

The role of fear and threat in communicating risk scenarios and the need for actions: Effect of fear on information processing

A.L. Meijnders^a, C.J.H. Midden^a, H.A.M. Wilke^b

^a Eindhoven University of Technology, Faculty of Philosophy and Social Sciences, Department of Psychology and Linguistics, P.O. Box 513, 5600 MB Eindhoven, The Netherlands

^b Leiden University, Faculty of Social Sciences, Department of Social and Organizational Psychology, P.O. Box 9555, 2300 RB Leiden, The Netherlands

Abstract

This paper is about the role of fear and threat in communicating risk scenarios and the need for actions. The results of our first experiment are discussed, in which we examined whether fear of environmental risks increases the tendency to carefully process information on environmentally sound behaviour.

1. INTRODUCTION

For many people large scale environmental risks such as global warming are hardly more than an abstract topic. The process of global warming is invisible, complex and distant. In addition daily newspapers inform us continuously about the many uncertainties concerning the nature, magnitude and time-scale of negative consequences.

The policy approach to this situation of uncertainty has been the introduction of the precautionary principle, which holds that policy actions have to be undertaken in spite of existing uncertainties. Although this may be a wise strategy of risk management, it unavoidably raises questions about the justification of controversial measures with strong impacts on society. Non-justified policy measures are likely to be rejected, especially when large groups are affected.

From that perspective it is crucial for environmental policy, that the possible threats of global warming can be presented in such a way, that citizens as consumers or entrepreneurs become convinced of the need for actions. Two elements are important in achieving this goal. Firstly it is a task of science to reduce uncertainty by diagnostic research. Secondly it is essential that risk scenarios are communicated in an effective way which overcomes the tendency to downgrade these risks because of their lack of perceived significance.

Recent research findings indicate that the impact of information campaigns (e.g. the Dutch campaign on climate change) is limited. Information often is insufficiently elaborated and therefore attitudinal changes do not come about, let alone behavioural changes [1]. Thinking in terms of the dual-process theories of persuasion, this may be due to a lack of

motivation to process such information [2-3]. Attempts to overcome these motivational difficulties have resulted in a higher emphasis on emotional factors in communicative programmes. However, little is known about the effects of emotion oriented communications, and how these effects come about. The purpose of the present research project is to increase our understanding of the role of emotional factors in communicating risk scenarios and the need for actions. Our special interest is in fear appeals, because there is a rich and promising theoretical and empirical literature on the effects of fear appeals in the field of health education (see [4], for an overview of the theoretical literature; for an example of an empirical study, see [5]).

A first step in increasing the effectiveness of environmental information, is to stimulate people to elaborate this information. In our first experiment we therefore examined whether fear of environmental risks increases the tendency to elaborate information on environmentally sound behaviour.

2. METHOD

2.1. Design

To examine whether fear of environmental risks increases the tendency to elaborate information on environmentally sound behaviour, the following variables were manipulated in a 2 x 2 between-subjects factorial design: Fear level (low or high) and argument quality (weak or strong). The manipulation of argument quality is assumed to be an effective way of locating differences in message processing [2]. The idea is that only when a persuasive message is carefully processed, the arguments presented in the message will have an impact on attitudes towards the message topic. This implies, that the effect of argument quality on attitudes can be considered an indication of the degree to which a message is elaborated. Other widely employed indicators of message processing are: The number of issue-relevant cognitive responses generated during message exposure and the number of message arguments recalled afterwards. The underlying idea is, that the more a message on a certain issue is elaborated, the more issue-relevant thoughts will be generated during message exposure, and the more arguments presented in the message will be recalled.

2.2. Procedure

Subjects were 76 inhabitants of Eindhoven, the Netherlands, who were assigned randomly to the experimental conditions. Subjects received all experimental instructions, manipulations and measures by means of computers.

The experimental procedure was as follows. First, subjects were exposed to either a slightly or a highly frightening message on the greenhouse effect. Next, they received either a weak or a strong persuasive message arguing for the use of a new type of energy saving light bulbs. After having read these messages, subjects completed a questionnaire. The most important measures in this questionnaire were manipulation check measures, and measures of the dependent variables, i.e. cognitive responses, attitudes towards using the new light bulb, and recall of arguments. After having completed the questionnaire, subjects were debriefed and then dismissed.

2.3. Stimulus materials

The message on the greenhouse effect presented the manipulation of fear level. The slightly frightening version of the message described the process of global warming and its

possible negative consequences, whereas in the highly frightening version in addition five black and white photographs of the possible negative consequences of global warming (e.g. floods) were shown. These photographs were impoverished by means of a computer to such a degree, that risk imagination was tickled without providing extra information.

The persuasive message on energy saving bulbs presented the manipulation of argument quality. This message consisted of a description of a new (fictitious) type of energy saving light bulbs and four arguments in favour of purchasing and using this new type of bulbs. In the weak version of the message four weak arguments were presented, whereas in the strong version of the message four strong arguments were presented. These arguments were selected from a large pool of arguments that were pretested in a pilot study on 8 subjects.

3. RESULTS

3.1. Manipulation checks

To check on the success of the manipulation of fear level, subjects were asked to rate on four 7-point scales (anchored at 1 = not at all and 7 = extremely) the extent to which they thought the message on global warming they were previously exposed to, was frightening. Ratings on these four items, which were correlated with one another (correlations ranged from 0.47 to 0.67), were averaged to create a composite measure of frightfulness ($\text{Alpha} = 0.85$). Next, the composite measure was analysed in a 2 (low versus high fear) $\times$ 2 (weak versus strong arguments) between-subjects ANOVA. This analysis yielded a significant effect of fear level, $F(1, 72) = 7.06$, $p < 0.01$. Subjects in the high fear condition rated the message on the greenhouse effect as significantly more frightening ($M = 5.56$) than subjects in the low fear condition ($M = 4.80$).

To check on the success of the manipulation of argument quality, subjects were asked to rate the strength of each of the arguments presented to them on a 7-point scale (anchored at 1 = not at all and 7 = extremely). Judgments of the four arguments were averaged to create a composite measure of argument quality. Next, the composite measure was analysed in a 2 (low versus high fear) $\times$ 2 (weak versus strong arguments) between-subjects ANOVA. This analysis yielded a significant effect of argument quality, $F(1, 74) = 24.18$, $p < 0.0001$. The strong arguments received significantly higher ratings of strength ($M = 5.58$) than the weak arguments ($M = 4.25$).

3.2. Effects on attitudes

To assess subjects' attitudes towards using the new energy saving bulb, they were asked to rate on four 7-point scales (ranging from 1 = not at all to 7 = extremely) the extent to which they thought the bulb was suitable for usage in their own households. Ratings on these four items, which were correlated with one another (correlations ranged from 0.52 to 0.79), were averaged to create a composite measure of attitude ($\text{Alpha} = 0.89$).

The composite measure of attitude was then analysed in a 2 (low versus high fear) $\times$ 2 (weak versus strong arguments) between-subjects ANOVA. This analysis yielded a significant interaction-effect of fear level and argument quality, $F(2, 75) = 4.48$, $p < 0.038$. Figure 1 shows that argument quality had no effect in the high fear condition, but in the low fear condition strong arguments had more effect on attitudes than weak arguments.

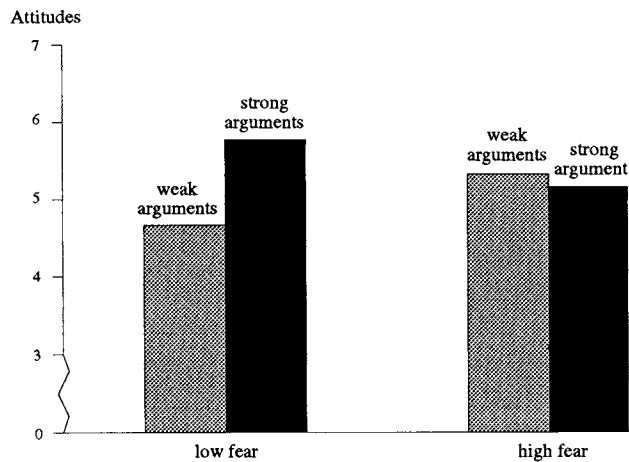


Figure 1: attitudes towards the new energy saving bulb as a function of fear level and argument quality

3.3. Effects on cognitive responses

To assess subjects' cognitive responses to the persuasive message, they were requested to complete a thought-listing task. Subjects were asked to write down all the thoughts that came to mind while reading the persuasive message on the energy saving bulb. For this purpose, subjects were provided with a form containing numbered boxes, and they were instructed to write down only one thought per box.

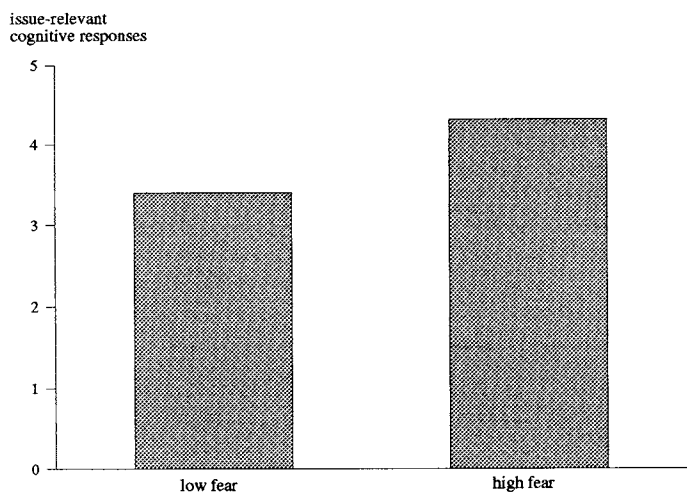


Figure 2: issue-relevant cognitive responses, as a function of fear level

The thoughts listed by the subjects were categorized by two independent judges, who rated the relevance of the responses. Agreement between the judges was 97 %. Mean scores

for the two judges were analysed. As can be seen in Figure 2, subjects in the high fear condition generated significantly more issue-relevant cognitive responses, $M = 4.32$, than subjects in the low fear condition, $M = 3.40$, $F(1,75) = 4.03$, $p < 0.049$.

3.4. Effects on argument recall

To assess subjects' recall of the arguments that were presented in the persuasive message, they were requested to write down everything they remembered about the persuasive message on a blank sheet of paper.

Two independent judges rated the number of correctly remembered arguments. Agreement between the judges was 90 %. Mean scores for the two judges were analysed in a 2 (low versus high fear) $\times$ 2 (weak versus strong arguments) between-subjects ANOVA. No significant main effect of fear level was found, $F < 1$, n.s..

4. DISCUSSION

Does fear of environmental risks increase the tendency to process information on environmentally sound behaviour? The results of the present study indicate, that this question cannot be answered with a simple yes or no. On the one hand it was found that significantly more issue-relevant cognitive responses were reported in the high fear condition, than in the low fear condition. On the other hand it was found that argument quality affected attitudes in the low fear condition, but had no effect on attitudes in the high fear condition.

The extensive literature on the effects of fear on information processing may help us to interpret these findings. Recently, the results of two studies on the effects of fear on information processing were published, which showed that fear may interfere with systematic processing of irrelevant information, i.e. information which is unrelated to the threat [6-7]. For example, in one of the experiments reported by Baron and colleagues, it appeared that fear of a dental treatment interfered with systematic processing of information on sales taxes. In another study, Baron and colleagues found that fear of a dental treatment facilitated systematic processing of information on fluoridated water, which suggests that fear may stimulate systematic processing of relevant information, i.e. information that is related to the threat. In the present study we also found indications that *low* levels of fear may facilitate systematic processing of relevant information, for we found that when fear of the greenhouse effect was low, information on energy saving bulbs was systematically processed. On the other hand however, we found that when fear of the greenhouse effect was high, information on energy saving bulbs was not elaborated. This latter finding suggests that *high* levels of fear may interfere with systematic information processing.

According to the protection motivation theory of Rogers, fear motivates people to seek protection from the threat they are exposed to [9-10]. This protection seeking process most likely involves mental activity. High levels of fear presumably induce stronger motivation to seek protection, and hence more mental activity, than low levels of fear. This might explain why in our experiment subjects in the high fear condition generated significantly more cognitive responses, than subjects in the low fear condition. At the same time it explains why subjects in the high fear condition made no distinction between weak and strong arguments, whereas subjects in the low fear condition did differentiate between weak and strong arguments. Subjects in the high fear condition invested so much mental capacity in dealing with the threat, leaving insufficient capacity for elaboration of the message on energy saving bulbs. In other words, our hypothesis is, that fear may have a positive effect on motivation

to elaborate relevant information, but at high levels of fear, this positive effect may be overruled by a negative effect on information processing capacity.

An alternative explanation of the results presented in this paper is, that the pictures presented to the subjects in the high fear condition made great demands on their information processing capacity, not because they aroused fear, but because cognitive capacity was needed to interpret them.

Although it is too early to formulate clear recommendations on how to deal with emotions in persuasive communications, the literature as well as the results of our experiment suggest, that the role of fear in the persuasion process is far from simple. In several communicative programmes emotional appeals have been applied to convince people to take account of the environmental consequences of their behaviour. However, the outcomes of our research project so far indicate, that emotional appeals should be applied only under carefully specified conditions. In the remaining two years of the project we hope to learn more about the role of fear and threat in communicating risk scenarios and the need for policy measures and behavioural changes.

5. REFERENCES

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