Environmental Protection: Testing the Validity of the Extended Parallel Processing Model (EPPM) when a Threat and Proposed Solution Require Collective Action

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Abstract:

The Extended Parallel Process Model (EPPM) posits that a fear-inducing message will be effective if it presents a serious and relevant threat. To generate favorable reactions, a strong threat combined with a high-efficacy recommendation is advised. By contrast, a strong threat with a low-efficacy recommendation will trigger counterproductive reactions. This research tests these predictions using concepts of collective threat and collective efficacy adapted to fight climate change. The results were partially consistent with the EPPM. As expected, a message with a strong collective threat and a high-efficacy collective recommendation was the most persuasive. Also, a message presenting a strong collective threat and a low-efficacy collective recommendation generated more negative reactions than the one with a strong threat and high-efficacy recommendation. However, contrary to our expectations, a message presenting a weak threat did not elicit the weakest reactions.

Keywords: EPPM, Environment Social Marketing, Fear Advertising.

Track: Advertising & marketing communication

1. Introduction

"Climate change is the greatest challenge facing humanity today" (Kofi Annan, 2015). This alert from the former UN Secretary General was supported by the alarming conclusions of the 5th report of the Intergovernmental Panel on Climate Change (IPCC) that extreme weather events will intensify with global warming and coastal megacities will be threatened by rising sea levels (Radio Canada, 2013). Much of the effort to reduce greenhouse gas emissions (considered the greatest contributor to global warming) will need to be carried out by governments, industries, and businesses. But citizens can also contribute to saving the planet by taking action every day to save energy. It is this type of ecoresponsible behavior that social advertising (McKenzie, Mohr, et al., 2012), a form of advertising aimed at encouraging the adoption of prosocial behavior, seeks to promote: "Public service announcements (PSAs) are designed to inform or induce certain behaviors in specific audiences, generally for non-commercial profit using mass media-approaches" (Bator & Cialdini, 2000: 527). To promote new behaviors, a message can be based on a number of strategies, including the use of fear. This strategy exploits the uncomfortable potential of fear to encourage a target audience to adopt, maintain or change behaviors. Witte, Meyer and Martell propose the following definition of a fear appeal: "a persuasive message that arouses fear by outlining the negative consequences that occur if a certain action is not taken" (2001: 2).

A succession of theories on fear appeals beginning in the early 1950s has evolved into the Extended Parallel Process Model (EPPM) (Figure 1). According to this model, which serves largely as a guide for the design of public health campaigns, the most persuasive message based on fear is one that presents a strong threat (how severe is the threat + how susceptible am I to the threat) and a high-efficacy recommendation (how efficient is the recommendation + how able am I to follow the recommendation). However, there are two major challenges in applying this approach to environmental messages. Firstly, environmental problems generally present an impersonal threat. For example, while climate change is indeed a threat to the individual, the threat will be stronger for those living in certain at-risk areas and for future generations. The immediate impacts of climate change may not be felt by a part of the world's population. This can reduce perceived threat severity in this population (Scharks, 2016), and thereby impact the essential implication of all parties in a collective effort to battle climate change. When a message aims to address a public health problem, the individual's adoption of the promoted behavior is generally sufficient to stop the threat. However, in the case of an environmental problem, in order for the promoted behavior to have a significant

impact, it must be adopted by as many people as possible. In the present study, we integrate concepts of collective threat and collective efficacy to test EPPM hypotheses. Our objective is to determine whether the predictions of the EPPM will be confirmed or invalidated when a population faces a collective threat requiring collective action.

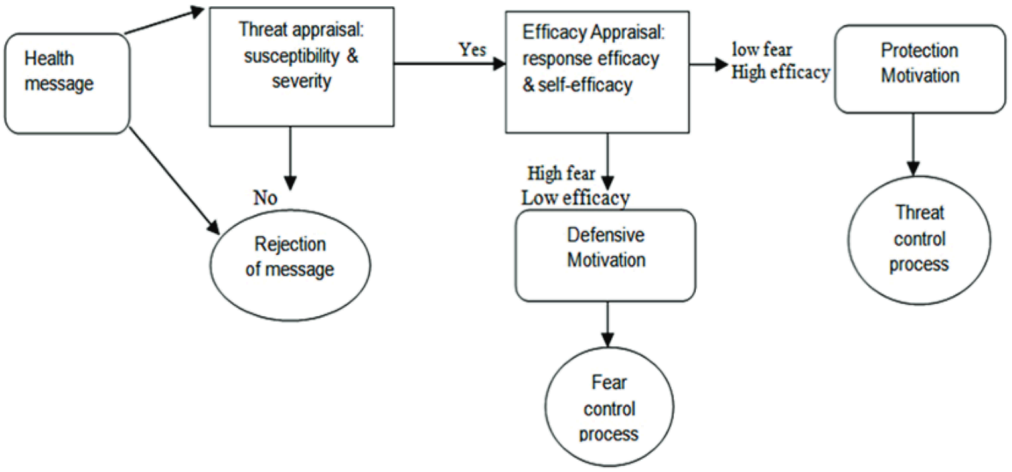

Figure 1: The Extended Parallel Process Model (Witte et al., 2001)

2. Hypothesis

The hypotheses tested in this study are based on those of the EPPM. However, notions of threat and efficacy are expressed as collective rather than individual.

Hypothesis 1a: The group exposed to a low-threat message (**LT**) will have weaker threat-control reactions (attitude and intention) than the high-threat and high-efficacy group (**HTHE**).

Hypothesis 1b: The group exposed to a low-threat message (**LT**) will have lower fear-control reactions (defensive avoidance and reactance) than the high-threat/low-efficacy group (**HTLE**).

Hypothesis 2: The group exposed to a message with high threat and low efficacy (**HTLE**) will have higher threat-control reactions than the other groups (higher scores for reactance and defensive avoidance).

Hypothesis 3: The group exposed to a message with high threat and high efficacy (**HTHE**) will have more favorable danger-control reactions than the other groups (higher scores for attitude and intention).

3. Material

The three messages used in the present study were created by modifying a Greenpeace poster. The original poster presents an image of an hourglass in which an iceberg in the upper

bulb appears to be melting, drop by drop, to flood a house in the lower bulb. This image is accompanied by the slogan: “Help us fight the melting of the ice.” This image appealed to us for two reasons. Firstly, the hourglass image illustrates some of the consequences of global warming, in particular the connection between melting ice and flooding. Secondly, it recommends energy-saving actions, a behavior advocated in our study. To adapt the poster to our study, we created three different versions of the poster (Figure 2).

Message 1
Low threat/High efficacy
(**LT**)

Message 2
High threat/Low efficacy
(**HTLE**)

Message 3
High threat/High efficacy
(**HTHE**)

Figure 2: The three posters used in this experiment

The first version presents a low threat. It should be recalled here that the two components of a threat are perceived severity and perceived vulnerability. To mitigate the threat, we played with the aspect of vulnerability. As we knew our audience would predominantly be Canadian, we played with geographical distance. Thus, in the first version of our poster, we replaced the more familiar image of a house with an image of flooded huts in Bangladesh. This image was accompanied by the message: “With global warming, the

number of devastating floods on the planet could increase." An efficacy message was also included.

The second version combines a high threat with a low-efficacy recommendation. To reinforce the threat, we emphasized two components of the threat: high severity (devastating floods) and high collective vulnerability (impact within Quebec). Thus, in the second poster we use an image of flooded houses in Quebec, accompanied by the message: "With global warming, the number of devastating floods in Quebec could increase." To minimize the perceived efficacy of the recommendation, the efficacy message was limited to an imperative: "Turn off your devices instead of putting them on standby", and no explanation about how this behavior could help to fight global warming (efficacy of the solution) was provided, nor were any tips provided to facilitate the adoption of such behavior (personal efficacy).

The third version combines a high threat with a high-efficacy recommendation (the most effective pair, according to Witte et al.). To illustrate a high threat, we used the same strategy as in our second version: an image of flooding in Quebec. To reinforce perceived efficacy, we added a short text to the recommendation that explains how the prescribed behavior is both effective and relatively easy to adopt. Table 1 presents the different statements used to express each level of the manipulation.

Table 1: Statements used on posters for each EPPM variable (with translation)

EPPM Variable	Statement
Threat severity	*Le changement climatique peut engendrer des inondations dévastatrices.* (Climate change can lead to devastating floods.)
Threat susceptibility	*Le Québec peut être affecté par ces inondations dévastatrices.* (Quebec could be affected by these devastating floods.)
Response efficacy	*Des gestes simples comme le fait d'éteindre son ordinateur au lieu de le mettre en veille peuvent aider à économiser l'énergie et à lutter contre le réchauffement. D'après Hydro-Québec, les appareils mis en veille au Canada consomment l'équivalent en électricité de 300 000 ménages.* (Simple actions such as turning off your computer instead of putting it on standby can help save energy and fight global warming. In Canada, devices on standby consume as much electricity as 300,000 households, according to Hydro Quebec.)
Self-efficacy	*Prendre tous l'habitude d'éteindre les ordinateurs non utilisés pendant plus d'une heure, est un geste simple qui profite à la fois à votre appareil, à votre facture et au climat ! Éteignez vos appareils au lieu de les mettre en veille !* (Getting in the habit of turning off computers that will not be in use for over an hour is a simple action that benefits your device, your bill and the climate! Turn off your electronic devices instead of putting them on standby!)

4. Methodology

4.1 Measured variables

Seven (7) variables were measured using a 5-level Likert scale (1 = strongly disagree, 5 = strongly agree), while the attitude variable required the use of semantic items. The internal consistency was measured using Cronbach's alpha and considered adequate. Table 2 presents these results, as well as an example of the item used for each measured variable.

Table 2: Variables measured with Cronbach's alphas

Variables	Number of items	α
Threat variables:		
Severity ("Climate change is a serious threat")	3	.769
Susceptibility ("Some negative effects of climate change will affect Quebec")	3	.896
Efficacy variables:		
Response efficacy ("The effects of climate change can be reduced by saving energy by turning off your computer instead of putting it on standby")	3	.832
Self-efficacy ("Turning off my computer when I don't use it for a while (an hour or more) is a simple thing for me to do")	3	.759
Fear control process variables:		
Reactance ("The message deliberately tries to take advantage of my feelings")	3	.843
Defensive avoidance ("When I saw the message, I had the reaction to ignore the information presented in it")	3	.828
Threat control process variables:		
Attitude ("Turning off my computer to save energy is...")	7	.922
Intention ("From now on, I will turn off my computer instead of putting it on standby")	3	.932

4.2 Procedure and participants

One hundred and forty-three participants were recruited in their classrooms. Each of them received an envelope containing a consent form, a questionnaire and one of the three versions of the poster. Variables were measured only once, after exposure to a single version of the message. The experiment lasted about 20 minutes. Data collection was carried out for just under one month. The final sample is described in Table 3.

5. Results

5.1 Fear control process (see Figure 1)

The results obtained by the three groups of respondents on the reactance and defensive avoidance variables offered support for hypothesis 1a, as well as hypothesis 2.

In order to confirm hypothesis 1a, the low-threat group (LT) had to obtain a significantly lower score on the avoidance and reactance variables than the high-threat/low-efficacy group (HTLE). Anova analysis revealed that there were no significant differences

between the three groups for defensive avoidance (F= 0.914, p= 0.403). Thus, no group was more likely than another to reject the message in order to protect itself from its more or less threatening content.

Table 3: Sample characteristics

Demographic characteristics		Number	Percent
Age	15 – 19	30	21
	20 – 24	91	63.6
	25 – 29	19	13.3
	30 – 34	2	1.4
	35 and over	1	0.7
Sex	Male	61	42.7
	Female	82	57.3
Origin	Province of Quebec	134	93.7
	Other	9	6.3
Field of study			
Information & communication		129	90.2
Other		14	9.8
Owns a laptop computer			
	Yes	136	95.1
	No	7	4.9

The experiment showed a significant difference in reactance between the three groups (F= 7.308, p = 0.001). The post-hoc test showed that participants in the high-threat group (HT) had a significantly higher mean score than those in the high-threat/low-efficacy group (HTLE) (p = 0.013). This result also invalidates hypothesis 1b for reactance because, contrary to expectations, participants in the low-threat group (LT) were more likely than those in the high-threat/high-efficacy (HTHE) group to feel manipulated by the message.

To support hypothesis 2, the high-threat/low-efficacy group (HTLE) would need to obtain the highest score for both defensive avoidance and reactance. However, the results clearly show that the group exposed to the high-threat/low-efficacy message (HTLE) was no more likely than the other groups to adopt the fear control process, whether in the form of reactance or defensive avoidance. Therefore, hypothesis 2 is not supported by our results.

5.2 Threat control process

Attitude and intention variables were used to test hypothesis 1b and hypothesis 3. In the first case, Anova results showed significant differences between the three groups for both attitude (F= 147.723, p = 0.001) and intention (F= 60.686, p = 0.001). The post-hoc test revealed that the attitude score was not significantly lower for the low-threat group (LT) than for the high-threat/high-efficacy group (HTHE) (p = 0.167). Thus, the low-threat group attitude score did not confirm the model's prediction. As for the behavior intention variable,

the low-threat group (LT) had a significantly lower mean than the high-threat/high-efficacy group (HTHE) ($p = 0.000$). This result was consistent with the model's predictions, confirming hypothesis 1b, but only for the variable of behavior intention.

6. Discussion and conclusion

Our results did not confirm the EPPM's first hypothesis, which anticipates that a strong threat will induce positive attitude and behavior intention, a strong threat being the prerequisite to processing the information presented in the message, whatever the level of perceived efficacy. We found that the group exposed to a low threat (LT) presented the same attitude score as the group exposed to a high threat (HTHE), while the latter group obtained a significantly higher behavior intention score than the low-threat group. Thus, if the combination of high threat and high efficacy generates the best results, a high perceived efficacy may lead to favorable reactions when the threat is low. Considering that it may be difficult to illustrate a strong climate threat in an ad because individuals tend to feel that this problem does not concern them, advertisers should include a high-efficacy recommendation to increase the efficacy of their message. Finally, our research supports the fundamental principle of the EPPM: combination of a strong collective threat and strong collective efficacy leads to the most favorable attitudes and behavior intentions.

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