Cowabunga Cowtastrophe: An empirical research on the influence of fear appeal and collective efficacy on consumption intentions and preferences towards

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ABSTRACT

This paper investigated if fear levels in persuasive environmental messages affect one's preference towards meat and level of intentions to reduce weekly meat consumption, and whether perceived collective efficacy moderates this effect. An online experiment was conducted among 182 meat-eating participants with either a low or high perceived collective efficacy. A 3 (level of fear appeal: no vs. low vs. high) x 2 (level of collective efficacy: low vs. high) between-subjects design was used. Results showed that high levels of fear do not necessarily translate to higher levels of preference towards meat and intentions to reduce weekly consumption of meat.

Keywords
Persuasive environmental message, fear appeal, meat-consumption, climate change, preference towards meat

INTRODUCTION
Climate change has been a contentious issue in recent years, with many scientists urging people to start adopting more sustainable habits (National Aeronautics and Space Administration, 2019). Due to the increased salience in the topic, many people and businesses have started adopting more sustainable habits (The Nielsen Company, 2015). While these efforts have been commendable and effective, there is still a significant need to be more proactive in more sustainable practices. One of the most impactful moves to combat climate change is to adopt a vegan or vegetarian diet. Oxford University's Joseph Poore argues that adopting a vegan diet is the single most effective way to reduce one's impact on the Earth (Carrington, 2018). Marco Springmann, of Oxford University, also claimed that the elimination of red meat from diets everywhere would decrease food-related emissions by approximately 60% (Nuwer, 2016). If the world adopted a vegan lifestyle, emissions would decline to around 70%. Several activist organisations such as People for the Ethical Treatment of Animals (PETA) try to encourage people to adopt a vegetarian or vegan lifestyle by using fear appeals to shock their target audience. Grotesque looking images of animals being slaughtered can be seen in some of their campaigns

and despite the backlash from the public on how graphic some of their campaigns are (Khara, 2019), it has been credited for the 600% rise in the number of vegans in the US (Oberst, 2018). Despite the rise in the vegetarian and vegan lifestyles and the use of fear appeals to promote such a lifestyle, there has been limited research done on the effectiveness of persuasive messages on persuading people to consume less meat (Low, 2019). Therefore, this research will add value to the scientific community and society, as it explores the impact of fear appeals in persuasive messages on the consumption of meat, with perceived collective efficacy moderating such effects. Hence, the research question is: To what extent do fear appeals in environmental persuasive messages influence people's preference towards meat and their intention to reduce their weekly consumption of meat, and is this relationship influenced by the level of perceived collective efficacy?

THEORECTICAL FRAMEWORK

Fear Appeal
Fear appeal can be defined as "persuasive communication that attempts to arouse fear in order to promote precautionary motivation and self-protective action" (Rogers & Deckner, 1975, p. 222-223). A meta-analysis conducted by Witte and Allen (2000) showed that the stronger the fear aroused by a fear appeal, the more persuasive a message is. Therefore, hypothesis 1 is formulated.
H1: A high level of fear appeal in an environmental persuasive message influences (a) one's preference towards meat consumption, and (b) intentions to reduce the weekly consumption of meat more than a low or no level of fear appeal.

Perceived Collective Efficacy
The Collective Efficacy Theory by Bandura (1982) explains that perceived collective efficacy can influence people's actions individually and as a group, how much effort they put into these actions, and whether they will continue to remain in the group despite the group producing disappointing results. Therefore, hypothesis 2 is formed.
H2: People with a higher perception of collective efficacy will be more likely to (a) have lesser preference towards meat and (b) have increased intentions to reduce their weekly consumption of meat than people with lower

perception of collective efficacy.

Extended Parallel Process Model (EPPM)
The EPPM, developed by Witte (1992), states the degree to which a person feels threatened determines his or her motivation to act, with one's efficacy being the moderator of the effect. Therefore, hypothesis 3 is developed.
H3: Higher levels of fear appeal in an environmental message will (a) influence people's preference towards meat consumption and (b) increase their intention to reduce their weekly consumption of meat among people with higher collective efficacy than people with lower collective efficacy.

METHOD

Design
The research design of this study is a 3 (level of fear appeal: no vs. low vs. high) x 2 (level of collective efficacy: low vs. high) between-subjects design. The independent variable, fear appeal, has three levels: no, low, and high, which were manipulated. The moderator, level of perceived collective efficacy, has two levels: low and high, which were measured. Accordingly, this study in total has three different treatment groups, but six experimental groups.

Participants
Participants were recruited using the convenience and snowball sampling methods. This helped ensure that a large number of respondents could be collected in a short amount of time. Links to the questionnaire were published on Facebook, Instagram, and via personal texts to friends, family members, and followers. In addition, posters with a QR code linking people to the questionnaire were placed around the school campus. For this questionnaire, vegetarian and vegan participants were excluded. Overall, 183 participants completed the survey-embedded experiment, but 1 participant indicated that he/she is not a meat-eater and therefore, excluded from the analysis.

Procedure
Using Qualtrics, a questionnaire was created in order to gather data from participants. A consent form explaining the details of the experiment was presented at the start of the questionnaire, which all participants agreed to before continuing with the experiment. The questionnaire consisted of five parts. The first part included questions about the demographics of the participants, the second part asked questions to determine the level of perceived collective efficacy of the participants, the third part included the stimuli which the participant had to look at for a minute before proceeding, the fourth part aimed to measure the participants' level of preference towards meat, the fifth part wanted to find out the participants' intentions of consuming less meat, and the last part measured the actual environmental knowledge of participants. A restricted random assignment with 60 people in each condition was used in Qualtrics to randomly assign participants to one of the three treatment conditions.

Independent Variables
The independent variable 'level of fear appeal' was manipulated by exposing the participants to an article with varying levels of fear. The 'no fear' condition had a picture of a healthy polar bear and an article describing the general effects of global warming and how meat consumption can help reduce these effects. The 'low fear' condition had a picture of a skinnier polar bear and the same article as the 'no fear' condition, but with an additional two sentences in the middle explaining the effects of climate change on South Africa. Lastly, the 'high fear' condition had a picture of a starving polar bear and the same article as the 'no fear' condition, but with an additional two sentences in the middle explaining how the effects of climate change can directly affect the reader. Both the 'low' and 'high' fear conditions had 289 words each, while the 'no' fear condition had 252 words.

Before deciding on which articles to use, a pretest was conducted with approximately 10 participants in order to understand which of the following articles were perceived to be more fearful. The results of the pretest affirmed that the stimuli materials worked well and that the participants' perception of fear in each level were in line with the expectations of our conditions.

The moderator variable 'level of perceived collective efficacy' was determined using the scale formulated by Sampson (1997), which has been cited over 10,000 times. This scale has been used in multiple contexts previously, such as to investigate if the level of perceived collective efficacy was effective in encouraging people to meet the recommended dietary guidelines for fruit and vegetable intake (Halbert, et al., 2013) and supporting policies to mitigate climate change (Wang, 2017). Therefore, this scale is deemed suitable enough.

Dependent Variables
The dependent variable 'preference towards meat' is measured using a four-item scale adapted by King and Meiselman (2010). The dependent variable 'intentions to reduce weekly consumption of meat' is measured using a four-item scale by Loy, Wieber, Gollwitzer, and Oettingen (2016)

Covariates
A bivariate analysis was conducted to check for confounding variables. A Pearson correlation analysis revealed a relationship between sex and how it affects one's preference towards meat, $r = -.36$, $p > .001$, between sex and how it affects one's level of intention of weekly meat consumption, $r = -.35$, $p > .001$, between education level and how it affects one's preference towards meat, $r = -.16$, $p = .034$, between the level of hunger and how it affects one's preference towards meat, $r = .20$, $p = .008$, between the level of environmental knowledge and how it affects one's level of intentions to reduce weekly meat consumption, $r = .28$, $p > .001$. Therefore, the variables 'sex', 'education level', 'level of hunger' and 'level of actual environmental knowledge' were considered confounding variables and were added to the analysis in

order to control for their effects.

RESULTS

Randomisation Check
A chi-square test was conducted to examine if sex and education levels were equal across all the three fear conditions, with the sex association being insignificant, $\chi^2(3,183) = 2.23$, $p = .527$, and the education levels also being insignificant, $\chi^2(6,183) = 3.53$, $p = .740$. In addition, a one-way ANOVA was conducted to examine if age, perceived environmental knowledge, actual environmental knowledge, and hunger were equal across all the fear conditions. Based on the Levene's Test of Homogeneity of Variances, none were significant as well. This shows that all the covariates had a relatively equal spread of the variables in the three conditions.

Manipulation Check
A one-way ANOVA was conducted to examine if the respective fear conditions were perceived by the participants as expected. The analysis of variance showed an insignificant weak effect of fear conditions on perceived levels of fear, $F(2,179) = 0.50$, $p = .606$, $\eta^2 = .01$. The test result revealed that participants in the no fear condition felt the least fearful of the message, while participants in the low fear condition felt the most fearful of the environmental message.

Hypothesis 1
In order to examine the main effects of the variables 'level of fear appeal' and 'level of perceived collective efficacy' on the dependent variables 'preference towards meat' and 'intention to reduce weekly meat consumption', as well as the interaction effect between the two independent variables, a MANCOVA was conducted. Group sizes across conditions did not differ by more than 10%. Therefore, equal variances could be assumed. The tests of between-subject effects showed no significant main effect of 'level of fear appeal in an environmental message' on 'preference towards meat', $F(2,182) = 0.48$, $p = .621$, $\eta^2 = .00$. Based on the result, a linear relationship can be observed, although insignificant. This means that the higher the level of fear appeal in the message, the higher the intentions of reducing weekly meat consumption. Thus, H1a and H1b are rejected.

Hypothesis 2
The tests of between-subject effects showed no significant main effect of 'level of perceived collective efficacy' on 'preference towards meat', $F(1,182) = 2.02$, $p = .158$, $\eta^2 = .00$. It also revealed that there was no significant main effect of 'level of perceived collective efficacy' on 'intention to reduce weekly consumption of meat', $F(1,182) = 0.52$, $p = .473$, $\eta^2 = .00$. Thus, H2a and H2b are also rejected.

Hypothesis 3
The MANCOVA analysis shows a statistically insignificant interaction effect of fear condition and level of perceived collective efficacy on preference towards meat, $F(2,182) = 0.68$, $p = .507$, $\eta^2 = .00$. There is also a statistically insignificant interaction effect of fear condition and level of perceived collective efficacy on intentions to reduce weekly consumption of meat, $F(2,182) = 0.26$, $p = .774$, $\eta^2 = .00$. We may conclude that the effect of perceived collective efficacy on preference towards meat and intentions to reduce weekly consumption of meat is not different for the varying fear conditions. Therefore, hypothesis 3a and 3b are rejected.

DISCUSSION

Findings
This study investigated the effectiveness of fear appeals in environmental messages among people with either low or high perceived collective efficacy and how it influences their preference towards meat and intentions to reduce weekly consumption of meat. Three hypotheses were tested, with all of them being unsupported.

Based on the results in the manipulation check, although insignificant, it has been observed that the no fear condition was perceived to be the least fearful, while the low fear condition was perceived to be the most fearful. This could have been the case because the high fear condition could have been too fearful for the participants and therefore, they reject the message. This result is in line with Janis' fear-as-acquired drive model (Witte, 1992), which proposed an inverted U-shaped relationship between fear and message acceptance. He proposed that fear was needed in order to evoke a motivational drive but too much fear will result in maladaptive responses which could cause people to be more defensive towards the message.

The results of the study can be explained by the EPPM model by Witte (1992). The higher levels of preference towards meat and intentions to reduce weekly consumption of meat can be observed in the high fear condition for the group with a higher level of perceived collective efficacy could be because danger control has been activated. Therefore, it can also be said that the people with a lower level of collective perceived efficacy also could have experienced fear control, which may explain their results.

Limitations
Although careful steps have been taken to ensure the validity and reliability of the study, it inevitably comes with some limitations. Firstly, the stimuli for the three conditions were self-made and not based on an existing study. Secondly, the study included participants who were mostly between 19 to 23 years old and are probably also studying. There were also almost twice the amount of females than males in the study, which could have attributed to the skewing of results. Therefore, this makes the results of the study not generalisable to the rest of the population. Lastly, the participants of the pretest did not have a similar demographic as the participants of the main study. The difference in participant demographics could have explained why the conditions worked well in the

pretest but not in the main study when conducting the manipulation check.

CONCLUSION

To conclude, fear appeals in environmental persuasive messages do not significantly influence people's preference towards meat and their intentions to reduce their weekly consumption of meat. This relationship is also not influenced by the level of perceived collective efficacy. Although the findings were insignificant, it is worth noting that people with a higher level of perceived collective efficacy tend to evoke a higher level of preference towards meat and intentions to reduce weekly consumption of meat when presented with a more fearful message than people with a lower level of perceived collective efficacy. Therefore, it is recommended for environmental groups to take into consideration the target audience when developing a persuasive message involving fear appeals and adjust the level of fear, where necessary.

ROLE OF THE STUDENT

Angela Low is an undergraduate Communication Science student working under the supervision of Corine Meppelink when the research in this report was performed. The topic was proposed by the student. The design of the questionnaire, processing of the results, formulation of the conclusions, and the writing were completed by the student.

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