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Experimental evidence for a dual pathway model analysis of coping with the climate crisis

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ABSTRACT

Two experiments examined the psychological power of fear and group efficacy beliefs to increase environmental action intentions against the climate crisis. Extending a dual pathway model of coping with collective disadvantage, results showed evidence for emotion-focused approach coping: Environmental action intentions were increased by individuals' manipulated fear of the negative future consequences of the climate crisis (Experiments 1–2). Additionally, results showed evidence for problem-focused approach coping: Individuals' measured (Experiment 1) and manipulated group efficacy beliefs (Experiment 2) increased environmental action intentions. The results thus suggest that the dual pathway model can be successfully applied to a psychological analysis of emotion- and problem-focused approach coping with the climate crisis. We discuss the theoretical and practical implications of these results.

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1. Introduction

An inconvenient truth, the book and documentary by Nobel-prize laureate and former US Vice-President Al Gore (Gore, 2006), is a real-life example of the presumed power of psychology to increase pro-environmental behavior by telling individuals what they could do, and by telling them what to fear if they fail to do this. Although many applauded Gore's efforts to raise environmental awareness and action, there was a danger that the fear invoked by his message could be counter-productive. Raising fear about the consequences of smoking and safe sex, for example, is thought to undermine health behavior if individuals do not have a sufficient sense of efficacy to transform their fear into action (e.g., Leventhal, 1970; Rogers, 1975; Witte & Allen, 2000). Without such a sense of self-efficacy¹, fear is thought to lead individuals to protect themselves against their fear (rather than to take action to reduce the cause for fear). A key aim of this paper is to challenge this pessimistic conclusion.

Although we believe concern for the counter-productive effects of fear appeals is warranted, we think that self-protective responses are most likely in the context of individual problems such as individual health behavior. When individuals perceive a problem as an individual problem, their individual action should be best predicted by their self-efficacy beliefs (Bandura, 1995, 1997). Unlike smoking and safer sex, however, one can perceive the climate crisis as a collective problem that requires *collective action* (Hardin, 1968; Moser & Dilling, 2004; Olson, 1968). Collective action is aimed at promoting collective interests, even if it is pursued by individuals (Van Zomeren & Iyer, 2009; Wright, Taylor, & Moghaddam, 1990). When individuals perceive a problem as collective, their collective action should be best predicted by their *group efficacy* beliefs – the belief that group goals can be achieved through joint effort (Bandura, 1995, 1997; Klandermans, 1997; Mummendey, Kessler, Klink, & Mielke, 1999; Van Zomeren, Spears, Fischer, & Leach's, 2004). As the problem and the solution are perceived at the level of the group (rather than at the level of the individual), group efficacy beliefs should be most relevant to environmental action.

Viewing environmental problems such as the climate crisis as collective enables the application of models of collective action, such as the *dual pathway model of coping with collective disadvantage* (Van Zomeren et al., 2004; Van Zomeren, Spears, & Leach's, 2008; Van Zomeren, Spears, & Leach, 2010; for a review see Van Zomeren, Leach, & Spears, 2010). This model predicts that the

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¹ When we use the term *self-efficacy*, we refer to beliefs about individual agency. The term *group efficacy*, however, refers to beliefs about the agency of the group.

emotional experience of the collective problem, and the perceived group's *efficacy* to solve the collective problem, constitute distinct causal pathways to collective action. These two pathways represent different psychological coping mechanisms that can operate in tandem (Lazarus, 1991, 2001; see also Folkman & Moskowitz, 2004; Van Zomeren, Leach, et al., 2010). In the context of the climate crisis, we expect that fear of its negative future consequences is a form of *emotion-focused* approach coping that increases individuals' intentions to engage in environmental action. Moreover, as a form of *problem-focused* approach coping we expect that individuals' group efficacy beliefs should also increase individuals' environmental action intentions. Two laboratory experiments tested these predictions from the dual pathway model.

2. Coping with collective disadvantage

In the last decades, the social psychology of collective action has focused on the proximal socio-psychological determinants of collective action (Klandermans, 1997; for a meta-analysis see Van Zomeren, Postmes, & Spears, 2008). The starting assumption in this literature is that people respond to *subjective* problems, which sometimes do not necessarily flow from the "objective" conditions (e.g., Major, 1994; Postmes, Branscombe, Spears, & Young, 1999). Collective injustices, for example, can be legitimized by individuals, and environmental threats can be questioned or rejected. This is why psychology matters a great deal in predicting collective action (Van Zomeren, Postmes, et al., 2008). This is not to say that non-psychological explanations (e.g., Davies, 1962; Davis, 1959; Gamson, 1975; Gurr, 1970; McAdam, 1982; McCarthy & Zald, 1977; Olson, 1968; Tilly, 1978) do not matter – in fact, a general challenge for this field is to integrate insights from different disciplines (Klandermans, 1997; Van Zomeren, Postmes, et al., 2008).

From a psychological perspective, relative deprivation theory (Runciman, 1966; Stouffer, Suchman, DeVinney, Star, & Williams, 1949) and social identity theory (Tajfel & Turner, 1979) explain offer rich explanations of collective action that focus on the degree to which group members subjectively perceive their disadvantage as collective (Kawakami & Dion, 1992) and as unfair or otherwise harmful (Crosby, 1976; Walker & Smith, 2002). This line of thought suggests that collective action becomes more likely when individuals perceive the problem to be a *collective* and harmful problem. In contrast, some resource mobilization approaches have focused on more instrumentally-oriented explanations of collective action that emphasize individuals' group efficacy beliefs to solve collective problems (Klandermans, 1984; see also Mummendey et al., 1999). This work suggests that collective action becomes more likely when individuals perceive the group to be more resourceful and thus more able to achieve its goal through joint effort (Bandura, 1995, 1997, 2000; Mummendey et al., 1999).

The dual pathway model of coping with collective disadvantage (Van Zomeren et al., 2004; Van Zomeren, Spears, et al., 2008, 2010; for a review see Van Zomeren, Leach, et al., 2010) integrates the two main streams of thought in collective action research. The model predicts that individuals' appraisal of a collective problem (e.g., discrimination on the basis of gender or ethnicity, or a tax increase for a particular group) determines their emotional experience (for reviews see Lazarus, 1991; Scherer, Schorr, & Johnstone). For example, a member of a disadvantaged group may appraise this as unjust and thus feel anger, which fuels a desire for collective action (Walker & Smith, 2002). On the basis of Lazarus (1991) theorizing, Van Zomeren et al. (2004) conceptualized this path to protest as an *emotion-focused* type of coping because it focuses on the *regulation of emotions* tied to the situation (Lazarus, 1991). More specifically, because our model focuses on collective action, we conceptualized this as *emotion-focused approach* coping (whereas avoidance

coping is captured by denial or minimization of the problem; Austenfeld & Stanton, 2004; Folkman & Moskowitz, 2004; Stanton, Danoff-Burg, Cameron, & Ellis, 1994; for a review see Van Zomeren, Leach, et al., 2010).

However, there are more ways to cope with the same collective problem than to focus on emotion regulation. Individuals take into account, for instance, whether their group has the efficacy to achieve the group goal of solving the collective problem. Put differently, individuals consider whether joint action will be effective in achieving the collective goal (Bandura, 1995; Mummendey et al., 1999; Van Zomeren et al., 2004), which can occur independent of individuals' emotional experience of the collective problem. Van Zomeren et al. (2004) conceptualized this independent path to protest as a *problem-focused* type of approach coping. Problem-focused approach coping focuses on a type of regulation that incorporates information on the possibility to mobilize actions for the *purpose of changing reality* (Lazarus, 1991). Hence, the dual pathway model offers two distinct pathways to collective action.

The model has received support across experimental and field studies in the context of collective disadvantage (e.g., Van Zomeren et al., 2004; Van Zomeren, Spears, et al., 2008, 2010; Van Zomeren, Leach, et al., 2010), and has also been applied to different domains of collective action (e.g., volunteerism; Thomas, 2005). One unique aspect of the model is that most *causal* arrows in the model have now been experimentally tested and confirmed. For example, Van Zomeren, Spears, et al. (2010) hypothesized and showed that group efficacy beliefs increased individuals' intentions to undertake collective action. As such it moves beyond general (and mostly correlational) models of collective action (e.g., Klandermans, 1997). A second unique aspect of the model is that it is a *situational* model that predicts that changing individuals' appraisal of the situation changes how individuals cope with the situation. For example, Van Zomeren et al. (2004) hypothesized and found that manipulations of emotion- and problem-focused types of social support differentially affected problem- and emotion-focused approach coping with collective disadvantage. The dual pathway model can therefore be used as a basis for psychological interventions, such as how individuals can cope with the climate crisis in a positive and constructive way.

3. Coping with the climate crisis

Whereas environmental psychologists have documented different classes of variables that facilitate environmental behavior (e.g., affect and efficacy; Steg, 2003; Steg & Vlek, 2008), the dual pathway model provides a novel theoretical account of at least some of these specific variables and their inter-relationships. The model predicts that environmental action can be motivated by emotion- and problem-focused approach coping with a (perceived) collective environmental problem such as the climate crisis. The question is, however, how these general mechanisms manifest themselves in the specific context of the climate crisis. According to Lazarus (1991), the experience of anger requires a responsible out-group that can be blamed for the appraised harm done (see also Scherer, Schorr, & Johnstone, 2001). Unlike more prototypical collective action contexts (e.g., being discriminated on the basis of gender or ethnicity), such a clear culprit tends to be absent in the climate crisis. As a consequence, anger represents an unlikely type of emotion-focused approach coping here. Rather, the threat of the climate crisis relates to its potential negative future consequences. Thus, the emotion-focused approach coping that can occur will more likely be based in fear of future negative consequences (Lazarus, 1991; Scherer et al., 2001). Thus, based in the dual pathway model, we predict that individuals are most likely to respond to the climate crisis by feeling *fear* (and not anger).

Emotion-focused approach coping with this fear should lead individuals to take action to reduce these future negative consequences.

Our prediction regarding fear is broadly consistent with theory and research on the effectiveness of fear appeals in the health literature (Witte & Allen, 2000). This work suggests that making individuals aware of the negative future consequences of their current health behavior (e.g., smoking) leads to individual behavioral change. Witte and Allen (2000) extensive meta-analysis of fear appeals suggests, however, that fear appeals can have counterproductive effects as well. In line with previous theorizing (Rogers, 1975), individuals can respond to fear appeals by rejecting the message and denying the danger because they find themselves unable to translate their fear into action. More specifically, Witte and Allen (2000) found that strong self-efficacy beliefs lead individuals to deal with the fear appeal in a way to control the actual danger (e.g., accept the danger and change one's behavior), whereas weak self-efficacy beliefs lead individuals to deal with it in a way to control their fear (e.g., avoid, ignore, or reject the danger)².

Although we have no doubt that individuals' self-efficacy beliefs are key to individual actions to solve individual problems (e.g., changing one's health behavior), such beliefs should be much less relevant for collective actions that solve problems perceived as collective (e.g., the climate crisis). Indeed, group-based coping requires individuals to focus on their collective rather than their individual-level resources (Ellemers, 1993; Klandermans, 1997; Tajfel & Turner, 1979; Van Zomeren, Postmes, et al., 2008). In line with this idea, Homburg and Stolberg (2006) showed in a series of correlational studies that group efficacy beliefs, but not self-efficacy beliefs, were associated with environmental behavior³. Based in the dual pathway model, we predict that individuals can be motivated for environmental action through their group efficacy beliefs independent of their feelings of fear because these are two relatively independent types of approach coping (Lazarus, 1991, 2001; Van Zomeren et al., 2004; Van Zomeren, Leach, et al., 2010; Van Zomeren, Spears, et al., 2008, 2010). More specifically, lower group efficacy beliefs inhibit the motivation that fear raises, whereas higher group efficacy beliefs increase such motivation. Thus, viewing the climate crisis as a collective problem that requires collective action requires a different theoretical model than viewing it as an individual problem that requires individual action to solve it.

4. Hypotheses and overview

In two experiments we tested whether fear, and self- or group efficacy beliefs, increase individuals' intentions of environmental action in the context of the climate crisis. The dual pathway model suggests that fear (as a form of emotion-focused coping) and group efficacy (as a form of problem-focused coping) are distinct pathways by which individuals can cope with the climate crisis by approaching this problem. Thus, the dual pathway model expects self-efficacy beliefs to play little role in increasing environmental action intentions.

By contrast, Witte and Allen (2000) fear appeal model predicts an interaction between fear and self-efficacy such that the positive effects of fear only occur when individuals have high self-efficacy.

These competing hypotheses were examined in Experiment 1. In Experiment 2 we conducted a more direct test of the dual pathway model by manipulating fear and group efficacy beliefs. Here the dual pathway model predicts two distinct main effects of fear and group efficacy on environmental action intentions (indicative of emotion-focused and problem-focused approach coping, respectively). The combination and design of our two experiments thus allow for a test of the unique validity of the dual pathway model vis-à-vis a more individualistic fear appeal model. Moreover, employing experimental research is important because it is the only way to determine causal relationships that are otherwise often only theorized or assumed to flow in a specific direction (e.g., the link between group efficacy and environmental action intentions).

5. Experiment 1

5.1. Method

5.1.1. Participants and design

One-hundred-and-five students (85 women, 20 men; mean age 19.60 years) participated in an experiment at the University of Groningen for required course credit. The experiment was disguised as a large-scale survey about "your perceptions of the environment". Participants were randomly allocated to one of the four conditions of the experiment that constitute a 2 (Fear Information: Yes/No) × 2 (Self-efficacy Information: Yes/No) factorial design. Participants read a text about the climate crisis and its negative future consequences (in the fear condition), or only about the climate crisis (in the no fear condition). Subsequently, they read a text about what one could individually do to contribute to a solution of the climate crisis (in the self-efficacy condition), or they did not receive this information (in the no self-efficacy condition). All texts were constructed through combining information about the climate crisis from various websites. The information was supposedly provided by the Intergovernmental Panel on Climate Change, whose logo was shown on each page, to make it more credible. After reading about the climate crisis, participants responded to the questions of the (bogus) survey that included our key dependent measure (i.e., environmental action intentions). Finally, participants received their course credit and were debriefed.

5.1.2. Procedure

All participants read the following: "In the last decennia, the amount of carbon dioxide (CO₂) in the atmosphere has increased exponentially. The main cause of this is the use of fossil fuels. These are used for transport (e.g., driving a car), electricity, the heating of houses, and the industry. The increase in CO₂ in the atmosphere has resulted in an increase in the average temperature on Earth. Its consequence is climate change. In the past 100 years, the climate on Earth has warmed .6° C." In the no fear condition, this was all the information provided about the climate crisis. In the fear condition, however, the text continued thus: "This may appear to be a small increase, but even a small increase in the average temperature can cause global problems for humans, animals, and vegetation. Everywhere we see the first major consequences of this global warming: Large fires, huge floods, melting glaciers, and unprecedented heat waves. The Intergovernmental Panel on Climate Change (IPCC) warns that if nothing is done about this climate crisis, it will be very hard to prevent or even constrain its negative future consequences. This means that the actions we will undertake in the upcoming years will determine what kind of world we will leave behind for our children and our children's children."

In the no self-efficacy condition, there was no further information. In the self-efficacy condition, however, participants read the following: "According to the IPCC, the climate crisis is not an

² In the language of our coping perspective, we view such responses as indicators of emotion-focused avoidance coping (Van Zomeren, Leach, et al., 2010).

³ Although Homburg and Stolberg (2006) documented evidence for problem-focused coping processes in the domain of environmental behavior, they did not focus on emotion-focused coping processes that are core to Lazarus (1991) theorizing. The dual pathway model thus offers a more integrative and complete coping model in the context of the climate crisis.

Table 1A

Means and standard deviations of the key dependent variables by experimental condition.

| | Fear | | No Fear | |
|---|---------------|------------------|---------------|------------------|
| | Self-efficacy | No self-efficacy | Self-efficacy | No self-efficacy |
| 1. Fear | | | | |
| M | 4.29 | 3.63 | 3.41 | 3.20 |
| SD | 1.43 | 1.24 | 1.46 | 1.49 |
| 2. Anger | | | | |
| M | 2.98 | 2.91 | 2.69 | 3.81 |
| SD | 1.36 | 1.39 | 1.02 | 1.48 |
| 3. Self-Efficacy | | | | |
| M | 4.93 | 4.04 | 4.37 | 2.69 |
| SD | 1.13 | 1.19 | 1.25 | 1.03 |
| 4. Group efficacy | | | | |
| M | 5.60 | 5.09 | 5.32 | 5.40 |
| SD | 1.00 | 1.42 | 1.31 | 1.33 |
| 5. Environmental action intentions | | | | |
| M | 3.96 | 4.30 | 3.62 | 3.64 |
| SD | 1.50 | 1.20 | 1.38 | 1.56 |

unsolvable problem. Many experts share this opinion. For example, according to Prof. Harald Neumann, an independent climate expert from Stanford University, individuals can prevent the negative future consequences of the climate crisis by changing their own behavior." This was followed by a list of actions that individuals can take to contribute to solving the problem of the climate crisis (e.g., buy products that are low on energy consumption, reduce your own CO₂ output, buy from "green" companies, vote for "green" parties).

5.1.3. Dependent variables

All measures applied 7-point response scales (1 = *not at all*, 7 = *very much*). All items that were predicted to indicate the same construct were presented in a randomized order. As a check of the fear manipulation, we measured fear of the future negative consequences of the climate crisis with 2 items ($r = .70, p < .01$; "I am fearful/afraid of the negative future consequences of the climate crisis"). In a similar fashion, we also measured anger about the future negative consequences of the climate crisis with three items ($\alpha = .88$; "I feel angry/furious/mad because of the negative future consequences of the climate crisis"). As a check of the self-efficacy manipulation, we measured individuals' self-efficacy beliefs with five items ($\alpha = .92$; "There are simple things I can do that reduce the negative consequences of the climate crisis"/"I can change my daily routines to combat the climate crisis"/"There are things I can do that can make a difference in reducing the negative consequences of the climate crisis"/"My individual actions will contribute to a solution of the climate crisis"/"Changes in my daily routines will contribute to reducing the negative consequences of the climate crisis"). We also measured individuals' group efficacy beliefs with three items ($\alpha = .94$; "To what extent do you think that people can jointly prevent the negative consequences of the climate crisis?"/"To what extent do you think that individuals can collectively stop the negative consequences of the climate crisis?"/"To what extent do you think that people can together, through joint effort, achieve the goal of preventing the negative consequences of the climate crisis?"). Finally, we measured environmental action intentions with three items ($\alpha = .86$; "I would like to do something together with others to fight the climate crisis/I would like to sign a petition to promote measures against the climate crisis/I will vote for a political party that fights against the climate crisis").

5.2. Results

Table 1A summarizes the means and standard deviations of the key variables by experimental condition, and Table 1B summarizes the correlations between these variables.

Table 1B

Correlations between dependent variables, Experiment 1.

| | 2. | 3. | 4. | 5. |
|------------------------------------|------|------|------|------|
| 1. Fear | .32* | .51* | .35* | .49* |
| 2. Anger | | .34* | .12 | .30* |
| 3. Self-efficacy | | | .56* | .48* |
| 4. Group efficacy | | | | .47* |
| 5. Environmental action intentions | | | | |

Note: * Represents $p < .05$.

5.2.1. Manipulation checks

As a check of the fear manipulation, an analysis of variance (ANOVA) with fear and self-efficacy as the independent variables and fear as the dependent variable showed a significant main effect of the fear manipulation, $F(1, 101) = 5.37, p < .03, \eta^2 = .05$. The main effects of self-efficacy, $F(1, 101) = 2.32, p > .13, \eta^2 = .02$, and the two-way interaction, $F(1, 101) = .64, p > .42, \eta^2 = .01$, were not significant. As intended, inspection of the means revealed stronger fear in the fear conditions ($M = 3.92, SD = 1.35$) than in the no fear conditions ($M = 3.33, SD = 1.46$). Thus, our manipulation was successful. This conclusion was further corroborated by a lack of main effect of fear on individuals' feelings of anger about the same situation, $F(1, 101) = .67, p > .41, \eta^2 = .01$. The other effects were not significant either: $F(1, 101) = .01, p > .97, \eta^2 = .00$, for the main effect of self-efficacy, and $F(1, 101) = .10, p > .75, \eta^2 = .00$, for the two-way interaction. Generally, and in line with our analysis, individuals felt more fear ($M = 3.60, SD = 1.44$) than anger ($M = 2.83, SD = 1.26$), $t(104) = 5.01, p < .01$.

Another ANOVA with fear and self-efficacy as the independent variables and self-efficacy as the dependent variable showed a significant main effect of the self-efficacy manipulation, $F(1, 101) = 8.14, p < .01, \eta^2 = .08$. The main effect of fear and the two-way interaction were not significant: $F(1, 101) = 2.49, p > .12, \eta^2 = .02$, and, $F(1, 101) = .43, p > .51, \eta^2 = .00$, respectively. As intended, inspection of the means revealed stronger self-efficacy beliefs in the self-efficacy conditions ($M = 4.57, SD = 1.23$) than in the no self-efficacy conditions ($M = 3.94, SD = 1.31$). Thus, our self-efficacy manipulation was successful. This conclusion was corroborated by the absence of a main effect of self-efficacy on individuals' group efficacy beliefs, $F(1, 101) = .70, p > .41, \eta^2 = .01$. The other effects were not significant either: $F(1, 101) = .01, p > .96, \eta^2 = .00$, for the main effect of fear, and $F(1, 101) = 1.35, p > .25, \eta^2 = .01$, for the two-way interaction. Generally, individuals had stronger group efficacy ($M = 5.33, SD = 1.28$) than self-efficacy beliefs ($M = 4.29, SD = 1.30$), $t(104) = 8.78, p < .01$.

5.2.2. Hypothesis testing

The dual pathway model predicts only a main effect of fear on environmental action intentions. By contrast, the fear appeal model predicts a two-way interaction between fear and self-efficacy, such that environmental action intentions should be highest in the condition where there is fear and strong self-efficacy beliefs.

We tested these hypotheses by performing an ANOVA with fear and self-efficacy as the independent variables and environmental action intentions as the dependent variable. As predicted by the dual pathway model, the results showed only a significant main effect of fear, $F(1, 101) = 4.43, p < .04, \eta^2 = .04$. The main effect of self-efficacy was not significant, $F(1, 101) = .40, p > .83, \eta^2 = .00$, and, contradicting the alternative hypothesis, the two-way interaction effect was not significant either, $F(1, 101) = .63, p > .42, \eta^2 = .01$. As predicted, inspection of the means revealed stronger

environmental action intentions in the fear conditions ($M = 3.85$, $SD = 1.31$) than in the no fear conditions ($M = 3.30$, $SD = 1.43$).

5.2.3. Testing the dual pathway model

We then tested the idea that fear increases environmental action intentions in addition to group efficacy beliefs, as two different ways of coping with the climate crisis. We therefore regressed environmental action intentions onto the fear manipulation (dummy-coded) and group efficacy. The model was significant ($F = 16.72$, $p < .01$), with an explained variance of 25%. In line with the dual pathway model, both the fear manipulation ($\beta = .20$, $p < .02$) and the group efficacy measure ($\beta = .46$, $p < .01$) predicted environmental action intentions⁴.

5.3. Discussion

The results of this experiment provided the first support for our application of the dual pathway model of coping with collective disadvantage to the climate crisis. Having conceptualized the climate crisis as a collective problem and environmental action as collective action against it, Experiment 1 showed that (manipulated) fear and (measured) group efficacy beliefs predicted environmental action intentions as two different (emotion- and problem-focused) approach-oriented ways to cope with the climate crisis. Interestingly, manipulated self-efficacy beliefs did neither affect individuals' fear, nor their group efficacy beliefs. Moreover, results did not show support for the alternative hypothesis that predicts a two-way interaction between fear and self-efficacy beliefs. Thus, results were in line with predictions from our dual pathway analysis, but they were not in line with a more individualistic theoretical account.

However, Experiment 1 had a number of limitations that might warrant some caution in interpreting the results. First, group efficacy beliefs were measured and not manipulated in Experiment 1, and hence some caution is warranted in interpreting the predicted causal relationship between group efficacy and environmental action intentions. Therefore, we manipulated group efficacy in Experiment 2. Second, although the fear and self-efficacy manipulations affected only fear and self-efficacy, respectively, our measures of fear and self-efficacy were positively correlated. We believe that is due to the conceptual overlap between self-efficacy and group efficacy beliefs, which affected environmental action intentions in the same direction as fear (i.e., both increased environmental action intentions). Indeed, the dual pathway model does not suggest that indicators of emotion- and problem-focused approach coping are necessarily *uncorrelated*. Rather, it is their *effects* that should be independent (hence providing two distinct "pathways" to action; Van Zomeren et al., 2004; for a review see Van Zomeren, Leach, et al., 2010). We therefore manipulated *both* fear and group efficacy beliefs in Experiment 2.

Moreover, in Experiment 2 we moved closer to real-life fear appeals (such as *An inconvenient truth*) by combining the Experiment 1 fear manipulation with a short movie clip about the negative future consequences of the climate crisis. Thus, Experiment 2 aimed to gather more support for the dual pathway model by replicating the Experiment 1 fear effect on environmental action intentions while also establishing the causal effect of group efficacy on these intentions.

⁴ In a preliminary analysis, we assessed whether self-efficacy beliefs added to the explanation of environmental action intentions. This was not the case – regressing environmental action intentions onto the fear, group efficacy and self-efficacy variables showed that whereas fear ($\beta = .32$, $p < .01$) and group efficacy ($\beta = .19$, $p < .07$) predicted environmental action intentions, self-efficacy did not ($\beta = .14$, $p > .19$).

6. Experiment 2

6.1. Method

6.1.1. Participants and design

Seventy-eight students (64 women, 14 men; mean age 20.76 years) participated in an experiment at the University of Groningen (The Netherlands) for required course credit. The experiment was disguised as a large-scale survey about "your perceptions of the environment". Participants were randomly allocated to one of the four conditions of the experiment that constitute a 2 (Fear Information: Yes/No) \times 2 (Group Efficacy Information: Yes/No) factorial design. They read a text about the climate crisis and its negative future consequences and also saw these consequences visualized in a video clip (in the fear condition), or they only read the text about the climate crisis without the video clip (in the no fear condition). Subsequently, they read a text about what individuals across the world are doing collectively to contribute to a solution of the climate crisis (in the group efficacy condition), or they did not receive this information (in the no group efficacy condition). As in Experiment 1, all texts were supposedly provided by the Intergovernmental Panel of Climate Change to make the information more credible. Afterwards, they responded to the questions of the (bogus) survey that included our key dependent measure (i.e., environmental action intentions). Finally, participants were debriefed.

6.1.2. Procedure

Compared to Experiment 1, the basic text used in the fear manipulation was similar to Experiment 2. To bring the manipulation closer to real-life, we included a video clip in the fear condition that depicted, as in *An inconvenient truth*, images of retreating glaciers, melting arctic ice, and the rise of water levels around the world. Specifically, we made these effects more psychologically real by relating these pictures to black-and-white images of the 1953 great flooding in the Netherlands, followed by text asking "Are we on time? Or are we too late again?", and a subsequent satellite image of the Netherlands that showed which parts of the country would be flooded as a consequence of the climate crisis. The movie clip lasted for about a minute, and was accompanied by dramatic music that participants could hear through a headphone.

The group efficacy manipulation went as follows: "According to the IPCC, the climate crisis is not an unsolvable problem: 'It is certain that we can solve this collective problem – we're not too late yet. Actually, the technological solutions for the climate crisis are already available. But we must choose to make use of them, and keep doing this! Fortunately, people across the world are showing us that we can do this. Governments work together to take the appropriate measures. Many communities already contribute to an effective solution of the climate crisis. For example, in The Netherlands, more than 100,000 households have become energy-neutral. This means we are on the right track. Together, we can prevent the negative future consequences of the climate crisis.'"

6.1.3. Dependent variables

All measures applied 7-point response scales (1 = *not at all*, 7 = *very much*). Because the Experiment 2 data were collected through paper-and-pencil questionnaires, all items were presented in a fixed order. As a check of the fear manipulation, we measured fear of the negative future consequences of the climate crisis with the same two items used in Experiment 1 ($r = .70$, $p < .01$). As a check of the group efficacy manipulation, we measured individuals' group efficacy beliefs with the same three items as in Experiment 1 ($a = .79$). Finally, we measured environmental action intentions with the three items used in Experiment 1 ($a = .76$).

Table 2A

Means and standard deviations of the key dependent variables by experimental condition.

| | Fear | | No Fear | |
|---|----------------|-------------------|----------------|-------------------|
| | Group efficacy | No Group efficacy | Group efficacy | No Group efficacy |
| 1. Fear | | | | |
| M | 3.13 | 3.50 | 2.53 | 2.18 |
| SD | 1.35 | 1.61 | 1.62 | .91 |
| 2. Group efficacy | | | | |
| M | 5.02 | 4.68 | 5.17 | 4.42 |
| SD | 1.32 | 1.11 | 1.02 | 1.30 |
| 3. Environmental action intentions | | | | |
| M | 5.18 | 4.48 | 4.59 | 3.95 |
| SD | .98 | 1.13 | 1.16 | 1.44 |

6.2. Results

Table 2A summarizes the means and standard deviations of the key variables by experimental condition, and Table 2B summarizes the correlations between these variables.

6.2.1. Manipulation checks

As a check of the fear manipulation, an ANOVA with fear and group efficacy as the independent variables and fear as the dependent variable showed a significant main effect of the fear manipulation, $F(1, 74) = 9.22, p < .01, \eta^2 = .11$. The main effect of group efficacy and the two-way interaction were not significant ($F(1, 74) = .00, p > .97, \eta^2 = .00$, and $F(1, 74) = 1.32, p > .25, \eta^2 = .02$). As intended, inspection of the means revealed stronger fear in the fear conditions ($M = 3.31, SD = 1.48$) than in the no fear conditions ($M = 2.34, SD = 1.29$) than in the no fear conditions. Thus, our manipulation was successful.

Another ANOVA with fear and group efficacy as the independent variables and group efficacy as the dependent variable showed a significant main effect of the group efficacy manipulation, $F(1, 74) = 3.98, p < .05, \eta^2 = .05$. The main effect of fear and the two-way interaction were not significant: $F(1, 74) = .05, p > .83, \eta^2 = .00$, and $F(1, 74) = .58, p > .44, \eta^2 = .00$, respectively. As intended, inspection of the means revealed stronger group efficacy beliefs in the group efficacy conditions ($M = 5.09, SD = 1.18$) than in the no group efficacy conditions ($M = 4.55, SD = 1.20$). Thus, our group efficacy manipulation was successful.

6.2.2. Hypothesis testing

In this study, the dual pathway model predicts main effects of fear and group efficacy on environmental action intentions. We tested these hypotheses by performing an ANOVA with fear and group efficacy as the independent variables and environmental action intentions as the dependent variable. As predicted by the dual pathway model, the results showed a significant main effect of fear, $F(1, 74) = 4.34, p < .05, \eta^2 = .06$, and a significant main effect of group efficacy, $F(1, 74) = 6.19, p < .02, \eta^2 = .08$. The two-way interaction effect was not significant, $F(1, 74) = .01, p > .92, \eta^2 = .00$. Replicating Experiment 1, there were stronger levels of environmental action intentions in the fear conditions ($M = 4.83, SD = 1.10$)

Table 2B

Correlations between dependent variables, Experiment 2.

| | 2 | 3 |
|------------------------------------|-----|------|
| 1. Fear | .17 | .34* |
| 2. Group efficacy | | .72* |
| 3. Environmental action intentions | | |

Note: *Represents $p < .05$.

than in the no fear conditions ($M = 4.25, SD = 1.34$). Moreover, and corroborating the Experiment 1 findings regarding group efficacy, there were stronger levels of environmental action intentions in the group efficacy conditions ($M = 4.90, SD = 1.10$) than in the no group efficacy conditions ($M = 4.22, SD = 1.30$).

6.3. Discussion

The Experiment 2 findings show more support for the dual pathway model of coping with collective disadvantage as applied to the climate crisis. First, the Experiment 2 results replicate the effect of fear on environmental action intentions, which is indicative of emotion-focused approach coping with the climate crisis. Interestingly, the use of the movie clip resulted in a stronger manipulation (as indicated by the larger effect size in Experiment 2 compared to that of Experiment 1). Second, Experiment 2 documents causal evidence for the effect of group efficacy on environmental action intentions, which is indicative of problem-focused approach coping with the climate crisis. This corroborates the Experiment 1 results and establishes the hypothesized causal direction of the effect. Moreover, both results support the dual pathway model of coping with collective disadvantage, and emphasize the benefits of viewing the climate crisis as a collective problem that can be solved through collective action.

7. General discussion

7.1. Theoretical and practical implications

Theoretically, the results of this set of experiments have a number of important implications. A first implication is that the presumed psychological power of fear and group efficacy to increase individuals' environmental action intentions is real and important. Our results support and extend work on the dual pathway model of coping with collective disadvantage, which has found evidence for similar effects of anger and group efficacy on collective action intentions in the context of unfair collective disadvantage (e.g., Van Zomeren, Leach, et al., 2010; Van Zomeren et al., 2004; Van Zomeren, Spears, et al., 2008, 2010). The current results support the idea that environmental action can be viewed as collective action (e.g., Wright et al., 1990), and the climate crisis as a collective problem (Hardin, 1968; Olson, 1968). This conclusion is corroborated by the lack of support for predictions generated by a more individualistic account in this context (Leventhal, 1970; Rogers, 1975; Witte & Allen, 2000).

A second implication is that a theoretical coping perspective can be fruitful in mobilizing individuals for environmental action (see also Homburg & Stolberg, 2006). The notion of emotion-focused approach coping suggests that individuals can indeed cope by regulating their emotions (e.g., fear), which are based on specific appraisal of the situation (e.g., the negative future consequences of the climate crisis). Our results support the idea that fear can increase individuals' environmental action intentions, which we conceptualize as a form of emotion-focused approach coping (Van Zomeren, Leach, et al., 2010). Raising fear can therefore be quite effective in increasing such intentions. In addition, the notion of problem-focused approach coping suggests a type of regulation that incorporates information on the possibility to mobilize actions for the purpose of changing reality (Lazarus, 1991; Van Zomeren et al., 2004). Our results support the idea that it is group efficacy rather than self-efficacy that is most relevant in the context of the climate crisis. This is again in line with the idea that the climate crisis can be viewed as a collective problem that requires collective action.

Our results show a clear distinction between self-efficacy and group efficacy beliefs as proposed by Bandura (1995, 1997); see also Homburg and Stolberg (2006); Lam (2006). We think that, in general, self-efficacy is an equally important predictor of individual action as group efficacy is of collective action. Indeed, when individuals define a problem as an individual problem that requires individual action to solve it, self-efficacy should predict such action (and in line with the fear appeal model we expect it to moderate any fear effects). However, when the problem is defined as a collective problem that requires collective action to solve it, group efficacy should predict such action. Given the situational nature of the dual pathway model of coping with collective disadvantage, we suspect that the appraisal of negative future consequences does not only harm the self but also *fellow group members* is key in predicting whether the problem will be appraised as collective (and thus whether group efficacy beliefs become more relevant in coping with this collective problem). In the context of the climate crisis, for example, it might be the perception that its negative consequences impact on so many individuals that leads individuals to define the problem as collective. Future research could examine this critical moderator of the perception of a problem as individual or collective.

A more practical implication of the results is that they suggest that raising fear can be effective in increasing individuals' intentions to engage in action to solve a collective problem. In fact, the dual pathway model moves beyond this question by suggesting that organizers or other practitioners of environmental action should *also* try to raise individuals' group efficacy beliefs. This is not necessarily because group efficacy beliefs are required for the fear effect to occur, but because the two ways of coping are not mutually exclusive, and both propel individual toward stronger intentions to act. As such, lower group efficacy beliefs lower the motivation that fear raises, but higher group efficacy beliefs increase such motivation for the same reason. Viewing the climate crisis as a collective problem and making use of theoretical models that explain collective action thus results in clear practical recommendations to mobilize individuals to engage in environmental action.

7.2. Limitations and directions for future research

There are some limitations of the current set of studies. First, although experiments have the important advantage of strong internal validity (i.e., establishing the direction of causality in a relationship that was hitherto theorized or assumed to flow in a particular direction), one limitation of such studies is their relatively weak external validity. However, the dual pathway model has been successfully applied in different domains of collective action, such as the motivation to protest (e.g., Van Zomeren et al., 2004; Van Zomeren, Spears, et al., 2008, 2010), volunteerism (Thomas, 2005), and currently in the environmental domain. Together, this work establishes the strong external validity of the idea that there are emotion-focused and problem-focused pathways to collective action.

Second, one can argue that the current research does not tell us much about whether individuals will translate their intentions into actual behavior. However, classic theories of the attitude – behavior relationship predict that intentions are, generally, better predictors of action than attitudes or efficacy beliefs (e.g., Ajzen, 1991; Fishbein & Ajzen, 1975). Moreover, a meta-analysis of the collective action literature found smaller (but still significant) effects of predictors of actual collective action than of the same predictors of collective action intentions (Van Zomeren, Postmes, et al., 2008). Furthermore, in two of their studies Homburg and Stolberg (2006) reported positive and significant correlations between group efficacy and actual pro-environmental behavior. There is also recent evidence that the dual pathway variables

predict actual behavior (i.e., signing a petition against collective disadvantage; Van Zomeren, Postmes, & Spears, 2010). Taken together, all this work suggests some faith in whether individuals' intentions will predict their actual behavior.

Future research can study at least two challenges that our application of the dual pathway model identifies in the context of the climate crisis. First, research can further explore the problem-focused coping mechanism by examining the relationship between self-efficacy and group efficacy as a function of viewing the problem as individual or collective. It would be important and interesting to test whether framing the climate crisis as a collective or individual problem (for example by focusing on the negative future consequences for the self, or for the self and fellow group members) moderates the predictive value of self-efficacy and group efficacy. Thus, the first challenge is to discover conditions under which each type of efficacy increases environmental action intentions. Second, research can further explore the role of the emotion-focused approach coping mechanism by examining whether and how framing the situation in terms of different appraisals (e.g., from negative future consequences to injustice and blame) might evoke anger and thereby perhaps increase individuals' environmental action intentions even more (for discussions, see Iyer & Leach, 2008; Leach, Snider, & Iyer, 2002). For example, if one can invoke an out-group to be blamed for the injustice of the future negative consequences of the climate crisis, it would be interesting to see whether the feelings of anger that follow from it would be an even better predictor of environmental action intentions than feelings of fear. Indeed, at that stage the collective problem would resemble the unfair collective disadvantages that collective action research typically addresses (e.g., being discriminated, or having to pay higher taxes as a group), partly because a clear in-group/out-group categorization is present. Thus, the second challenge is to explore whether and when fear of the negative future consequences of the climate crisis turns into anger toward those responsible for these consequences.

7.3. Conclusion

In this article, we have offered a dual pathway model of coping with the climate crisis that has clear theoretical and practical relevance and advantages. For example, we believe that fear appeals (like *An inconvenient truth*) can motivate emotion-focused approach coping that increases individuals' intention to engage in environmental action, and that communicating strong group efficacy beliefs can motivate problem-focused approach coping that increases their intentions even more. We hope that our dual pathway model analysis of the climate crisis inspires more research into the many and different ways in which individuals cope with such collective problems, and into the similarities between the collective action and environmental action literatures.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Making Processes*, 50, 179–211.
- Austenfeld, J. L., & Stanton, A. L. (2004). Coping through emotional approach: a new look at emotion, coping, and health-related outcomes. *Journal of Personality*, 72, 1335–1363.
- Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 1–45). Cambridge, England: Cambridge University Press.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. (2000). Social-cognitive theory: an agentic perspective. *Annual Review of Psychology*, 52, 1–26.
- Crosby, F. J. (1976). A model of egotistical relative deprivation. *Psychological Review*, 83, 85–113.
- Davies, J. (1962). Toward a theory of revolution. *American Sociological Review*, 27, 5–18.

- Davis, J. A. (1959). A formal interpretation of the theory of relative deprivation. *Sociometry*, 22, 280–296.
- Ellemers, N. (1993). The influence of socio-structural variables on identity management strategies. In W. Stroebe, & M. Hewstone (Eds.), *European review of social psychology*, Vol. 4 (pp. 22–57). Oxford: Blackwell.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior*. Reading, MA: Addison-Wesley.
- Folkman, S., & Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annual Review of Psychology*, 55, 745–774.
- Gamson, W. A. (1975). *The strategy of social protest*. Homewood, ILL: The Dorsey Press.
- Gore, A. (2006). *An inconvenient truth: The crisis of global warming*. New York: Rodale Books.
- Gurr, T. R. (1970). *Why men rebel*. Princeton: University Press.
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162, 1243–1248.
- Homburg, A., & Stolberg, A. (2006). Explaining pro-environmental behavior with a cognitive theory of stress. *Journal of Environmental Psychology*, 26, 1–14.
- Iyer, A., & Leach, C. W. (2008). Emotion in inter-group relations. *European Review of Social Psychology*, 19, 86–125.
- Kawakami, K., & Dion, K. L. (1992). The impact of salient self-identities on relative deprivation and action intentions. *European Journal of Social Psychology*, 23, 525–540.
- Klandermans, B. (1984). Mobilization and participation: social-psychological expansions of resource mobilization theory. *American Sociological Review*, 49, 583–600.
- Klandermans, B. (1997). *The social psychology of protest*. Oxford: Basic Blackwell.
- Lam, S. (2006). Predicting intention to save water: theory of planned behavior, response efficacy, vulnerability, and perceived efficiency of alternative solutions. *Journal of Applied Social Psychology*, 36, 2803–2824.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Lazarus, R. S. (2001). Relational meaning and discrete emotions. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods and research*. Oxford: University Press.
- Leach, C. W., Snider, N., & Iyer, A. (2002). "Spoiling the consciences of the fortunate": the experience of relative advantage and support for social equality. In I. Walker, & H. J. Smith (Eds.), *Relative deprivation: Specification, development, and integration* (pp. 136–163). New York: Cambridge University Press.
- Leventhal, H. (1970). Findings and theory in the study of fear communications. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 119–186). New York: Academic Press.
- McAdam, D. (1982). *Political processes and the development of black insurgency*. Chicago: University Press.
- McCarthy, J. D., & Zald, M. N. (1977). Resource mobilization and social movements: a partial theory. *American Journal of Sociology*, 82, 1212–1241.
- Major, B. (1994). From social inequality to personal entitlement: the role of social comparisons, legitimacy appraisals, and group membership. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, Vol. 26 (pp. 293–355). San Diego, CA: Academic Press.
- Moser, S. C., & Dilling, L. (2004). Making climate change hot: communicating the urgency and challenge of global climate change. *Environment*, 46, 32–46.
- Mummendey, A., Kessler, T., Klink, A., & Mielke, R. (1999). Strategies to cope with negative social identity: predictions by social identity theory and relative deprivation theory. *Journal of Personality and Social Psychology*, 76, 229–245.
- Olson, M. (1968). *The logic of collective action: Public goods and the theory of groups*. Cambridge: Harvard University Press.
- Postmes, T., Branscombe, N. R., Spears, R., & Young, H. (1999). Comparative processes in personal and group judgments: resolving the discrepancy. *Journal of Personality and Social Psychology*, 76, 320–338.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology*, 91, 93–114.
- Runciman, W. G. (1966). *Relative deprivation and social justice: A study of attitudes to social inequality in twentieth-century England*. Berkeley: University of California Press.
- Scherer, K. R., Schorr, A., & Johnstone, T. (2001). *Appraisal processes in emotion*. Oxford: Oxford University Press.
- Stanton, A. L., Danoff-Burg, S., Cameron, C. L., & Ellis, A. P. (1994). Coping through emotional approach: problems of conceptualization and confounding. *Journal of Personality and Social Psychology*, 66, 350–362.
- Steg, L. (2003). Motives and behavior in social dilemmas relevant to the environment. In L. Hendrickx, W. Jager, & L. Steg (Eds.), *Human decision making and environmental perception. Understanding and assisting human decision making in real-life settings* (pp. 83–102). Groningen: University of Groningen.
- Steg, L., & Vlek, C. (2008). Encouraging pro-environmental behavior: an integrative review and research agenda. *Journal of Environmental Psychology*, 12, 1–9.
- Stouffer, S. A., Suchman, E. A., DeVinney, L. C., Star, S. A., & Williams, R. M. (1949). *The American soldier. In: Adjustment during army life, Vol. 1*. Princeton, NJ: Princeton University Press.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of inter-group conflict. In W. G. Austin, & S. Worchele (Eds.), *The social psychology of inter-group relations* (pp. 33–47). Monterey, CA: Brooks/Cole.
- Thomas, E. F. (2005). The role of social identity in creating positive beliefs and emotions to motivate volunteerism. *The Australian Journal of Volunteering*, 2, 45–52.
- Tilly, C. (1978). *From mobilization to revolution*. Reading, MA: Addison-Wesley.
- Van Zomeren, M., & Iyer, A. (2009). Introduction to the social and psychological dynamics of collective action. *Journal of Social Issues*, 65, 645–660.
- Van Zomeren, M., Leach, C. W., & Spears, R. (2010). A dynamic dual pathway model of coping with collective disadvantage. Unpublished manuscript.
- Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin*, 134, 504–535.
- Van Zomeren, M., Postmes, T., & Spears, R. (2010). On conviction's collective consequences: Integrating moral conviction with a social identity model of collective action. Manuscript under review.
- Van Zomeren, M., Spears, R., Fischer, A. H., & Leach, C. W. (2004). Put your money where your mouth is!: explaining collective action tendencies through group-based anger and group efficacy. *Journal of Personality and Social Psychology*, 87, 649–664.
- Van Zomeren, M., Spears, R., & Leach, C. W. (2008). Exploring psychological mechanisms of collective action: does relevance of group identity influence how people cope with collective disadvantage? *British Journal of Social Psychology*, 47, 353–372.
- Van Zomeren, M., Spears, R., & Leach, C. W. (2010). Does group efficacy increase group identification? Resolving their paradoxical relationship. Manuscript under review.
- Walker, I., & Smith, H. J. (2002). *Relative deprivation: Specification, development, and integration*. Cambridge: University Press.
- Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: implications for effective public health campaigns. *Health Education & Behavior*, 27(5), 608–632.
- Wright, S. C., Taylor, D. M., & Moghaddam, F. M. (1990). Responding to membership in a disadvantaged group: from acceptance to collective protest. *Journal of Personality and Social Psychology*, 58, 994–1003.