Using A Fear Appeal During Two Crises

The Influence of Fear and Collective Efficacy on Sustainable Intentions During the Corona- and

Climate Change Crisis

Esther S. Maso

Department of Social, Health and Organisational Psychology, Utrecht

**FACULTY OF
SOCIAL AND
BEHAVIOURAL SCIENCES**

Email: e.s.maso@students.uu.nl
Student number: 6857507
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Abstract

In climate change communication fear is frequently used to encourage sustainable behaviour. Using fear to persuade people into performing certain behaviour is a technique known as a fear-appeal. It is often used and studied in health psychology, but so far little studies have been done in environmental psychology. A fear appeal usually consist of a threatening component and recommendation with protective action towards that threat. Since health psychology usually targets individual behaviour, this recommendation is aimed at increasing self-efficacy but since climate change is a complex global problem that needs collective action, it is argued that aiming to increase collective efficacy would be more effective. However, in climate change communication a efficacy component is often lacking. Two models that theorize different interdependency for the effects of fear and efficacy are discussed: The Extended Parallel Process Model and The Dual Pathway Model of Collective Disadvantage. Hypothesized is that a fear appeal would increase sustainable intentions and that a fear appeal would have more effect than an appeal with just fear or efficacy. 244 participants were randomly assigned to four conditions in a 2x2 design, where fear and collective efficacy were manipulated. No significant results were found to support the hypotheses, possible due to no significant effects of the manipulations. The influence of the threat of the 2020 coronavirus, as a possible accelerator in the system change needed to combat the climate crisis is discussed, as well as reframing the climate change message and the connection between health- and environmental psychology.

Keywords: fear appeal, climate change communication, collective efficacy, coronavirus

Using A Fear Appeal During Two Crises

The 2020 coronavirus outbreak caught everyone's attention, but at the same time the urgency of the climate change crisis remains. While countries all over the world are coping with the impact of the coronavirus, the crisis it brought on could potentially help in accelerating action needed for the climate crises. Due to the imposed lockdowns, there was a discernible improvement on air quality in many countries all over the globe. This gave people a first-hand impression on the polluting influence of humans, on their day-to-day environment. It also made visible what collective action is able to accomplish.

Unlike the sudden outbreak of coronavirus, environmental issues have had a much longer build-up. More than forty years ago, climate scientists started ringing the alarm about the urgency of climate change trends, and their foreseen consequences are becoming more and more apparent. Longer and more often occurring heat waves, intense and frequent precipitation, more frequently occurring hurricanes and rising sea levels; causing potential harm to habitats, industries and food production (IPCC, 2014). To prevent further irreversible impact, it is essential that we are going to 'bend the curve' as stated by Ramanathan et al. in 2016, and change the upward course of greenhouse gas emissions to a downward course (IPCC, 2014). Proposed solutions are currently largely dominated by technological innovation, for example; developing cleaner energy sources, cleaner ways of transport, enhancing the durability of products and designing more closed loop production cycles. The director of Urgenda, Marjan Minnesma, states that there are no technical obstructions anymore to have a completely sustainable energy supply in 2030 (Minnesma, 2014), which raises the question if this emphasis on technology is justified. As human influence is the most dominant factor of the observed global warming since the 1950s (IPCC, 2014), it's maybe more important to focus on increasing citizen engagement and accomplishing a change in human behaviour (Spence & Pidgeon, 2009).

Although more and more people worldwide are becoming aware that the way the world is currently depending on fossil fuels is not future-proof (Pew Research, 2018), the transition towards more sustainable energy consumption is difficult. It would need a system change that involves fundamental alterations in terms of assumptions, practices and rules (Michaelis, 2003; Moser & Dilling, 2007; Rotmans et al., 2001). Although normally moving very gradually, such a transition could be accelerated by unexpected or one-off events that act as an tipping point: the moment when a phenomenon that is only slowly moving forward, suddenly takes a drastic

acceleration and spreads to the majority (Gladwell, 2000; Moser & Dilling, 2007; Rotmans et al., 2001). This event could emerge from a societal development that has nothing to do with climate change, like the oil crises or an accident like Chernobyl (Rotmans et al., 2001). Perhaps the impact of the collective action taken to 'flatten the curve' of the coronavirus, can serve as an example of what is needed and what is possible to change the trajectory of the changing climate. If so, the right communication is needed to facilitate the desired social change and to encourage more people towards pro-environmental behaviour (Moser & Dilling, 2007).

Fear Appeals

Policy-makers and journalists rely heavily on information-based approaches and mass media communication when trying to excite the public into action and assume people will change their behaviour when they are provided with the right information (Wakefield et al., 2010). But how this information is framed, by emphasizing certain elements of the message or presenting them in a certain way, can influence its effectiveness and result in different responses (Bertolotti & Catellani, 2014; De Vreese, 2005; Nisbet, 2009). For example a study by Gifford and Comeau (2011) demonstrated that motivational framing of a message had a larger effect on sustainable intentions than sacrifice message framing. In climate change communication, a popular way of framing information is using threatening language and images (Hulme, 2007; Moller et al., 2006). Campaigners and journalists reason that by using fear, people will grasp the urgency of the problem and will therefore be most inclined to act and will start behaving differently (Griskevicius et al., 2012; Kundzewicz et al., 2020). Dramatic examples, like extreme weather events, are considered 'newsworthy' and are expected to attract the most attention (Bennett, 2016; Ereaut & Segnit, 2006). These threatening messages concerning climate change are most commonly constructed through the 'alarmist repertoire'- using inflated or extreme lexicon; 'terrible', 'immense', and 'beyond human control'. This repertoire can be seen from newspapers and tabloids to campaign literature from the government and environmental groups (Ereaut & Segnit, 2006). In a search on coverage of the IPCC-report of 2007 in British media, Hulme (2007) found frontpage headlines in quality newspapers that said: 'Final Warning!' and 'Worse than we thought!', and framed the message using terms like 'catastrophic' or 'devastating', while none of these words are used in the original report. Apart from using this alarmist repertoire, messages about climate change are often accompanied by fearsome images,

some of which have become iconic, like the starving polar bear stranded on an ice floe or the dark smoke coming from factories (O'Neill et al., 2013).

Arousing fear to persuade people to change their behaviour is a technique that is known as a 'fear appeal', and is used in many areas of health communication. A well-known example is the textual and/or graphic warnings on cigarette packages, used to discourage people from smoking. A fear appeal is defined as: "persuasive communication that tries to scare people into changing their attitudes, by conjuring up negative consequences that will occur, if they do not comply with the message recommendations" (Perloff, 2003, p.187). A fear appeal usually consists of a threatening message (the fear part) and a recommendation to neutralize the threat (the efficacy part). In the field of health psychology, the effect of fear appeals has been extensively researched in several meta-analyses (Peters et al., 2013; Tannenbaum et al., 2015; Witte & Allen, 2000), which have drawn different conclusions about how effective a fear appeal is in changing behaviour, but all show the importance of the inclusion of a recommendation about protective action.

Efficacy

The recommendation in the message of fear appeals in the health domain, is usually aimed at increasing two dimensions of efficacy: response efficacy and self-efficacy. Response efficacy is "one's beliefs about whether the recommended response works in averting the threat" and self-efficacy is "one's beliefs about his or her ability to perform the recommended response" (Witte & Allen, 2000, p.592). While health communication is usually aimed at individual behaviour, the climate crises is a problem that is not solvable by the actions of one individual member, but needs collective efforts aimed at the same interest by a larger group (Jugert et al., 2016; Kerr & Kaufman-Gilliland, 1997; Van Zomeren et al., 2010). Therefore, instead of including a self-efficacy in a fear appeal, it might be more effective to focus on collective efficacy: "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p. 477). This definition of collective efficacy implies both efficacy dimensions, self- and response efficacy, as it addresses perceived group ability and effectiveness of the collective action (Chen, 2015). Several studies found support that collective efficacy is indeed a better indicator of people's reported pro-environmental behaviour than self-efficacy (Chen, 2015; Homburg & Stolberg, 2006; Van Zomeren et al., 2010) but so far the importance of collective efficacy in relation to

sustainable behaviour has been largely overlooked (Chen, 2015).

While meta-analyses on fear appeals (Peters et al., 2013; Tannenbaum et al., 2015; Witte & Allen, 2000) show it's important to include an efficacy component next to a threatening message, it is often lacking in communication on environmental issues. A study by Hart and Feldman (2014) analysed coverage on climate change on the evening news broadcast of the ABC, CBS and NBC between January 2005 and June 2011, and found that 59.3% mentioned the threatening component of climate change impact and 59.1% discussed a recommendation about possible action that could be taken. But the threatening impact and recommendation were rarely discussed in the same broadcast and the recommendation mostly discussed response efficacy (29.8% included a positive statement and 15.7% a negative statement). Statements about positive self-efficacy occurred only in 6.4% of the broadcasts (no statements on negative self-efficacy, collective efficacy was not measured).

The Dual Pathway Model of Coping with Collective Disadvantage

However, according to the Dual Pathway Model of Coping with Collective Disadvantage (DPM; Van Zomeren et al., 2010), a fear appeal without efficacy is not necessarily a problem when trying to increase intentions to act on the collective problem of climate change. The DPM predicts there are two distinct psychological coping mechanisms that precede collective action: emotion-focused and problem-focused coping, that can operate simultaneously and independent of each other, as depicted in Figure 1. Van Zomeren et al. (2010) state that fear of the negative consequences of climate change is seen as the emotion-focused approach coping and the perceived group's efficacy is seen as the problem-focused approach coping. Evidence that supports the Dual Pathway Model has been found in both experimental and field studies in the context of collective disadvantage (e.g. Thomas, 2005; Van Zomeren et al., 2008).

Figure 1

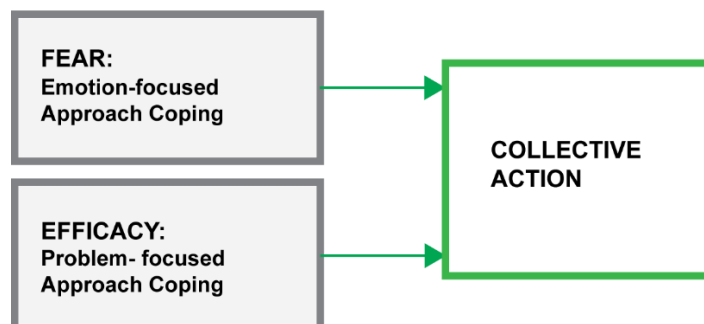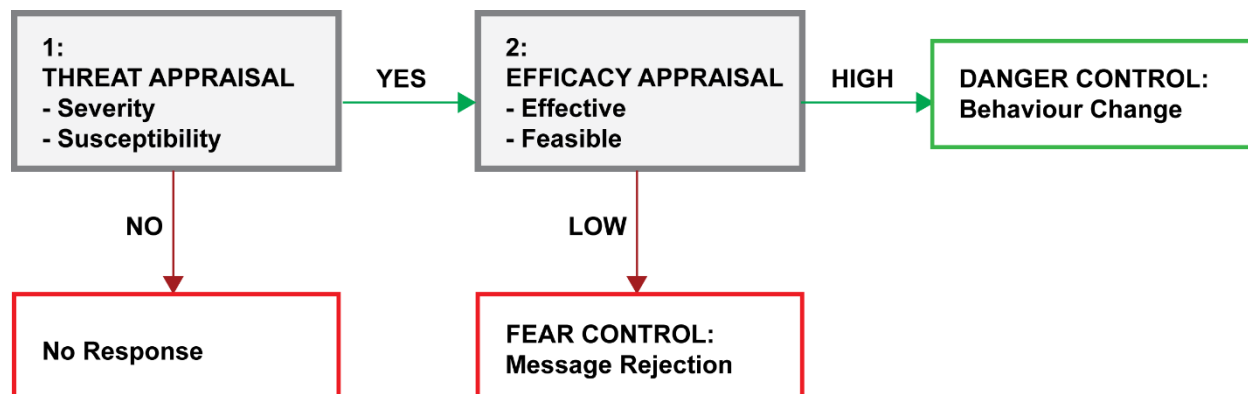*Dual Pathway Model of Coping with Collective Disadvantage*

Figure 2

The Extended Parallel Process Model

The Extended Parallel Process Model

However, the most recent fear appeal theory used in health psychology, the Extended Parallel Process Model (EPPM; Witte, 1992), contradicts these independent effects of fear and efficacy. According to the EPPM, the inclusion of an efficacy component is prerequisite for the fear appeal to obtain the desired result. The EPPM states that the evaluation of a fear appeal will initiate two appraisals, which can lead to three different outcomes (no response, message acceptance and message rejection), as shown in Figure 2.

First, the threat from the message will be appraised. If someone feels they are susceptible to the threat and the threat is considered severe enough, they will be motivated to initiate the second appraisal, otherwise it will lead to the outcome of no response. Secondly, the recommendation from the message will be appraised. If the recommended action is seen to be effective in controlling the risks (response efficacy) and feasible to perform (self-efficacy) the message will be accepted and one will initiate danger control. This is the positive and intended outcome of the fear appeal, as it will motivate the individual to take protective action and change their behaviour. However, if the recommended action is not seen to be effective or feasible, it will result in ongoing fear arousal, and since the danger cannot be averted the fear appeal will then evoke defensive motivation. The individual will attempt to control their fear by rejection of the message, through denial (It won't happen to me), defensive avoidance (It's too scary to think about) or reactance (They are trying to manipulate me, so I will ignore them) (Witte & Allen, 2000; Peters et al., 2013).

To summarise, the EPPM states that without an efficacy component, using fear in

communication won't have the desired effect. Even worse; the well- intended call-to-action might backfire and people might go into defensive mode, deny the situation and refuse to take any more action (Fritsche et al., 2012; Hornsey et al., 2015; Witte & Allen, 2000). This means the lack of efficacy in environmental communication (Hart & Feldman, 2014) could have some serious negative unintended effects.

Unlike the use of fear appeals in the health domain, the effectiveness of fear appeals in the domain of environmental communication has not been extensively studied. Apart from the study of Van Zomeren et al. (2010), there have been a handful studies so far (Jugert et al., 2016; O'Neill & Nicholson-Cole, 2009; Perrault & Clark, 2017). A survey among college students conducted by Perrault and Clark (2017) showed threat and efficacy to be significant predictors of sustainable intentions, they emphasize the need for an efficacy component but also stress importance of other variables, such as subjective norms and incentives. Jugert et al. (2016) conducted four experiments in Germany and Australia and the study showed that the manipulation of collective efficacy has the potential to increase pro-environmental intentions, by increasing perceived capability of the group and the self. In a study of O'Neill and Nicholson-Cole (2009), it was demonstrated that fear appeals have the potential to attract people's attention, but they also found that fear appeals were generally ineffective in motivating genuine personal engagement.

Given that there is only a limited amount of studies in this field so far, it is important that more research is conducted on the effectivity of fear appeals in encouraging pro-environmental behaviour, especially since fear is often used in climate change communication and frequently without an efficacy component, which could have negative effects.

Purpose of the present study

The present study tested the effectiveness of fear appeals in the environmental domain and examine the effect of fear and collective efficacy on sustainable intentions. Detecting a change in actual behaviour would be the most interesting outcome to study but because of limited time and resources, a longitudinal study was not possible. Measuring the effect of a fear appeal over a longer period of time is also difficult, because people are frequently confronted with communication concerning the environment. Therefore the outcome variable that was measured, was the intention to act sustainable, as it is considered a direct predictor of sustainable behaviour (Bamberg & Möser, 2007; Klöckner, 2013).

The main research question of the present study was: 'Does a two-component fear appeal, (with a fear and a collective efficacy component) encourage sustainable intentions?', where it was hypothesized that it would *(H1: A two-component fear appeal, with a fear and a collective efficacy component, increases more sustainable intentions than a neutral text.)* Furthermore, this study looked at the main effects of the fear condition and the collective efficacy condition and how this differs from combining the two, where it was hypothesized that a combination of fear and collective efficacy would have a larger effect than just fear or just collective efficacy *(H2: A two-component fear appeal has a larger effect on sustainable intentions than an fear appeal with only an fear component & H3: A two-component fear appeal has a larger effect on sustainable intentions than an fear appeal with only an collective efficacy component).* Since there is a lot of environmental communication that solely depends on the fear aspect, exploratory analysis was conducted to test if a fear-only appeal has a positive effect on sustainable intentions compared to a neutral text. The possible interaction effect between the fear and collective efficacy condition was also tested, as well of the possible effect of the fear and/ or collective efficacy condition on self-efficacy.

Method

Participants and design

Two hundred forty-four participants (159 women, 83 men, 2 other) were part of the study, after discounting questionnaires that were invalid. The participants were between 18 and 82 years old (mean age 32.13 years, $SD = 13.51$). Most participants had a higher vocational education (30%) or a university degree (48%), were living in the Randstad (66%) and answered that they were of Dutch cultural background (86%). The participants were recruited through several social media platforms and the network of the researcher. A gift card worth €25,- was given away among the respondents that completed the whole survey and a code worth credit for the websites SurveyCircle or SurveySwap was given out. The participants were randomly assigned to one of four conditions as visualized in Table 1. The 2x2 design manipulated fear information (yes/no) and collective efficacy information (yes/no). The control condition had 58 participants, the fear-only condition had 60, the collective efficacy-only condition had 61 and the two-component condition had 65.

Procedure

The survey was executed online, using the Qualtrics Survey Platform, and respondents

Table 1

Experimental Design

	Collective Efficacy: No	Collective Efficacy: Yes
Fear: No	**Control Condition** - Neutral Text	**Collective Efficacy-Only** - Neutral Text - Collective Efficacy
Fear: Yes	**Fear-Only** - Neutral Text - Threatening Consequences	**Two-Component** - Neutral Text - Threatening Consequences - Collective Efficacy

could participate on a laptop or smartphone. Prior to starting the survey, respondents were informed about their anonymity and privacy and asked for their consent. To make sure respondents were not primed before starting and that the survey would not only attract people already interested in the topic of sustainability, they were told that the study was about their thoughts and feelings concerning their surroundings. In the next step the respondents were randomly assigned to one of the four conditions. They were asked to carefully read the text provided in that condition. Afterwards, the participants were first asked some demographic questions, and after that they were asked several questions in a randomized order, about fear, collective efficacy, self-efficacy and sustainable intentions. At the end of the survey there was a short debriefing, explaining the subject of the research and a recommendation towards a few helpful websites, concerning climate change and the coronavirus.

Materials and Measures

In all conditions the participants read the following neutral text: *"The amount of CO^2 in the atmosphere has increased enormously in recent decades. The main reason for this, is the burning of fossil fuels. These are used for electricity generation, heating, transport and industry. The increase in CO^2 has caused the average temperature worldwide to rise by more than 1 degree, compared to 150 years ago. This increasing global warming increases the risk of flooding, rainfall and more heat waves, among other things. The average temperature in the Netherlands has risen 1.7 degrees and in 2019, for the first time, a temperature of more than 40 degrees was measured"*. In the control condition this was all the text participants had to read. In the fear-only condition another paragraph was added about threatening consequences: *"Heat*

waves and extreme temperatures can have a very dramatic impact on health, especially for babies and the elderly, from overheating, strokes, organ failure to potentially death. The scorching heat is hitting everyday life severely, as work effectiveness drops drastically and some activities and events need to be aborted. Nature is threatened, a small spark can cause a rapidly spreading dangerous forest fire, especially in extreme drought. Biodiversity will also change; the plants and animals that normally occur in the Netherlands, may be displaced by more exotic species that now feel at home here, due to the hotter temperatures, which causes new problems". Below the text, a forest fire was depicted. Participants assigned to the collective efficacy-only condition read a different paragraph: a recommendation aimed at collective efficacy: *"Many experts agree that the climate crisis is not an unsolvable problem. Individuals can contribute to a positive change by taking collective action. Everyone can do something and added up this makes a substantial difference. Two examples: 1. On average, a household in the Netherlands uses about 24 incandescent or halogen lamps. If these are replaced by an LED lamp, this saves approximately 112.5 kg of CO^2. This is something we can easily do. Added up for a street, this means a saving of 3.4 tons, for a large city 3.4000 tons and for the entire country the possibility to save 0.9 Mton CO^2. 2. Keeping computer data in the cloud is increasingly becoming the norm, but continuously active data servers require a lot of electricity and more and more must be built to keep up. There are easy ways for everyone to reduce your amount of unused data on the cloud; for example, unsubscribe from newsletters that you do not read, change the setting on Whatsapp so that photos are not automatically downloaded and delete large unused files on dropbox or Google Drive. If we clean up 100GB in the cloud, we reduce 0.2 tons of CO^2 emissions and can thus save 0.1 Mton CO^2 annually in the Netherlands"*. Below the text was a picture visualizing the amount of a ton of CO^2. In the two-component fear appeal condition, the respondents read the neutral text, the threatening consequences text and the recommendation about collective efficacy and saw both pictures. The information in the texts was gathered through various websites.

Fear was measured with two items, $\alpha = 0.90$,: *"I am fearful/afraid of the negative future consequences of the climate crisis".* Collective efficacy was measured by three items, $\alpha = 0.78$: *"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?”). Self-efficacy was measured by five items, $\alpha = 0.89$: *“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”.* Sustainable intentions were measured with five items, $\alpha = 0.76$: *“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”/ “I plan to take more small energy-saving measures, for example installing radiator foil, taking shorter showers or replacing old light bulbs with LED/” To me it is more important to arrive quickly at the desired holiday destination than to travel environmentally friendly”.* The last item was recoded in the analysis, as it was negatively formulated. The questions were items of the validated questionnaire of Van Zomeren et al. (2010), that was translated to Dutch by a proficient translator, except for the last two items of sustainable intentions, which were added to include a broader scope. The fourth item was added by the researcher and the fifth item was taken from the questionnaire used by Jugert et al. (2016). All variables were measured on a 7-point Likert scale (1 = not at all, 7 = very much) and presented in a randomized order.

Analysis

The data was analysed using IBM Statistical Program for Social Sciences 26 (SPSS). First, the data was cleaned up. Participants that did not complete the study, or were under the age of 18 years, were removed and the data was checked for outliers. Two cases were removed after it showed they were outliers on the boxplot of multiple dependent variables. After calculating the reliability, means were computed for the constructs. To test for equal distribution across conditions, an ANOVA with age as a dependent variable and condition as independent variable was executed. For gender, education level, city of residence and cultural background, chi-square tests were performed to test for equal distribution across conditions. Before performing the analysis, assumptions regarding homoscedasticity and linearity were checked. Because of a large sample size, normality was assumed. A manipulation check on the fear condition was executed by performing an ANOVA with the fear and collective efficacy conditions as independent

variable and fear as dependent variable. The collective efficacy condition was added as an independent variable to test for a possible unwanted effect on fear. A manipulation check on the collective efficacy condition was executed by performing an ANOVA with the collective efficacy and fear condition as independent variable and collective efficacy as dependent variable. The fear condition was added as an independent variable to test for an possible unwanted effect on collective efficacy. To test the three hypotheses, an ANOVA was executed with the fear and collective efficacy condition as independent variables and sustainable intentions as the dependent variable. To test for a possible interaction effect, the interaction between the fear and collective efficacy condition was included in the same ANOVA. To test a possible effect of the fear and/or collective efficacy condition on self-efficacy, an ANOVA was executed with the fear and collective efficacy condition as the independent variables and self-efficacy as the dependent variable.

<div align="center">

Results

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Randomisation

To test if age was distributed equally across the four conditions, an ANOVA with age as a dependent variable and condition as independent variable was executed. The resulting F value was non-significant ($p = .86$). A chi-square test of independence was conducted to ensure a random distribution of gender (where the gender 'other' was excluded, since it would distort too much), which showed a significant result of $\chi^2 (3) = 8.50$; $p = .04$. This indicated a significant uneven ratio of woman/men across four conditions, as depicted in Table 2. Another chi-square test was conducted on education level, city of residence and cultural background and showed non-significant values of $p > .42$

Table 2

Gender Distribution over Different Conditions

Gender	Neutral	Fear	C.E.	Two-component
Female	42	35	46	36
Male	16	24	14	29
Total	58	59	60	65

Table 3

Means, Standard Deviations and Correlations for Dependent Variables

Variable	*M*	*SD*	Fear	C.E.	S.I.	S.E.
1. Fear	2.98	1.45	—			
2. Collective Efficacy	2.92	1.23	.28**	—		
3. Sustainable Intentions	3.04	0.93	.55**	.45**	—	
4. Self-Efficacy	2.85	1.11	.48**	.38**	.55**	—

Note. $N = 244$, **$p < .01$.

Correlations

Table 3 summarizes the means, standard deviations for and correlations between the dependent variables. There is a significant small positive correlation between fear and collective efficacy ($r = .28$, $p = .00$; $N = 244$), a significant medium positive correlation between fear and sustainable intentions ($r = .55$, $p = .00$; $N = 244$), a significant small positive correlation between fear and self-efficacy ($r = .48$, $p = .00$; $N = 244$), a significant small positive correlation between collective efficacy and sustainable intentions ($r = .45$, $p = .00$; $N = 244$) and a significant medium positive correlation between sustainable intentions and self-efficacy ($r = .55$, $p = .00$; $N = 244$).

Manipulation Checks

Two manipulation checks were performed, for the fear manipulation an ANOVA was executed, with the fear and collective efficacy condition as independent variables and fear as dependent variable. It showed no significant effect of the fear condition, $F(1, 241) = 0.01$; $p = .93$, or the collective condition, $F(1, 241) = 0.03$; $p = .87$, on the dependent variable fear. Respondents did not experience significantly more fear in any of the conditions. For the collective efficacy manipulation, an ANOVA was executed with the collective efficacy and fear condition as independent variables and collective efficacy as dependent variable. It showed no significant effect of the collective efficacy condition, $F(1, 241) = 0.03$; $p = .87$, or fear condition, $F(1, 241) = 0.61$; $p = .44$ on the dependent variable collective efficacy. Respondents did not experience significantly more collective efficacy in any of the conditions. Both manipulations were unsuccessful in obtaining the desired effects.

Main Effects and Exploratory Tests

    To test if the fear and/or collective efficacy condition have an effect on sustainable intentions and to test a possible interaction of the fear and collective efficacy condition, an ANOVA was executed with the fear and collective efficacy condition and their interaction as independent variables and sustainable intentions as dependent variable. There were no significant results found for the main effects; for the effect of the fear condition $F(1,240) = 1.35$; $p = .25$, partial $\eta^2 = .01$, the effect of the collective efficacy condition $F(1,240) = 0.60$; $p = .44$, partial $\eta^2 = .00$. Table 4 displays the means and standard errors per condition. Because no significant results were found, all hypotheses were unsupported. The interaction of the fear and collective efficacy condition showed no significant results, $F(1,240) = 0.20$; $p = .66.$, partial $\eta^2 = .00$.

    To test for a possible effect of the fear and/or collective efficacy condition on self-efficacy, an ANOVA was executed with the fear and collective efficacy condition as independent variables and self-efficacy as dependent variable. No significant results were found for the fear condition, $F(1, 241) = 1.59$; $p = .21$, partial $\eta^2 = .01$, or collective efficacy condition, $F(1, 241) = 1.40$; $p = .24$, partial $\eta^2 = .01$. To investigate what the possible effect of the uneven distribution of gender is on the dependent variables, an independent T Test was executed with gender (only male/female) and fear, collective efficacy, sustainable intentions and self-efficacy as dependent variables. This showed a significant effect of gender on fear; $t(240) = -3.25$, $p < 0.01.$; where males showed an higher average of fear ($M = 3.40$, SD $= 1.68$) than females ($M = 2,77$ $SD = 1.28$) The results of the effect of gender on collective efficacy, sustainable intentions and self-efficacy showed no significant differences.

Table 4

Means and Standard Deviations of Sustainable Intentions per Condition

	M	SD
1. Neutral	2.95	.83
2. Fear	3.03	.99
3. Collective Efficacy	2.98	1.00
4. Fear and Collective Efficacy	3.18	.89

Discussion

The present study aimed to investigate if fear appeals have a positive effect on sustainable intentions and if the combination of fear and collective efficacy is more effective than using just one of these components. The fear appeal in the experiment was constructed by using a threatening component and a collective efficacy component. Research shows collective efficacy is more effective than self-efficacy when addressing a global and complex problem like climate change, because this environmental problem goes beyond the individual-level and takes group effort to solve (Chen, 2015; Homburg & Stolberg, 2006, Van Zomeren et al., 2010). Hypothesized was that a two-component fear appeal, with fear and collective efficacy, would have a larger effect on sustainable intentions than a neutral text and that a two-component fear appeal would have more effect than the use of fear or collective efficacy alone. The non-significant results of the analyses showed no support for any of the hypotheses. Exploratory analyses were done to test for a possible interaction effect of the fear and collective efficacy condition, and for a possible effect of the fear and efficacy condition on self-efficacy. These analyses showed no significant results. The manipulation checks of the fear and collective efficacy condition on fear and/or collective efficacy showed no significant results. The randomisation check showed an uneven distribution of gender across the conditions.

Theoretical and Practical Implications

There are several possibilities for the manipulations not obtaining the desired results. First of all, according to the Extended Parallel Process Model (Witte, 1992), the first appraisal in a fear appeal is the appraisal of the threat in terms of susceptibility and severity. The threat should be assessed as severe enough and one should feel they are susceptible to this threat. It could be possible that since people are currently experiencing another threat, the coronavirus, they experience the threat of climate change as less severe. Research conducted in the city of Rotterdam, showed that in the first weeks of April, forty per cent of the inhabitants felt personally threatened by the outbreak of the coronavirus and a third worried about losing their job (Engbersen, 2020). Linville and Fischer (1991) state that there is a 'finite pool of worry', where the increased concern for one risk might decrease the concern for other risks, so people only have a certain capacity to worry. Within the environmental domain this could mean that threatening messages about dramatic climatic phenomena (like melting ice caps) might worry people and decrease their concern for more local threats that could be more easily be acted upon

by the individual (O'Neill & Nicholson-Cole, 2009). If you look across domains, the continuing threat of the coronavirus might limit the capacity to worry about climate change issues. This suggest that the 2020 corona crises might not be a potential accelerator in the required system change in order to halt climate change. It could also implicate that when using a fear appeal to encourage sustainable behaviour, it is wise to take the level of fear of the current societal situation into account and perhaps refrain from using more fear, while the coronavirus is causing anxiety already.

  Secondly, the perceived severity and susceptibility of the climate change message could also be influenced by the long period that the alarm bells on global warming have been sounding. People may block out yet another climate change message, as our filters have become very selective in an information-overloaded world (Moser & Dilling, 2007). In health psychology, research concerning smoking cessation showed that individuals will become desensitized by continued exposure to fear appeals; in particular those most at risk. The (heavy) smokers become accustomed to ignoring the warnings on cigarette packs, especially if these messages try to induce awareness of the mortality of the target group (Hastings et al., 2004; Peters et al., 2013). Considering all of us are at risk, concerning global warming, this might implicate that prolonged exposure of a threatening climate change message will lose or has lost its effect and different framing is needed. Hastings et al. (2004) state that a 'law of diminishing returns' might exist when relying on fear appeals for a longer period, where there is a constant need to intensify the threat to produce the same level of fear, but at a certain point this level of fear will become unethical. Moser and Dilling (2007) state that the task of climate change communication is to have news value, but suggest using surprising or odd elements to gain the attention of the listener. In all conditions of the present study, respondents were presented with a neutral text that discussed the effects of global warming. Although considered neutral, it might still have been enough to trigger an avoidance strategy for a majority of the participants, and potentially account for the manipulations to fail in obtaining their desired effects.

  Thirdly, a possible explanation for the absence of an effect of the collective efficacy manipulation is, that using CO^2 to describe the benefits of collective action might have been too abstract. A picture visualizing CO^2 was added, to try to make the concept more tangible, but might not have succeeded. Abstraction is a problem that can hinder climate communication: people often fail to respond to hazards that they can't see, hear, feel or touch, due to evolutionary

mechanisms (Griskevicius et al., 2012). That's why the naturally odourless gas (some of us still use for cooking and heating) has been scented, so people can smell if something is wrong. Perhaps people would be more responsive if harmful emissions would also been scented or intentionally coloured, to show us the danger in the air (Griskevicius et al., 2012). Because this is not the case, examples concerning the advantages of environmental action could focus less on abstract terms as CO^2 and more at palpable concepts, like reducing drought and heat or preserving animal species (Hart & Feldman, 2014). Another possibility is to focus on advantages other than environmental effects like economic benefits, such as development of green jobs or personal savings on the energy bill. This could engage a wider public, which usually might not be so concerned with environmental issues and this way a more diverse social movement could be catalysed (Nisbet, 2009).

Most likely the fact that the manipulations did not have a significant effect, explains the non-significant results of the main effects of fear and collective efficacy on sustainable intentions and of the explorative tests. It is therefore not possible to discuss possible implications concerning the need to include an collective efficacy component next to a threatening component. The two models discussed in the introduction, the DPM and EPPM, theorize different mechanisms, where the DPM suggests independent pathways for fear and collective efficacy and the EPPM suggest efficacy as a requirement for the effect of fear. To compare both theories and test them when using a fear appeal in environmental domain might be an interesting direction for future studies, as there is a lot of climate change communication based solely on fear.

Limitations and Future Directions

There are a few limitations of this study to mention. The distribution of males and females was not evenly spread across in the four conditions, the conditions with fear had more males. On average the males showed somewhat higher scores on the outcome of fear. This could potentially mean that the fear manipulation only worked on the males, however to exclude males or females from the sample would mean losing the required power for testing.

Another weakness may lie in the fact that a lot of respondents have been recruited on survey-sharing websites. On these platforms, students that are writing research papers can earn credit by filling in surveys and use their credit to gather their own respondents. This gave the opportunity to obtain a large sample size and therefore good power to run analyses. The

drawback of this is that because the students want to gather respondents as quickly as possible, it is possible that they might not read the texts with attention or answered the questions as carefully as was needed. Possible solutions to counteract this might have been to set an amount of time per page after which respondents can continue and including a control question to check if respondents are paying attention.

Lastly, a limitation that is unfortunately too well known in (psychological) research is the overrepresentation of higher educated, western, women. In this study, no conclusions could be made due to non-significant results but otherwise it could have meant that generalizability would have been limited. There has been an increasingly louder call for research to include a more diverse sample that is not WEIRD (Western, Educated, Industrialized, Rich & Democratic). That this has been and is the usual subset could be due to a lack of easy access to a more diverse sample and the preference to look into internal validity at the expense of external generalizability (Henrich et al., 2010; Keith, 2019). During recruitment of the participants of this study, extra efforts have been to increase the level of non-Dutch cultural background or lower-educated participants to counteract this tendency. The final sample still included a high level of WEIRD respondents, which shows how difficult this task is and therefore perhaps as well how necessary it is for fellow researchers to dedicate more effort towards it in future research. Especially considering climate change is a global problem which needs behaviour change on a global scale.

The present study tried to connect different psychology domains by using knowledge of the extensively studied fear appeal in health psychology and comparing it to the less studied environmental situation. In the near future more attention for the connection between those two domains might be needed, because the ongoing human pressure on the environment will have direct and indirect consequences on health. In health psychology focussing more on collective behaviour might become important, as this indirectly influences health risks associating with climate change (Bernard, 2019). Connecting theories and research of the health and environmental psychology domain is therefore considered an important direction for future research.

Conclusion

To conclude, this study examined the effectiveness of fear appeals when used for climate change communication. The aim of this study was to contribute to the expansion of knowledge and application of the fear appeal in the environmental domain, which is a useful effort because

at this moment there are but a handful of studies published on this topic ánd communicating concerning climate change is often framed by emphasizing threat. It was theorized that the 2020 corona crisis could potentially function as a catalyst in the societal transition needed for climate crisis, because the crises made the potential of collective effort visible. Furthermore, it was theorized that when constructing a fear appeal to encourage sustainable intentions, it is more important to emphasize collective efficacy instead of self-efficacy, which is often used in individual-based fear appeals that try to encourage health behaviour. The lack of significant results in this study might be due to several reasons. It could be that using a fear appeal to encourage sustainable intentions might not induce the fear needed to have an effect, because people are already experiencing fear from another threat, the coronavirus, because of a limited capacity to worry. It might also be of importance to frame the message of climate change differently, because the prolonged threatening message of global warming might have lost its strength and the abstraction in explaining the benefits of reduced CO^2 might not connect with the audience. Although no final conclusions could be drawn from this research, there are certainly leads for future research of fear appeals in the field of climate change communication, as well as for the connection between health and environmental psychology, where insights from one domain could benefit another.

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