

Fear Appeals, Individual Differences, and Environmental Concern

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ABSTRACT: In this study, the authors examined the effect of a brief but intense antipollution message on verbal commitment (stated willingness to act) and on three forms of immediate behavioral commitment (donating money, donating time, and signing a petition). Exposure to the antipollution message produced significantly more verbal commitment and financial donations but not more time donations than did exposure to a control message. Nearly every participant signed the petition. To determine whether environmental fear appeals should be targeted at specific audiences, the authors computed correlations between seven individual difference variables and environmental concern. None of the individual difference variables were significantly related to financial or time donations. However, political orientation was significantly correlated with verbal commitment.

Millions of dollars are spent annually on a wide variety of public education campaigns to change knowledge, attitudes, and behavior with respect to environmental issues. The effectiveness of these campaigns has been rarely evaluated experimentally. With the world in the midst of an ecological crisis, we believe more research should be conducted to help educators understand how these campaigns may facilitate the resolution of environmental problems.

In this study, we examine two general hypotheses:

1. Environmental concern increases immediately following exposure to a brief but intense antipollution message

2. The effectiveness of appeals on behalf of the environment is influenced by a variety of viewer characteristics and beliefs

The study also had a more practical purpose: to produce tangible responses (signed petitions, volunteered time, and financial donations) on behalf of antipollution efforts.

Fear Appeals

The persuasive effects of frightening messages have been studied for more than 35 years (for an early example of this work, see Janis and Feshbach 1953). Fear appeals have been used to try to change attitudes and behaviors related to a wide variety of hazards, including smoking (e.g., Maddux and Rogers 1983), breast cancer (e.g., Siero, Kok, and Pruyn 1984), drug and alcohol abuse (e.g., Fritzen and Mazer 1975; Sherer and Rogers 1984), and sexually transmitted diseases (e.g., Rogers and Mewborn 1976). Despite some inconsistencies in the literature, fear appeals, in general, have been found to be effective agents of attitude change (Rogers 1983).

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Perhaps not surprisingly, almost all previous fear appeals research has focused on threats to personal health. In this study, we address the question of whether fear appeals are also effective when the threat is not directed to the person but rather to some aspect of the physical environment. This distinction between threats to the self and threats to the environment appears to be a necessary one. Schmidt and Gifford (1989) report that environmental hazards (e.g., pollution) are consistently perceived as more threatening to the environment than to the self. Because individuals distinguish between the two, research that examines responses to both is required.

A second characteristic of fear appeals that may influence their effectiveness is the length of delay between message exposure and the attitude and behavior measure. Results from a recent study by McClenney and Neiss (1989, study 2) suggest that delays of as little as 1 to 3 weeks may decrease message effectiveness to almost zero.

Although this result may raise questions about the practical effectiveness of fear appeals, it does so mainly when the measure delay is a matter of days or weeks. There are many situations in which fear appeals are immediately followed by requests for action. For example, television commercials and telethons often include a toll-free number that individuals can call, right after a request for response, to make purchases or donations.

Goals of the Study

Our first goal in this study was to investigate short-term responses to fear appeals concerning the environment in situations that call for an immediate viewer response. A second goal was to investigate how individual differences might influence viewer responses to an antipollution appeal. Seven individual difference variables were included in this study: political orientation, political extremism, optimism about future levels of water pollution, involvement in past activism, gender, and perceived threats to oneself and to the environment from environmental hazards.

Dependent Measures

Many previous studies on fear appeals have focused on changes in attitudes and intentions (Burnett 1981; Sherer and Rogers 1984). Our primary dependent variables were three behavioral measures of environmental concern (donating time and money to a proenvironment group and petition signing). For comparison, a measure of self-reported intentions (verbal commitment) was also included.

Method

Subjects and Site

The participants were 104 student volunteers (46 males and 58 females) from the psychology department

subject pool of a medium-sized university. Their mean age was 23.6 years, and they had completed, on average, 18 course units (equivalent to just over 1 year of full-time study). Participation was voluntary. Students were not required by the psychology department to take part in research projects and were not paid to participate.

The university is located in a city close to the Pacific Ocean where there is no central sewage treatment facility. Instead, sewage is transported in pipes a few hundred meters offshore and, after passing through a mesh screen at the end of the pipe, is discharged into the water. High fecal coliform counts have caused authorities to close several local beaches, and activists have expressed concern for the safety of marine life in the area.

Procedure and Materials

Potential volunteers were telephoned and asked if they wished to participate in a study of environmental attitudes. One to eight subjects participated in each session. Each group was randomly assigned to either the experimental (antipollution message) or control condition.

A brief questionnaire was developed to assess the participants' political ideology, optimism about future levels of ocean pollution, past activism, and demographic characteristics. Questions included the following:

1. My present political orientation is best described as far right, moderate right, central, moderate left, far left, or other (please describe).
2. Looking ahead 25 or 30 years, do you feel that our water will be much more polluted, somewhat more polluted, about the same, somewhat less polluted, or much less polluted?
3. Have you engaged in any past activism? If so, please describe your involvement.

After completing this questionnaire, participants were administered the Environmental Hazard Assessment Inventory (Schmidt and Gifford 1989), which we used to assess the perceived threats posed by environmental hazards to the person and to the environment.

Next, participants were exposed to one of two media presentations. Those in the experimental condition read a 318-word antipollution editorial dealing with global ocean pollution issues, a regional environmental crisis associated with a recent oil spill, and the local waste disposal system, which dumps millions of tons of untreated domestic sewage into the ocean each year. The editorial was factual and was written in a concrete, expressive style to maximize its impact. Descriptions of environmental problems associated with water pollution from various locations around the world were included to emphasize the magnitude and severity of the problem.

Participants in the experimental group were then shown a set of 14 slides that vividly depicted the effects

of ocean pollution on beaches and marine life. The slides included images of police officers collecting medical refuse at a beach, a seal tangled in a discarded fishing net, and poisoned fish washing up on shore.

Participants in the control condition read an editorial, of approximately the same length as the ocean pollution article, that criticized post-modernist architecture and were then shown 14 slides of modernist and post-modernist urban architecture.

Following the message presentation, all participants responded to another questionnaire, which included distractor items related to the editorial and the slides. The questionnaire also included items to assess verbal commitments to 10 antisewage dumping activities, such as telephoning city hall to register a complaint regarding current dumping practices, spending 10 minutes reading a newspaper or magazine article related to sewage disposal, and engaging in illegal activities with the explicit goal of undermining current dumping practices. A complete list of these verbal commitment items appears in Table 1. The participants were asked to check each activity that they "would be willing" to engage in.

After completing the verbal commitment questionnaire, participants were taken, one at a time, to a separate room where a representative of a local environmental organization concerned with sewage disposal was stationed. The representative briefly explained the organization's goals and asked each participant if he or she were willing to make any or all of the following behavioral commitments:

1. Sign a petition to be sent to a government official responsible for the environment, demanding legisla-

tion forbidding the dumping of raw sewage into coastal waters

2. Make a written commitment to spend 4 hours typing, stuffing envelopes, or delivering flyers for the organization
3. Donate money (amount chosen by the participant) to the activist organization

During the solicitation period, the representative emphasized that the commitments were voluntary but real; that is, the petition would actually be sent to a government representative, those who volunteered time would actually be called to fulfill their written commitment, and financial donations would actually be given to the organization. The financial donations were collected at the time of the experiment. In cases where participants wanted to donate money but were unable to do so immediately, arrangements were made to collect the donation at a later time (in most cases, within a few days).

Finally, the subjects were escorted back to the main testing area where they were debriefed and given the opportunity to ask any question or express any concern they had about the study.

Results

Descriptive Statistics and Preliminary Analyses

In general, the participants believed that future levels of water pollution would worsen ($M = .92$, $SD = 1.02$, where 0 = much more polluted than the present and 4 = much less polluted). The mean scores for perceived threats from environmental hazards to the self and to the environment were 3.44 ($SD = .94$) and 4.19 ($SD =$

TABLE 1. Verbal Commitment Questionnaire Items

- | | |
|-----|--|
| 1. | Telephone the local government to register a complaint regarding current sewage dumping procedures |
| 2. | Spend one hour actively searching out information about sewage disposal |
| 3. | Join an antisewage dumping march on city hall. |
| 4. | Organize an antisewage dumping movement in your work place, school, or community |
| 5. | Take part in illegal activities, with the explicit goal of undermining current sewage dumping practices |
| 6. | Make a written commitment to pay 5% more taxes or rent to help cover the expense of a new sewage treatment plant |
| 7. | Write a letter to your elected officials voicing your dissatisfaction with the city's present sewage disposal policy |
| 8. | Spend ten minutes reading a newspaper, magazine, or pamphlet article related to sewage disposal in the city |
| 9. | Spend an evening at a local meeting concerning sewage disposal |
| 10. | If a financial trade-off were possible, write a statement expressing your willingness to give up a major international sporting event to be hosted by the city so that the money could be applied toward a local sewage treatment facility |

.78), respectively, where 1 = no threat and 7 = extreme threat. The latter two means were significantly different ($t [103] = 9.87, p < .001, r = .49$), replicating previous findings (Schmidt and Gifford 1989) that environmental hazards are perceived as more threatening to the environment than to the self.

Approximately 12% of the sample indicated that they had engaged in past activism. On average, the participants described their political orientation as being slightly left of center ($M = 2.38, SD = .80$, where 0 = far right and 4 = far left). Very few of the subjects (5.1%) described themselves as holding extreme political views ($M = 1.61, SD = .59$).

Verbal commitment, the attitude measure, was scored as the number of activities on the verbal commitment questionnaire that subjects indicated that they would be willing to engage in ($M = 5.86, SD = 1.83$, maximum = 10). As noted earlier, three behavioral measures were included in the study: financial donation (the amount of money donated to the environmental organization, $M = \$1.99$ (Canadian), $SD = 4.55$), time donation (the number of working hours volunteered to the environmental organization, $M = 2.67, SD = 4.23$), and petition signing (whether participants signed the petition against sewage disposal in the ocean). More than 98% (102 out of 104) of the participants signed the petition. Because of its lack of variability, this measure was dropped from further analyses.

Fear Appeals and Environmental Concern

To test our first general hypothesis, that participants exposed to the antipollution fear appeal would exhibit more environmental concern than those in the control group, we performed a multivariate analysis of variance on the three dependent variables: verbal commitment, financial donation, and time donation. The independent

variable was message exposure (experimental versus control conditions).

Using Wilks's criterion, the combined dependent variables were significantly affected by message exposure ($F[3, 94] = 6.92, p < .001$). Participants in the experimental condition displayed more environmental concern than did those in the control. Univariate F tests revealed that verbal commitment ($F[1, 96] = 8.89, p < .01, r = .29$) and financial donation ($F[1, 96] = 11.77, p < .01, r = .33$) significantly contributed to the composite dependent variable. Participants exposed to the fear appeal exhibited higher verbal commitment to activism: They endorsed, on average, 6.35 statements as opposed to 5.27 for the control group. More important, from a practical standpoint, they also donated more money to the environmental organization (\$3.07 versus 27 cents, on average).¹ Time donation was not significantly affected by message exposure ($F[1, 96] = .21, ns, r = .057$). The means and standard deviations for verbal commitment, financial donation, and time donation, broken down by condition, are presented in Table 2.

Two chi-square analyses were performed to determine whether the frequencies of financial and time donations differed between the experimental and control conditions. Subjects exposed to the antipollution message (36%) more frequently donated money than those in the control condition (9%), ($\chi^2(1) = 8.06, p < .005$). Frequency of time donation was also greater in the experimental condition; however, this difference was not significant, 59% versus 46% ($\chi^2(1) = .80, ns$).

Individual Differences

To examine the second general hypothesis, that individual differences are related to viewer response to the antipollution message, we computed 21 Pearson correlation coefficients (one for each of the seven individual

TABLE 2.—Means and Standard Deviations for Verbal Commitment, Financial Donation, and Time Donation By Experimental Condition

	Verbal commitment ^a	Financial donation (Canadian \$)	Time donation (hours)
Antipollution message ($n = 55$)			
<i>M</i>	6.35	3.07	2.43
<i>SD</i>	1.81	5.32	3.15
Control message ($n = 49$)			
<i>M</i>	5.27	0.27	2.82
<i>SD</i>	1.74	1.08	5.33

^aVerbal commitment is the number of items (out of 10) endorsed.

TABLE 3.—Pearson Correlations between Individual Difference Variables and Dependent Variables ($n = 55$)

Individual difference variables ^a	Verbal commitment	Financial donation	Time donation
Optimism	.00	.04	-.04
Gender	.18	-.04	.07
Past activism	.18	.02	.14
Political orientation	.36*	.18	.19
Political extremism	.16	.06	.03
Perceived threat to self	.18	.13	.14
Perceived threat to environment	.21	.02	.14

* $p < .01$.

^aOptimism (about future levels of water pollution) was measured on a scale from 0 (much more polluted) to 4 (much less polluted). Gender and past activism were measured on dichotomous scales (0 = male, 1 = female; and 0 = no, 1 = yes, respectively). Political orientation was measured on a scale from 0 (far right) to 4 (far left). Political extremism was measured on a scale from 1 (central) to 3 (extreme). Perceived threat was measured on a scale from 1 (no threat) to 7 (extreme threat).

difference measures and verbal commitment, financial donation, and time donation). Because directional hypotheses were not made, two-tailed significance tests were conducted. A reasonably stringent significance criterion ($p < .01$) was also adopted to control for family-wise error. None of the individual difference variables were significantly correlated with financial donation or time donation. Political orientation was significantly correlated with verbal commitment: Participants who described their political orientation as left of center tended to display stronger verbal commitments to anti-pollution activities than did those who described their political orientation as right of center ($r = .36$, $p < .01$). Given the number of correlations computed, this result may be spurious and should be interpreted with caution. A complete listing of the correlations is presented in Table 3.

Discussion

Fear Appeals and Environmental Concern

One goal of this study was to determine whether fear appeals are effective when the threat is not directly to oneself but rather to some aspect of the natural environment. In general, our results support this notion. The fear appeal on behalf of the environment significantly increased environmental concern in the form of verbal commitment and financial donations. In the case of financial donations, more than ten times as much money was donated in the experimental condition than in the control condition. Message exposure was not signifi-

cantly related to the frequency or magnitude of time donation. However, the rate of time donation was relatively high (more than 45%) for both the experimental and control groups. This suggests that environmental organizations may be able to attract time donations simply by making it easy to volunteer.

Individual Differences

A second goal of the study was to investigate how individual differences might influence viewer responses to an environmental appeal. None of the seven individual difference variables were significantly correlated with the behavioral measures of environmental concern, and only political orientation was significantly related to verbal commitment. This pattern could have occurred for a number of reasons. First, behavioral responses to environmental fear appeals simply may not be related to viewer characteristics. If so, media messages on behalf of environmental issues need not be individually tailored for specific segments of the population; this can represent a significant savings for the marketing budgets of activist organizations. Second, our sample of undergraduates may have been too homogeneous to provide the necessary variability for a true relation to be discovered. A replication of this study using a more diverse sample would provide insight into this possibility. Finally, other individual difference variables, not measured in this study (e.g., emotionality, locus of control, self-esteem, etc.), may influence viewers' responses to environmental appeals. Further research is necessary to resolve this issue.

Conclusions

The results of this study have considerable potential for application. A strong proenvironmental message closely followed by attempts to solicit financial support (e.g., television campaigns with an immediate phone-in component for making donations) should be very effective in increasing verbal or financial support for antipollution groups. Furthermore, activist groups may not need to target their campaigns to specific market segments because the effectiveness of the message does not appear to vary with viewer characteristics, at least not those examined in this study.

NOTE

1. Although the average donation for the experimental group was only \$3.07, some subjects donated considerably more (up to \$20.00 in some cases). Furthermore, given a large target population, even a small average donation will generate a substantial income for environmental groups.

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