

WARNING COMPLIANCE: BEHAVIORAL EFFECTS OF COST AND CONSENSUS

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ABSTRACT

Two laboratory experiments were conducted to examine the behavioral effects of cost and consensus on warning compliance. Subjects performed a chemistry demonstration task using a set of instructions that contained a warning directing them to wear a safety mask and gloves. In Experiment 1, cost was manipulated by locating the masks and gloves in either an accessible location (low cost) or a less accessible location (high cost). In Experiment 2, consensus was manipulated by the additional presence of a confederate subject who either did or did not comply with the warning. The results showed reduced compliance to the warning when the cost was high, and that the compliance rate was biased up or down depending on the behavior of the confederate. Implications of this research for facilitating warning effectiveness and safety are discussed.

INTRODUCTION

In their review of the literature on warnings, McCarthy, Finnegan, Krumm-Scott, & McCarthy (1984) concluded that research has failed to demonstrate that warnings are effective. This review produced considerable interest and research on the effectiveness of warnings (e.g., Wogalter, Godfrey, Fontenelle, Desaulniers, Rothstein, & Laughery, 1987). Research has begun to examine the kinds of conditions that facilitate and inhibit warning effectiveness. For example, Wogalter et al. (1987) have shown that warning placement can affect warning compliance. In addition, the factors of imbeddedness in text (Strawbridge, 1986), and salience (Wogalter et al., 1987) have been shown to affect compliance rates.

According to Cunitz (1981) and Peters (1984), product warning labels serve several functions. Warnings inform consumers about the possible dangers associated with the use of a product. Warnings also serve to persuade the consumer to comply behaviorally to the warning's instructions.

The present research begins with the assumption that product warnings represent an attempt to behaviorally influence consumers. Current social psychological theory distinguishes between two kinds of influence attempts. One assumes the target individuals systematically processes persuasive messages, and the other assumes the target individual uses heuristic processing of persuasive messages (Chaiken, 1980; Eagly & Chaiken, 1984). Systematic processors focus on the quality (content) of the persuasive arguments than low quality arguments (Petty, Cacioppo, & Goldman, 1981). In contrast, heuristic processors rely upon simple rules of thumb, or heuristics, to guide their thinking about the quality of a persuasive message. These individuals comply to an influence attempt only if the preconditions of one or more compliance heuristics are satisfied. Because people are exposed to more than 3,000 influence attempts daily (primarily from advertising), even systematic processors, to some extent, must rely on heuristics to guide their judgments about compliance (Cialdini, 1984).

Eagly and Chaiken (1984) have identified five major compliance heuristics, each of which may be employed by the recipient of an influence attempt when deciding whether to be influenced. First, individuals who are confronted with a persuasive message may rely upon the expertness of the source of that message. For example, a physician's advice to change one's diet habits carries more weight than an admonishment from a casual friend. Second, we tend to be susceptible to greater influence from people whom we like than by people with whom we associate little positive affect. This is why advertising using the services of famous, likeable actors are successful in selling products. Third, a target of a persuasive message may evaluate the quality of that message by the sheer number of arguments contained in the message. The target uses the number of arguments as a heuristic to infer their quality, judging that argument quantity is diagnostic of soundness. Fourth, people are influenced by the presence of statistics in support of an argument. As a result, people buy more sugar-free gum when they hear that four out of five doctors recommend it than when they are simply told that chewing sugar-free gum has certain benefits.

The fifth compliance heuristic, consensus (also referred to as, social influence or conformity), is one of the focuses of the present research. People often use the behavior of others to infer the appropriate action for a given situation (Asch, 1955). As a result of consensus, targets observe the behavior of others to judge whether to comply. It implies that individuals will be more likely to comply to a warning when others are doing so. This heuristic also implies the reverse, namely, that individuals will be less likely to obey a warning when they see others ignoring it. The present research examines whether people are likely to be influenced by others when deciding to obey or not to obey warning instructions.

Another factor believed to affect the degree to which an individual is influenced is the perceived cost, in terms of time and effort, associated with the behavior desired by the source of influence. The role of cost has been investigated by previous researchers interested in the determinants of helping behavior (Piliavin, Piliavin, & Rodin, 1976).

These investigators varied the cost associated with engaging in a helping act and found that the higher the cost, the less likely subjects were to offer assistance to a stranger. Cost has also been shown to influence compliance to warning instructions. In a field study (Wogalter et al., 1987), subjects were more likely to disobey a warning on a set of doors when the warning requested that they take a more effortful diversion, and were more apt to comply when the warning requested less effortful behavior. The present research further examines cost on warning compliance, but in this case in a laboratory setting.

The following two laboratory experiments use a chemistry demonstration paradigm (Wogalter et al., 1987) in which subjects followed instructions to mix chemicals under varied conditions. The first experiment examines the effect of cost on warning compliance. The second experiment examines the effect of consensus.

EXPERIMENT 1

The purpose of the first experiment was to examine whether cost would affect warning compliance in a controlled laboratory situation. It is expected that subjects will be more likely to comply to a warning that instructs a low effort activity than a high effort activity.

Method

Subjects. Twenty-three University of Richmond students from an introductory psychology course voluntarily participated to fulfill a course requirement.

Materials. The equipment used to perform the demonstration task included: a triple beam balance, beakers, flasks, a graduated cylinder, a stirring rod, measuring spoons, aluminum foil measuring cups, disposable vinyl gloves and paper surgical masks. Purple and green water (made using food coloring) was contained in two wash bottles labeled Solution A and Solution B. Cannisters labeled Substance A, Substance B and Substance C contained green sugar, corn meal, and yellow powdered sugar. The solutions and substances were disguised to help set an illusion that subjects were mixing potentially hazardous chemicals.

Subjects used set of printed demonstration instructions that included a short description of performance expectations followed by a warning stating: "WARNING: Wear gloves and masks while performing the task to avoid irritating fumes and possible irritation of skin." Under the warning was the specific chemical mixing instructions. There were six steps describing how to measure and mix certain quantities of substances and solutions.

Procedure. Subjects signed consent forms in a small room where, for all subjects, there were many sets of gloves and masks on the only table present. Next, each subject was taken to a nearby room approximately 25 ft (7.6 m) away. This second room had a table containing the chemistry materials. The experimenter told the subjects that they should work as quickly and accurately as possible, that the quality of performance and time to perform the task was being measured. They were also told that if they encountered any problems, to do the best they could. An earlier pilot study yielded no significant effect for high vs.

low cost when subjects were given an unlimited amount of time to perform the task and were allowed to ask the experimenter questions. In the present experiment, subjects were told they would have a time limit of 5 min to complete the task and were asked not to ask questions during this time. Before subjects were given the written instructions, they were asked if they were familiar with a triple beam balance and if not, shown how to use it.

In the low cost condition, masks and gloves were not only in the consent forms, but also in the laboratory demonstration table as well. In the high cost condition, the masks and gloves were in the consent form room only. Subjects were later debriefed.

Results

The independent variable was high vs. low cost. The dependent variable was frequency of subject compliance (i.e., use of mask and gloves). Table 1 shows the observed frequencies and percentages. It is apparent from this table that subjects in the high cost condition complied less often than subjects in the low cost condition. A Chi-Square analysis of frequency showed the effect is significant, $X^2(1, N = 23) = 7.34, p < .01$.

TABLE 1. Frequencies and Percentages of Warning Compliance as a Function of Cost

	Cost			
	Low		High	
Compliance	8	73%	2	17%
Noncompliance	3	27%	10	83%

Discussion

The results of Experiment 1 indicate that a cost of as little as walking 25 ft (7.6 m) to another location can produce lowered warning compliance. These findings are consistent with the Wogalter et al. (1987) field study that showed subjects were more likely to obey a warning when the cost is low than when the cost is high. The results also support the social psychological research on the effects of cost (Piliavin et al., 1976).

EXPERIMENT 2

The goal of Experiment 2 was to examine the effects of social influence on warning compliance. As mentioned in the introduction, social psychological research suggests that persons will be more apt to comply when other persons comply; conversely, people will be less likely to comply when other persons do not comply. In the present research, we investigated the influence of the behavior of one other person, a confederate. It is expected that subjects will be more likely to comply with a warning when the confederate complies than when the confederate does not comply.

Method

Subjects. Seventeen University of Richmond students from an introductory psychology course participated.

Materials and Procedure. The materials and procedure were identical to Experiment 1 except: 1) the equipment needed to perform the task was doubled, 2) only the low cost condition of Experiment 1 was used, and 3) a confederate, acting as another student, participated simultaneously with the subject. The confederate subject either complied or did not comply to the warning.

Results

Table 2 shows the observed frequencies and percentages of subject compliance. It is apparent from the table that subjects more often wore masks and gloves when the confederate complied with the warning than when the confederate did not comply. The Chi-Square analysis for these data is significant, $X^2(1, N = 17) = 8.24, p < .01$.

TABLE 2. Frequencies and Percentages of Warning Compliance as a Function of Confederate Compliance

	Confederate Behavior			
	Compliance	Noncompliance		
Compliance	8 100%	3 33%		
Noncompliance	0 0%	6 67%		

Discussion

Warning compliance was reduced or enhanced depending on the behavior of the other person. Most of the subjects failed to comply when the confederate failed to comply. Although the means to comply were readily available in both conditions (i.e., masks and gloves), subjects tended to model the actions of the other person.

GENERAL DISCUSSION

The results of these studies show that subjects are more likely to comply with a warning: 1) in conditions of low cost than high cost, and 2) when they see another person complying than when they see another person ignoring the warning.

It is possible that subjects did not perceive any risk involved in the laboratory task. However, comments from subjects (e.g., questions about safety, trying to guess the chemical terms for the substances they used) suggests that we validly measured subjects' unwillingness to comply under conditions of some perceived risk.

Our results have several implications. First, it is preferable to have warnings that direct people to behave in

ways that are not effortful. Effort, instead, should be directed in the product design stage to remove the hazard. In cases where the hazard can not be removed, a warning is necessary. As we have seen, the simple presence of a warning does not mean that people will comply with its instructions. The warning should minimize behavioral effort to maximize compliance. Warnings should be tested to determine whether the warning and/or product needs redesign. One way to reduce the behavioral cost is to provide the means to perform the correct behavior. For example, if protective equipment should be used in conjunction with a product (e.g., gloves with oven cleaners), one way to reduce the effort to comply would be to include the required protective equipment. The point is that product manufacturers should not expect that users will put forth effort to obtain the proper safety equipment except when it is convenient to do so.

Our results also show that the behavior of another person has a powerful influence on warning compliance. Compliance is higher when only one other person is seen to comply, and lower when only one other person is seen not complying. Therefore, all persons in potentially hazardous work environments should be encouraged to comply to warnings. For example, in workplace environments where a mask or respirator device is required by warnings, no worker should be seen working without the appropriate protective equipment.

We believe that social influence will have powerful effects in other warning domains and that compliance will be facilitated when others model the appropriate behavior. For example, the present results suggest that the introduction of persons to model the appropriate behavior might increase warning compliance. In short, seeing others do actions promotes similar actions in others. Safe behavior promotes safe behavior.

A comment should be made in regard to the generality of the consensus effect. Our study involved a situation where only one other person produced a powerful influence on warning compliance behavior. Subsequent research is needed to examine the effects of more than one other person on compliance. We would expect that the greater the number of social models present, the greater the consensus effect. However, it is unclear what pattern of effects would be found in cases when some persons are seen to comply to a warning and others are seen to ignore it. We speculate that behavior will be influenced in the direction of the majority and that when there is no clear majority, compliance judgments become increasingly dependent on other cues, possibly involving, the four compliance heuristics mentioned in the introduction. The effects of these and other variables, and their possible interactions, are left for subsequent investigations.

The present studies show that there are ways to influence the effectiveness of warnings (e.g., cost and consensus). Both effects are taken from social psychology. We have taken this approach to enhance our understanding of the factors that mediate the effectiveness of warning instructions. It is our belief that social psychological theory and research provides a useful source of ideas for this important area of research.

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