Pergamon

Accid. Anal. and Prev., Vol. 27, No. 1, pp. 57–64, 1995

0001-4575/95 $9.50 + .00

0001-4575(94)00046-8

EFFECTS OF A VIDEO WARNING SIGN AND SOCIAL MODELING ON BEHAVIORAL COMPLIANCE

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(*Accepted* 9 *December* 1993)

Abstract—Two experiments were conducted to evaluate the effectiveness of different kinds of video presentations as methods to induce behavioral compliance to safety directives. In Experiment 1, the effects of: (i) a video sign warning alone, (ii) a video sign warning plus a role model, and (iii) a video sign warning plus a role model with an added voice warning were examined with respect to compliance with directed safety behaviors. The results indicated that behavioral compliance was significantly higher when participants were exposed to the videos containing the role model compared to the video sign alone. The addition of a voice warning to the sign plus role model condition produced no further increase in compliance over the condition without voice. Experiment 2 examined whether a delay between the time of exposure to the video and the time the safety behaviors were necessary would produce a decrease in compliance. In addition, the influence of a video role model and a voice warning on perceived importance of protective equipment was examined. Experiment 2 showed that a delay of several days did not reduce the effectiveness of a video warning. This result suggests that the behavioral change induced by the video is robust over time. In addition, a significant relationship between perceived importance of using safety equipment and behavioral compliance was demonstrated. Implications of this research for safety training programs and warnings are discussed.

INTRODUCTION

Providing safer conditions for consumers and employees is a central goal and a major challenge for accident prevention programs. One common method used to prevent accidents and injuries is warnings. The purpose of warnings is to prevent people from performing unsafe behaviors that might otherwise occur if warnings are not provided.

Previous research has identified a number of factors that influence the behavioral effectiveness of warnings including: placement (Wogalter et al. 1987), embedding the warning within other text (Strawbridge 1986), social influence of others (Wogalter, Allison, and McKenna 1989), conveying the severity of consequences (Wogalter and Barlow 1990), inclusion of pictorials (Jaynes and Boles 1990), voice accompaniment (Wogalter and Young 1991), and cost of compliance (Wogalter et al. 1989). While warnings usually focus on preventing unsafe behaviors, other research suggests that training programs that instruct and motivate safe behaviors are useful for enhancing compliance (Komaki, Barwick, and Scott 1978; Reber, Wallin, and Chokar 1984). Furthermore, reducing unsafe behaviors and increasing safe ones is of interest to most organizations and society. Unsafe behaviors, caused by misinterpretation of instructions, may result in increased costs stemming from accidents and injuries, lost time and productivity, equipment damage, insurance expenses, and potential litigation.

The combination of warnings that stress the avoidance of unsafe behaviors and training programs, such as behavioral modeling, that stress the performance of safe behaviors might be useful in gaining high levels of behavioral compliance. Behavioral modeling is a technique through which others learn from observing actions of an individual performing the desired behavior. The acquisition and subsequent enactment of behaviors exhibited by others must successfully pass through several stages of processing. First, the individual must attend to the behavior of the model. Second, the individual must retain the information exhibited by the model. Third, the person must have the ability to perform

the observed action. Finally, motivation to perform the modeled behavior must be present. When these four conditions are met, there is an increased likelihood that the observer will engage in behaviors similar to the model's (Baron 1992).

The influence of behavioral modeling has been examined across several domains. For example, Wogalter et al. (1989) conducted two studies to examine the effects of another person (a confederate working with the experimenter) performing the tasks on behavioral compliance. Participants in that study performed a laboratory chemistry experiment while the other person (the model) either used or failed to use protective equipment (i.e. mask and gloves) as directed by a warning. The results indicated that participants were more likely to wear the safety equipment when the other person also used the equipment and were less likely to use the protective equipment when the other person failed to use the equipment. In addition, the results of a field study confirmed the social influence effect. Specifically, participants were more likely to perform the behavior directed by a warning (use the stairs rather than an elevator) when the confederate heeded the warning than when the confederate did not.

Although research on behavioral modeling has supported the effect of social influence on behavioral compliance with safety measures, both studies discussed above utilized live models. Live models can be quite costly to employ in many kinds of training programs (e.g. in companies with few employees). In addition, in situations where employees are involved in potentially dangerous work, initial training should take place in a safe setting. Currently, it is unknown whether the use of other methods such as videos would enhance behavioral compliance. In recent years, videotapes have become a commonly used method to train individuals on the importance of safety behavior and to provide examples of safe and unsafe behaviors. However, the effectiveness of video-based training programs rarely receives formal evaluation by companies that produce or employ them. Moreover, no research to date has been published on whether safety videos actually do enhance the instructed safety behavior.

Thus, one purpose of the present study is to examine the effects of behavior modeling presented through a videotape that simulates the type of behaviors often used in safety training interventions. Its influence on behavioral compliance to safety directives is examined in comparison to conditions in which only a static warning is shown on the videotape.

In order to maximize the effects of modeling, Wexley and Latham (1991) suggested that individuals should be cued to attend to the specific, relevant behaviors being modeled. One way to call attention to visual information is to use voice. Voice warnings may serve as a salient cue that focuses attention on appropriate behavior, in this case, the behavior of the model. Moreover, past research has shown that simultaneously providing a voice warning message together with the same message visually presented in a print warning (i.e. the message is redundant in the two modalities) produces higher levels of compliance than the voice or print warning alone (Wogalter and Young 1991). In addition, other research has shown substantial influence of voice warnings on compliance (Wogalter et al. 1991; Wogalter, Kalsher, and Racicot 1993a). Thus, a second purpose of this research is to examine the effects of adding a voice warning to a video modeling presentation on compliance with safety instructions.

Two experiments are presented that examine the effectiveness of video-modeling and a voice warning on behavioral compliance. The second experiment also examines the effect of a time delay between training and task performance on compliance. Compliance with the use of safety equipment (mask and gloves) as directed by the warning is assessed in both studies.

EXPERIMENT 1

Three conditions were used to examine behavioral compliance. In the first condition, individuals were exposed only to a video of a static warning sign. In the second condition, individuals were first presented with the same sign and then a videotaped model performing the target behavior (i.e. donning mask and gloves). The third condition included the sign, the videotaped model, and a voice warning.

Method

Participants. Thirty-six undergraduate students from Rensselaer Polytechnic Institute participated for research credit in their introductory psychology course or were paid $5.00 for their participation. Individuals were randomly assigned to one of three conditions (n = 12). All persons in the experiment participated individually.

Materials. The task that participants performed is similar to that employed in Wogalter et al. (1987; 1989). In a simulated laboratory environment, participants used a triple-beam balance, beakers, flasks, and graduated cylinders to weigh, measure, and mix several substances. The substances were disguised to appear potentially hazardous but were actually safe (e.g. powdered sugar with green food coloring). A large supply of plastic gloves and face

masks were also available on a laboratory table next to the equipment.

Two videotapes were constructed. In one, only a full screen shot of a static warning sign was presented for 30 seconds. The warning sign used was identical to one of the signs used in research conducted by Wogalter et al. (1991; 1993a) and contained the message: "CAUTION. Skin and Lung Irritant. Improper mixing may result in a compound that can burn skin and lungs. Wear rubber gloves and mask." The warning was presented in bold black print on a bright, highly saturated yellow background. In the second (role-model) video, the warning sign was displayed for 10 seconds, followed by a full screen shot of several gloves and mask for 8 seconds, and then followed by a 12-second clip showing a 20- to 30-year-old male approaching a table and putting on a mask and a pair of gloves. The presentation of the two videotapes described above constituted two conditions in the experiment. Both lacked sound. In the third condition, the same role-model video was used, except that during the 10-second shot of the sign, the sound of a male voice could be heard presenting the same warning message as the sign. Participants viewed the video before entering the laboratory room. Other than the videos, there were no additional warning messages. Participants watched the video on a 48 cm diagonal color monitor at a distance of 2 m. In all experimental conditions, the duration of the videotaped presentation was held constant at 30 seconds.

Participants were also asked to complete a questionnaire that asked whether or not they noticed the protective equipment (gloves and/or masks) and whether they recalled hearing or seeing a warning. These items were scored on a dichotomous scale (yes = 1; no = 0).

Procedure

Participants were asked to read and sign a consent form that described the study as investigating the procedures and equipment involved in a chemistry laboratory task; they were then shown one of the three videotapes. After viewing the tape, they were asked to wear a white lab coat and then were shown how to use a triple-beam balance. The experimenter told the participants to perform a set of steps listed on an instruction sheet in the next room as quickly and accurately as possible, and then escorted them to the doorway, pointed to the laboratory table, and told them to enter the room and begin. The experimenter recorded whether the participants wore the protective gear as directed by the previously viewed videotapes.

After completing the steps of the chemistry task, participants were asked to complete the questionnaire.

Results

All participants who wore one piece of safety equipment also wore the second piece (i.e. both gloves and mask). In the video-warning-sign-only condition, 50% of the participants wore the protective equipment. In the video-sign-and-role-model condition, 92% complied. In the condition in which voice was added to the warning-sign-and-role-model video, 100% compliance was obtained. The overall chi-square test for the compliance data was significant, χ^2 (2, $N = 36$) = 10.99 $p < .01$. Specific contrasts indicated that compliance was higher in the two video/role-model conditions (video sign/model and the video sign/model/voice conditions) as compared to the video-sign-alone condition, χ^2 (1, $N = 36$) = 5.04, $p < .05$, and χ^2 (1, $N = 36$) = 8.00, $p < .01$, respectively. The contrast between the two role-model conditions (with and without voice) was not significant.

The questionnaire data indicated that most participants who reported seeing the safety equipment (i.e. the gloves and masks) or reported hearing or seeing a warning, complied with the warning. Specifically, 85% of subjects who reported seeing both the mask and gloves complied with the warning. In addition, 87% of the participants who reported that they either saw or heard a warning complied.

Discussion

Almost all of the participants in the role-model conditions performed the precautionary actions illustrated in the video. This result confirms the powerful social influence effect previously reported in the warnings literature (Wogalter et al. 1989) but the present study also extends this earlier work. The earlier research used live models who simultaneously performed the task along with the participants. In the current study, the same effect was accomplished by a video presented before the task and outside the context of the laboratory room.

While the addition of a voice warning to the role-model video increased compliance compared to the condition without voice warning (from 92% to 100%) the increase was not statistically significant. The failure to find a significant difference is somewhat surprising given that voice warnings have been found to strongly influence compliance in earlier research (Wogalter et al. 1991; 1993a; Wogalter and Young 1991). This null finding was most likely due to a ceiling effect as the role-model had already pushed performance near complete compliance.

EXPERIMENT 2

In addition to the type of media used in the video warnings, the effect of a delay between the time of training and the time the safety behavior is required is also of interest. For example, in most situations, training is provided before new employees begin work on a new job. It is usually expected that the information acquired from the training will be maintained over time and that the employees will consistently use the instructed behavior. That is, in real-world situations, it is unlikely that individuals will watch a videotape each time the relevant behavior is employed. If the information learned is not retained over time, then the usefulness of videotape training would be questionable. Therefore, it is important that the behavior learned be retained over time (cf. Wexley and Latham 1991). One purpose of Experiment 2 was to examine whether a time delay between exposure to the videotape and performance of a task requiring the instructed behaviors affects compliance.

Although the addition of a voice warning in Experiment 1 failed to produce a significant increase in compliance, it is possible that redundant messages may be more important in situations where a delay is present. That is, any reduction in compliance that may result from the delay may be lessened by the addition of the voice warning. Thus a second purpose of Experiment 2 was to examine the effects of redundant messages (i.e. modeling and voice) when there was a delay.

The concept of retention implies that information was learned through the training and that this information is maintained in memory and later translates into appropriate behavior (Wexley and Latham 1992). In many training situations, an additional goal is to teach employees the importance of using safety equipment so that they will deem its use to be relevant under the appropriate circumstances. Therefore, a third purpose of Experiment 2 was to examine the effects of the warning manipulations on the perceived importance of using safety equipment. Perceived importance is an indication of an individual's beliefs or attitude toward using safety equipment. According to some models of persuasion, changes in beliefs or attitudes are necessary precursors to lasting changes in behavior (e.g. Ajzen and Fishbein 1980). Thus, changes in belief regarding the importance of using protective equipment should co-occur with changes in the use of the equipment. If so, measurement of beliefs could be used to predict subsequent behavior and would therefore be a useful evaluation tool to measure the effectiveness of videotape training in producing the desired behavior at later times.

In summary, Experiment 2 reexamines the effects found in Experiment 1 and also examines the effect of time delay on compliance and the perceived importance of wearing safety equipment. Seven conditions were employed to examine three factors: (i) warning media (video alone or video and voice combined), (ii) time of task performance (immediate versus delayed), and (iii) time the importance test was given (at the end of Session 1 versus delayed test at the end of Session 2). The third variable was included because of concern that early assessment of perceived importance (in Session 1) might cue the appropriate behavior in Session 2. In order to assess the effects of delayed task performance only, without potential contamination from cuing, some of the subjects were assigned to conditions in which they completed the perceived information questionnaire during Session 1 while others completed the test only at Session 2. A no-warning control condition was also included. Compliance with the use of safety equipment (mask and gloves) during a chemistry task was assessed. Knowledge of the importance of following safety procedures was assessed by means of a paper and pencil questionnaire for all conditions.

Method

Participants. Eighty-five undergraduate students from Rensselaer Polytechnic Institute volunteered to participate in this study. Individuals were randomly assigned to one of the seven conditions listed in Table 1 ($n = 12$ for Conditions 2, 4, 6, and 7; $n = 13$ for Conditions 3 and 5; $n = 11$ for Condition 1). All sessions were conducted with individual participants.

Materials. The materials employed were identical to those of Experiment 1 except for the inclusion of a questionnaire assessing perceived importance of wearing gloves and perceived importance of wearing a mask. Both items were measured using a 7-point Likert-type scale ranging from 1 (not at all important) to 7 (very important). The two items were summed to create a total score ranging from 2 to 14.

Procedure. Participants signed up for two sessions, no less than three and no more than seven days apart. Participants were asked to read and sign a consent form that described the study as investigating the procedures and equipment involved in a chemistry laboratory task. The procedure was identical to that used in Experiment 1 except for the inclusion of the delay variable and the perceived importance questionnaire. An outline of the testing sequence can be seen in Table 1 and is described below.

Table 1. Mean proportion compliance and perceived importance scores as a function of warning condition

Session 1				Session 2			
Condition number	Condition description	Proportion compliance	Mean perceived importance scores	Condition number	Condition description	Proportion compliance	Mean perceived importance scores
1	No-warning/perform task (control group)	.18	9.82 (3.66)	1	No Session 2	—	—
2	Video only/perform task	.75	—	2	Perform task/perceived importance questionnaire	.67	10.00 (3.44)
3	Video only/perceived importance questionnaire	—	12.15 (2.48)	3	Perform task/perceived importance questionnaire	.61	11.46 (3.38)
4	Video only	—	—	4	Perform task/perceived importance questionnaire	.75	11.83 (2.25)
5	Video and voice/perform task	.77	—	5	Perform task/perceived importance questionnaire	.84	11.23 (3.14)
6	Video and voice/perceived importance questionnaire	—	12.08 (2.15)	6	Perform task/perceived importance questionnaire	.75	12.08 (1.51)
7	Video with voice only	—	—	7	Perform task/perceived importance questionnaire	.77	12.08 (2.28)

Note: For Conditions 2, 4, 6, and 7, $n = 12$, for Conditions 3 and 5, $n = 13$, and for Condition 1, $n = 11$.

In Session 1, all participants viewed one of the two role-model videos (with or without voice) except for those in the no-video (control) condition. Only participants in three of the seven conditions performed the chemistry task during the first session (Conditions 1, 2, and 5). Also in Session 1, participants in Conditions 3 and 6 completed the perceived importance test. In Session 2, all participants, except for the participants in the no-video (control) condition, returned to the laboratory three to seven days later to perform the chemistry task followed by the perceived importance test. The control condition was used to establish a baseline level of compliance.

Results

Most subjects who wore one piece of safety equipment also wore the second piece (i.e. both gloves and mask). The correlations for wearing gloves and mask in Sessions 1 was Φ (36) = .95, $p < .001$, and in Session 2 was Φ (74) = .90, $p < .001$. Thus, to simplify presentation of the results, compliance is hereafter defined as wearing at least one piece of equipment.

Behavioral compliance

Initial analysis examined compliance differences between the three conditions that performed the chemistry task in Session 1 (Conditions 1, 2, and 5). A one-way between-subjects analysis of variance (ANOVA) showed a significant effect, $F(2, 33) = 6.81$, $p < .01$. Subsequent comparisons among conditions showed that both video conditions produced significantly greater compliance than the control condition ($p < .01$) but that the two video conditions did not differ from one another.

The remaining analyses of the compliance scores focused on comparisons among the six video-present conditions. Analysis of the timing of questionnaire administration (at the end of Session 1 versus after task performance in Session 2) showed no effect on behavioral compliance, $F < 1$ (Conditions 3 and 6 versus Conditions 4 and 7), therefore, no further analyses were conducted based on this factor.

Two analyses were performed to examine the effect of task delay on compliance. The first analysis was a between-subjects comparison of groups who immediately performed the task versus those who performed only after a delay (Conditions 2 and 5 in Session 1 versus Conditions 3, 4, 6, and 7 in Session 2). The ANOVA showed no difference in compliance between Session 1 and Session 2, $F < 1$. Another analysis examining the effect of delay involved a repeated-measures ANOVA on those participants who performed the task twice (Conditions 2 and 5 at both Sessions 1 and 2). This analysis showed no significant effect, $F < 1$.

A between-subjects analysis was used to examine the effect of voice (Conditions 2, 3, and 4 versus Conditions 5, 6, and 7 in Session 2). Although somewhat higher compliance was observed in conditions in which voice was added to the videotape (68% for video alone versus 78% for video with voice), the comparison was not satistically significant.

A mixed-model ANOVA was used to examine whether compliance differed between the two sessions as a function of the presence of voice in the video (Sessions 1 and 2 for Conditions 2 and 5). Although there was a trend for higher compliance in Session 2 than Session in 1 when voice was present and an opposite trend when voice was absent, the ANOVA showed no significant effects.

Perceived importance

Because the ratings of importance of wearing the mask and gloves were highly correlated ($r(34) = .93, p < .001$ for Session 1; $r(72) = .82, p < .001$ for Session 2), the separate data for the individual ratings of mask and gloves were collapsed into overall mean importance scores. The overall importance means are shown in the right-hand column of Table 1. Moreover, the correlation between test scores in Session 1 and Session 2 was significant, $r(25) = .47, p < .01$. The perceived importance scores were analyzed in similar ways as the compliance scores, however, none of the ANOVAs showed significant effects of delay for those participants who completed the questionnaire twice.

Analyses examining the relationship between the perceived importance scores and behavioral compliance produced some interesting results. The correlation between perceived importance scores in Session 1 and compliance in Session 2 (Conditions 3 and 6) was significant, $r(25) = .43, p < .05$. Also, the correlation between perceived importance and compliance in Session 2 (Conditions 2 through 7) was significant, $r(74) = .43, p < .001$.

In order to examine further the effects of perceived importance on compliance, participants in conditions 3 and 6 were dichotomized on the variable of compliance (i.e. compliers versus noncompliers) and differences in test scores for these 2 groups was examined. Conditions 3 and 6 were used because these groups completed the perceived importance questionnaire in Session 1 but did not peform the chemistry task until Session 2. Thus, the effects of retention of videotape safety directives on behavioral compliance could be examined without any potential confound from cuing. The results indicated that individuals who complied with safety behavior had significantly higher perceived importance scores than those who did not comply, $t(25) = 2.30, p < .05$, ($M = 12.72$ versus $M = 10.57$, respectively).

Discussion

Experiment 2 produced several findings that extend the results of Experiment 1. First, the results showed significantly higher compliance for individuals exposed to the videotape compared to individuals in a control group who were not exposed to the videotape. This finding indicates that the videotape was an effective method of communicating and motivating viewers to act in a safe manner while performing the task.

Second, the results showed that the information acquired through the videotape was not only effective immediately following exposure, but also several days to a week later. Without this demonstration of information retention over a delay period, the utility of safety training via videotapes would be in question, as it is usually the case that safety behaviors are needed well beyond the immediate training periods.

Third, like Experiment 1, this experiment failed to find a significant effect of voice when it was added to the videotape presentation. Compliance was already very high with the videotape alone, which probably limited the ability of voice to increase compliance further. If compliance had dropped in the second sesssion, there might have been more room for the voice warning to show an effect. Perhaps further investigations with longer delays than that used in the present research would demonstrate a positive influence of voice.

Fourth, the perceived importance of wearing protective equipment was examined. No significant effects of conditions were found, but several important relationships with the compliance measure were noted. One is the finding that individuals who complied also gave higher ratings of perceived importance. Perhaps more important is the relationship between the perceived importance scores recorded in Session 1 with subsequent compliance in Session 2. This finding indicated that evaluation of people's attitudes regarding the trained safety behaviors following videotape exposure is a useful predictor of subsequent use of the behavior. Thus, this measure could be useful as a cost-effective method of evaluating the effectiveness of safety training and could identify those individuals who might need further training and evaluation.

GENERAL DISCUSSION

Almost all of the participants in the role-model conditions in Experiment 1 performed the precautionary actions illustrated in the video. This result confirms the substantial social influence effect previously reported (Wogalter et al. 1989) but also extends this work. The earlier study used live models who simultaneously performed the task along with the participants. In the current study, the effect was accomplished by a video presented before the task and outside the context of the laboratory room.

The voice warning did not further enhance the effect of the role-model video. This null finding was most likely due to a ceiling effect caused by the strong effect of video modeling, which produced almost complete compliance. The high rate of compliance in the video model conditions indicates how powerful training videos can be in encouraging the proper use of safety procedures. It should be pointed out that, although not statistically significant, a small

percentage increase from the use of a voice warning may be practically significant from a safety point of view. For example, in a company that employs a large number of people, even a small increase may translate into large savings as a result of decreased accidents and liability.

Results of the questionnaire data of Experiment 1 suggest that when individuals notice safety equipment and warnings, they are more likely to engage in safe behaviors. The implication of this finding is that safety equipment should be readily apparent to persons who work on potentially dangerous tasks. Otherwise, people may not make the effort to look for the equipment (Wogalter et al. 1989).

Experiment 2 replicated the finding of Experiment 1 that a modeling videotape positively influences compliance. In addition, Experiment 2 showed that information acquired through a modeling videotape was retained over time. This finding has several implications for training experts using videotapes to improve safety behavior. The results indicated that even a short videotape can produce changes in perceived importance and behavior. Furthermore, the inclusion of a short test that assesses information acquired through training may be useful in predicting who will actually change their behavior as a result of videotape training. In cases where safety directives are not perceived as important, further training may be needed to improve compliance with safety procedures.

It should be noted that compliance was somewhat lower in Experiment 2. It is not clear why compliance, in comparable conditions, was lower in the second experiment. One possibility is the different sample sizes in the two experiments. A related possibility is that the differing levels of compliance are simply due to sampling error.

The results of the current research, together with the findings of Wogalter et al. (1989), lends support for the potential effectiveness of training videos used to encourage and teach the use of safe behaviors in the workplace. With the advent of relatively inexpensive hand-held camcorders and video equipment, it is possible to produce videos that not only show dangers one should look out for but also the appropriate ways to avoid them. The cost of producing and implementing safety videos would be substantially lower in terms of employee injury, staff reduction, and any subsequent liability litigation that might occur as a result of a preventable injury. Moreover, the utility of a safety video is not limited to employee safety programs. Many households now contain a video player, and therefore, inexpensive videos could be enclosed with certain consumer products that might better communicate its operation and potential hazards than an instruction manual.

Limitations and suggestions for future research

The current research addressed the effect of social influence on behavioral compliance through modeling. However, an alternative explanation for the effect could involve the vividness of the stimuli used. Specifically, the modeling videotape was more dynamic and vivid than the static video warning sign used in the experiments (cf. Nisbett and Ross 1980). However, recent research using a similar (chemistry laboratory) task failed to find a compliance effect attributable to the addition of a strobe light (Wogalter et al. 1993a) or the use of dynamic displays (Wogalter et al. 1993b). Although there were several differences between the present research and those studies (e.g. they used actual electronic signs rather than video), the benefit of the video model does not appear due simply to its dynamic and vivid qualities compared to the sign-only condition. Furthermore, the purpose of the current research was to compare the effectiveness of video-modeling to a static sign. Since many companies use videos and static signs, it is important to determine the increase in compliance that can be gained by adding videotapes to an effort aimed at improving behavioral compliance. Future research could focus on how different combinations of the video modeling components affect compliance to determine the most important elements and how they interact. Nevertheless, the utility of the more global presentation of a video model should be considered important in its own right, having practical application to a wide range of safety programs.

One final limitation concerns the generalizability of findings from a laboratory study to the field. Although external validity may be an issue, very little research has been conducted that examines the utility of videotape training for improving behavioral compliance. Since this research was somewhat exploratory, it seemed appropriate to begin in the laboratory where we could gain greater control over the manipulated variables. In addition, previous research using live models in an applied setting indicated that similar findings occur in both lab and field settings (Wogalter et al. 1989).

Future research that uses longer time spans between training and behavioral observation is also needed to further examine the effects of such training on retention. Future research that focuses on different video formats, type of information presented, and order of information presentation to determine the most effective videotape training tools would also be useful. Comparing the effectiveness of videotapes to instruction manuals in achieving

behavioral compliance to warnings included in consumer products is another area for future research.

Acknowledgements—The authors would like to thank Raheel Rashid and Bruce Cramer for their assistance in data collection. Portions of this manuscript were presented at the 1992 Human Factors Society Meeting held in Atlanta, GA. Requests for reprints can be sent to either author.

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