceived behavioral control. This finding might indicate that a certain amount of experience and time is needed so that participants can accurately judge which factors influence their participation in the movement.

Time may also be important for understanding the causal role of social identity, wherein the SIMCA and EMSICA models seemingly contradict each other: SIMCA assumes that social identity facilitates subjective experiences of group-based injustice and efficacy, thereby acting as causal precursor of negative emotions and collective efficacy. Reversing the causal direction, EMSICA contrastingly assumes that affective reactions to a perceived injustice (such as anger or outrage), and simultaneously believing that collective efforts amongst like-minded people can be successful in overcoming the injustice precede group formation and social identity. SIMCA and EMSICA may both capture meaningful aspects of the temporal-dynamic nature of social identity in collective action (see also Drury & Reicher, 2000). Whereas EMSICA may describe experiences gradually increasing a person's identification with a collective movement, SIMCA may describe how the activation of a strong social identity motivates a person to join a collective action representing this social identity.

9.4. Limitations and future research

Of course, all of the above arguments are based on correlational data, with all the concerns and limitations linked with this kind of data. Especially for better understanding the causal relations between the discussed concepts and their dynamic nature, longitudinal studies with sufficient measurement points are needed. Future studies may use the paradigm developed by Van Zomeren and colleagues for testing causal associations. In this paradigm, participants are confronted with real-life examples of collective threats, aiming to manipulate their appraisal of the situation. Then their appraisal and coping responses are measured through self-report.

A second limitation concerns the example initiative we used for exploring the relevance of collective action motives in the field of climate protection: Probably most respondents in Study 1 had not heard about the TT movement prior to our study. These participants formed their judgment of how strongly they identified with this movement spontaneously while reading the questionnaire's introductory text. Participants in Studies 2 and 3, however, were visiting local events, and probably more familiar with the respective collective action movement. Consequently, they had probably already formed a more stable social identity before participating in our study. As the pattern of results was similar across all three

studies, however, we are confident that the current results can be generalized to a wider public as well.

Finally, Studies 1 and 3 assessed only participation intention and not actual participation. Future studies would benefit from studying the association between participation intention and actual participation. We would predict this association to be significant but only of medium size, reflecting the well-known "intention-behavior gap" (Webb & Sheeran, 2006). As one first step, in Study 2 we could show that participation intention in fact predicted actual participation. Still, future studies are needed using more stringent measures of actual engagement in collective climate action.

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