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*Environment and Behavior* 2003 35: 752  
DOI: 10.1177/0013916503254755

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# A TWO-STEP INFORMATIONAL STRATEGY FOR REDUCING LITTERING BEHAVIOR IN A CINEMA

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**ABSTRACT:** A field experiment investigated the effects of a two-step informational strategy to reduce littering in a cinema. Step 1 consisted of ambiguous information and aimed at inducing high cognitive motivation for a central processing of the subsequent information. Step 2 resolved the ambiguity and presented the antilittering

ENVIRONMENT AND BEHAVIOR, Vol. 35 No. 6, November 2003 752-762

DOI: 10.1177/0013916503254755

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information. In the experimental condition, the two-step antilittering information was given before the movie show, whereas in the control condition, no manipulation was included. Twenty-one shows with 4,329 visitors were analyzed. The informational strategy of the experimental condition (11 shows) resulted in a significant reduction (28.3%) in the weight of litter per person as compared to the control condition (10 shows). Thus, contrary to a previous conclusion of Horsley, ambiguous signs can be effectively used to reduce littering. Considering previous research, it is argued that the fit between communication strategy, the internal norms of the recipients, and the resulting motivation of the recipients is crucial for the design of an effective anti-littering campaign.

**Keywords:** *littering; intervention; behavior change; communication; norms*

**Problems with the** pollution of roads, public transport facilities, and other public or semipublic spaces exist in many countries, cities, and communities. This is unpleasant from the viewpoint of city hygiene and because of the financial costs associated with the cleanup of these places. Pollution, in many cases, is caused by littering—the careless, incorrect disposal of minor amounts of waste. The problem of littering is old, and a considerable amount of research has been devoted to enhancing its solution (for summaries, see Cone & Hayes, 1980; Geller, Winett, & Everett, 1982; Keenan, 1996; Stokols & Altman, 1987). The research shows that there exists a close relationship between social norms and littering versus nonlittering behavior. For example, various studies have shown that littering behavior increases with the amount of litter that is already present (Finnie, 1973; Krauss, Freedman, & Whitcup, 1978; Reiter & Samuel, 1980). An explanation for this effect is that the amount of litter that is present at a place sets a norm for littering versus antilittering behavior in that setting. Cialdini, Reno, and Kallgren (1990) and Reno, Cialdini, and Kallgren (1993) analyzed the relationship between norms and littering behavior in more detail. In their analyses, they differentiated two different types of social norms: (a) *descriptive norms*, which describe what is generally done in a particular setting or place, and

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AUTHORS' NOTE: *We thank students Myriam Baumeler, Rolf Debrunner, and Patrick Waibel for their assistance in conducting the experiment. Special gratitude is also due to the CINEMAX in Zurich for their cooperation with the project. Gratitude is due for financial support provided by BUWAL (Swiss Federal Office of Environment, Forests, and Landscape), AWEL (Office of Waste, Water, Energie, and Air of Kanton Zurich), ERZ (Entsorgung & Recycling Zurich), and the City of Winterthur. We thank Daniela Urbatzka for correcting the English manuscript. Address correspondence to Dr. Ralf Hansmann, ETH Zürich, UNS, HAD, Haldenbachstrasse 44, CH 8092 Zürich; e-mail: hansmann@uns.umnw.ethz.ch.*

(b) *injunctive norms*, which specify what is socially approved of in a setting. They developed a focus theory of normative conduct (Cialdini et al., 1990), which states that the cognitive focus of a person mediates the effects of different norms on behavior and that this focus depends on the salience of the different types of norms. By applying their theory, they could correctly predict some surprising findings. In a field experiment, they could show that the observation of a person who is littering in a clean environment (where the descriptive norm was, correspondingly, not to litter) did not increase littering behavior of naive subjects but, instead, reduced littering behavior. This result appears surprising because it contradicts a psychological expectation derived from social learning theory (Bandura, 1979), which would rather predict an increase in littering behavior because of a tendency of observers to imitate the behavior of models. Reno et al. explained their result by arguing that the observation of littering behavior in a place where a descriptive norm not to litter exists makes this norm more salient and, hence, causes the observer to focus on the antilittering norm and fulfill it. Similarly, Cialdini et al. showed that if a single, eye-catching piece of litter was positioned in an otherwise clean environment (where the descriptive norm was also not to litter), this also led the observers to focus on the antilittering norm and, consequently, the littering behavior of these observers was reduced as compared to a control condition where no litter at all was present. This latter result represents an exception of the relationship described above, namely, that the more polluted a place is, the more people tend to additionally pollute the place—a relationship that, apart from this exception, has also been confirmed by the data of Cialdini et al.

Moreover, Cialdini et al. (1990) and Reno et al. (1993) showed that inducing a focus on an injunctive antilittering norm can reduce littering behavior in both a clean and a polluted place, whereas a cognitive focus on the descriptive norm can only reduce littering in a clean place (where the descriptive norm not to litter exists).

From the practical perspective of public administration and services, an effective design of antilittering campaigns—for example, comprising signs, pictures, and slogans supporting the injunctive antilittering norm—is wanted. There has already been some previous research to test the effectiveness of communication strategies, which aim to shape behavior according to the antilittering norm.

In a field experiment of Reich and Robertson (1979), which was conducted in a public swimming pool, the messages, “Help keep your pool clean” or “Keeping the pool clean depends on you,” proved to be effective in reducing littering, whereas strong demands like, “Don’t litter” and “Don’t

you dare to litter,” did not. The study of Reich and Robertson showed that normative commands and the corresponding external pressure might be counterproductive because they can cause psychological reactance (Brehm, 1966, 1972), whereas messages addressing internal normative standards—for example, by appealing for help—can be effective in reducing littering. Similar results as in the study of Reich and Robertson have been obtained by Durdan, Reeder, and Hecht (1985) in a study concerning littering in a university cafeteria and in a study by Geller, Witmer, and Orebough (1976) in a store.

These former studies focused on the interaction or fit between the communication strategy used to appeal for compliance with an external norm (i.e., the injunctive antilittering norm, in the terminology of Cialdini et al., 1990) and the internal norms and the resulting motivations of the subjects. Cialdini et al. (1990) and Reno et al. (1993) neglected to consider the aspect of communication strategy, because their studies focused on the salience of two types of external norms (injunctive vs. descriptive) as mediated by different observations (polluted vs. unpolluted environments, observing a person littering vs. observing a person picking up litter) and not as mediated by direct, intentional communication. However, in terms of the focus theory of normative conduct, the four messages presented above, which were used in the study of Reich and Robertson (1979), all addressed the injunctive antilittering norm, and, accordingly, it may well be assumed that the salience of this injunctive norm is increased by each of these four messages. Nevertheless, the latter two of these messages have not been effective in reducing littering, which appears to be inconsistent with the focus theory of normative conduct. The results of Reich and Robertson show that to simply address the injunctive norm (which can be assumed to elicit a focus on this injunctive norm) is not sufficient to guarantee the efficiency of a communication strategy.

In the case of the first two messages, there seems to exist a fit between the communication strategy (including, among other aspects, style, content, and aim of the strategy), the internal norms, and the resulting motivations of the recipients. The recipients may perceive these messages as polite, as appealing for help, as not exploiting, as serving to reach a good aim, and so forth, and the messages might, hence, fit into the internal norms for eliciting an altruistic motivation. Moreover, the specific altruistic motivation that is elicited corresponds with the aim of the strategy—namely, to achieve a reduction of littering behavior. In the case of the latter two messages, there might exist a mismatch between the communication strategy, the internal norms of the recipients, and the resulting motivations. The recipients might have norms

referring to the style, content, and the objective of a communication strategy. Because of their demanding formulation, these messages might activate the reactance motivation of the recipients, which is incompatible with the goal of the communication strategy. It, hence, appears plausible to assume that the fit between a communication strategy, the internal norms of the recipients, and the resulting motivation of the recipients is crucial for the design of an effective antilittering campaign.

In a study by Horsley (1988), an ambiguous and punitive formulation of an antilittering sign was shown to be counterproductive for reducing littering in a state park. Horsley concluded that "the wording of signs designed to reduce littering should be clear, non-punitive and unambiguous" (p. 14). With respect to clarity and nonpunitive wording, there might exist consensus to agree with this conclusion despite the fact that, in a study of Reiter and Samuel (1980), a sign threatening people with a concrete fine of \$10 for unlawful littering behavior proved to be as effective in reducing littering as a more polite formulation emphasizing cooperation—a result indicating that reactance might be overcome by heightened state pressure. However, with respect to the ambiguity of messages, the conclusion of Horsley should be restricted to single-step informational strategies. Previous studies have exclusively used single-step informational strategies where all the stimuli and information supporting antilittering behavior have been presented simultaneously to the subjects. In a two-step informational strategy, the ambiguity of a first stimulus might be functional to induce cognitive inconsistencies and, hence, motivate persons to actively search for and intensively process information (Duncker, 1935; Festinger, 1957; Kruglanski, Baldwin, & Towson, 1985), which is subsequently presented to them in the second step of the strategy. This might enhance central processing of the information, which is a key factor for not only achieving changes of attitudes and behaviors but also the persistence and durability of these changes (Petty & Caccioppo, 1986a, 1986b). Therefore, it can be assumed that a two-step informational strategy comprising Step 1, with the aim to induce cognitive motivation for central processing of the information, and Step 2, in which additional information supporting antilittering behavior is presented, can be effective in reducing littering behavior even though ambiguous information is presented in Step 1. Two additional prerequisites are that (a) the communication strategy achieves making the injunctive antilittering norm salient, and (b) there exists a fit between the strategy, the norms of the recipients, and the resulting motivations.

This hypothesis, which is of practical significance for the design of informational antilittering strategies, has been tested in the present experiment.

## METHOD

### SETTING AND SUBJECTS

The experiment was conducted in the largest of the ten halls of the Cinemax cinema complex in Zurich, Switzerland. This hall offers space for a maximum of 501 visitors. Next to it, in the entrance hall of the cinema, there are two counters where popcorn, beverages, ice cream, and so forth are sold. Numerous trashcans are available near the counters as well as in the cinema halls themselves. According to the owners of the cinema, littering is a problem that causes considerable additional costs because of cleaning up. The experiment included 21 movie shows between the 7th and 20th of June 2001. Exclusively, *Pearl Harbor* was presented. Altogether, 4,329 persons attended the shows.

### BASIC EXPERIMENTAL DESIGN AND DEPENDENT MEASURES

There were two conditions in the experiment. In the experimental condition, a sequence of two pictures (see Figures 1 & 2) representing a two-step informational strategy for reducing littering behavior was presented before the beginning of the movie. In the control condition, no experimental manipulation was included.<sup>1</sup>

At the end of each show, the litter in the cinema hall was collected, and the weight of the litter was assessed. The weight of the litter divided by the number of persons in the audience, representing the weight of litter per person, served as the dependent variable of the experiment.

There was a random assignment of the different shows to the experimental versus control condition. Eleven shows were assigned to the experimental condition and 10 shows to the control condition. In addition to the random assignment, the different days of the week and the different times of the shows were balanced between the two conditions as much as possible. The difference between the average number of visitors in the experimental condition ( $M = 181.3$ ,  $SD = 162$ ) versus the control condition ( $M = 233$ ,  $SD = 163$ ) was not significant,  $t(19) = 0.73$ ,  $p = .47$ . However, to control for its effects, the size of the audience variable was included in the statistical analysis.

### STIMULUS MATERIAL AND DESCRIPTION OF THE INFORMATIONAL STRATEGY

*Step 1 of the strategy.* As described previously, the first part of the informational antilittering strategy sought to achieve a high motivation for a



**Figure 1: The Picture of Step 1 of the Two-Step Antilittering Communication Strategy: "Alles im Eimer? [Everything in the Can?]"**

central processing of the information. The message of Step 1, which was presented on the Cinema screen (see Figure 1), read, "Alles im Eimer? [Everything in the can?]"

This message is ambiguous, because, depending on the context, it can have two different meanings. Usually, the message is understood personally and means, "Is everything lost?", "Is it hopeless?", or "Everything gone?". However, it can also be interpreted literally, signifying, "Is everything in the garbage can?" Accordingly, considering its personal meaning, this question possesses a high personal relevance. The literal meaning of the question asks whether all persons have thrown their garbage into the garbage can and, hence, addresses the descriptive littering norm in the cinema hall.

According to the elaboration likelihood model of Petty and Cacioppo (1986a, 1986b), a central processing of information is enhanced by a high motivation for intense cognitive processing. In their model, the personal significance and meaningfulness of an issue is one factor that determines this motivation. As described above, ambiguity can also increase the motivation to search for new information and for an intense cognitive processing of information (Duncker, 1935; Festinger, 1957; Kruglanski et al., 1985). Hence, the stimulus used in Step 1 of the informational strategy was designed



**Figure 2: The Picture of Step 2 of the Two-Step Antilittering Communication Strategy: “Danke! Ihr Cinemax Team [Thank you! Your Cinemax Team]”**

to be both ambiguous and possessing a high personal relevance to achieve high motivation for the cognitive processing of the subsequent antilittering information.

*Step 2 of the strategy.* The second picture was projected on the cinema screen immediately (approximately 1 to 2 seconds) following the message of Step 1. It read, “Danke! Ihr Cinemax Team [Thank you! Your Cinemax Team],” and additionally displayed a common sign representing correct waste disposal (a man throwing garbage in a trash can, see Figure 2).

The stimuli given in Step 2 resolved the ambiguity of the question posed in Step 1. The picture clarified that the question of Step 1 referred to its literal meaning and not to its personal meaning. Moreover, by thanking the audience in advance for disposing of their waste correctly, a polite appeal for help and compliance with the injunctive antilittering norm was made. First, this message should make the injunctive norm salient and, hence, induce a cognitive focus on the injunctive antilittering norm. The motivation for a central processing of the information, which had been induced by Step 1, should also support a focus on the injunctive norm by enhancing the active search for the corresponding information and by preventing distraction. Second, it was

assumed that there exists a fit between the polite communication strategy appealing for help and the internal standards of the recipient. This fit should elicit the motivation for the intended antilittering behavior. The induction of cognitive motivation by Step 1 should also support the fit between communication strategy and internal norms of the subjects. It was assumed that the originality and novelty of the appeal and also the rewarding relief of cognitive tension connected to the message of Step 2 would correspond to the internal standards held by the audience in a cinema.

As explained, the two-step communication strategy, which was used in the experimental condition, was designed to be consistent with the hypothesis stated above. Therefore, it was expected that the strategy would achieve a reduction in the littering behavior of the audience.

## RESULTS AND DISCUSSION

In the experimental condition, the mean weight of litter per person was 18.2 g per person as compared to 25.4 g per person in the control condition. This difference was significant,  $t(19) = 2.52, p \leq .02$ . An additional analysis of variance, including the control variable size of the audience as a covariant variable, replicated the significant difference between the two conditions,  $F(1, 18) = 5.63, p \leq .03$ . Accordingly, the informational strategy of the experimental condition effectively reduced littering behavior. It achieved a 28.3% reduction in the weight of litter per person. The effect of the size of the audience was not significant,  $F(1, 18) = 0.09, p = .77$ . For the design of antilittering campaigns, this result suggests that, in a first step of an informational strategy, ambiguous signs can be effectively included in an antilittering message if this ambiguity is resolved in a subsequent step of the strategy. Presumably, overall, informational antilittering strategies should, indeed, be unambiguous. However, in a first step aimed at motivating people for intense cognitive processing of subsequent information, the ambiguity of a sign might be helpful. The first step of the effective informational strategy of the present experiment represented a message that was both ambiguous and personally relevant. However, these two factors could not be separated in the experiment, because it was the ambiguity of the message that achieved its personal relevance by suggesting a personal meaning. At the same time, the ambiguous question of Step 1 addressed the descriptive littering norm of the cinema hall. This might indicate the effects of restricting designers of antilittering strategies from making unambiguous messages and signs.

The results of the present study are fairly consistent with the results of the experiments of Cialdini et al. (1990) and Reno et al. (1993), who have shown that making an injunctive antilittering norm salient can effectively reduce littering. However, in designing an effective antilittering message, more seems to be necessary than simply focusing the recipients on the injunctive antilittering norm of a place. The results of the present experiment are consistent with the studies of Durdan et al. (1985), Geller et al. (1976), and Reich and Robertson (1979) who have shown that polite formulations appealing for help can be effective in reducing littering behavior. We assume that, in our study, the implicit appeal for help by thanking the audience in advance for correctly disposing of their waste was effective in the present experiment because it corresponded positively with the internal standards of the audience. However, there can exist a variety of internal norms referring to different aspects of a communication strategy, for example, their style, content, and objective. Accordingly, there can exist a variety of characteristics of antilittering messages or signs that might influence their effectiveness, such as novelty, originality, or distinctiveness. In our experiment, the novelty of the informational strategy might well have been crucial for its effectiveness. The novelty or originality of the strategy might (a) correspond to internal standards of the audience, (b) help to attract attention, and (c) elicit positive emotional reactions. Therefore, particularly in a cinema, to repeat the same messages over and over again for a long period of time might prove to be ineffective. The originality or novelty of an antilittering message or sign might often be decisive for its effectiveness (see also O'Neill, Blanck, & Joyner, 1980). The designer of an informational strategy has to consider many variables. The relationship between these variables is not yet fully understood scientifically. Therefore, in addition to psychological theories and the results of psychological research, personal experience and intuition still have to be guiding factors in the design process of antilittering campaigns.

#### NOTE

1. Because of the applied context of the experiment, comparing the efficiency of different communication strategies was not possible. In particular, Cinemax would not agree to intentionally apply a strategy assumed to be defective nor where a fit between the strategy and the internal norms of the audience could not be expected. However, the latter would have enabled a more detailed analysis of the fit concept applied in this article.

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