

## Effects of High and Low Fear-Arousing Communications upon Opinions toward Smoking

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Three studies (Janis and Feshbach, 1953; Haeffner, 1956; Janis and Terwilliger, 1962) have all reported that high fear-arousing communications are less persuasive than low fear-arousing communications. The Janis and Feshbach study dealt with the effect of tooth decay, the Haeffner study with the destructive capabilities of hydrogen weapons, and the Janis and Terwilliger study with the relation between smoking and lung cancer. The results from all of these studies have been interpreted as being consistent with the Janis and Feshbach (1953) hypothesis that a high fear-arousing communication produces defenses against thinking about the material or toward minimizing the importance of the material contained in the persuasive communication.

Two additional studies have qualified the above interpretation to some extent. Berkowitz and Cottingham (1960) obtained evidence indicating that a high fear-arousing communication may not differ significantly in effectiveness from a low fear-arousing communication if the latter communication is of low interest value. DeWolfe and Governale (1964) obtained evidence which they interpret as being consistent with a hypothesis put forward by Janis and Feshbach (1954). According to this hypothesis, if a persuasive communication contains reassuring recommendations as to how threat can be averted, fear can be expected to facilitate attitude change.

The present study attempts to qualify still further the hypothesis that a high fear-arousing communication produces defensive reactions against thinking about the material contained in the communication. This qualification concerns the difference between the situation in which a high fear-arousing communication has as its major purpose the prevention or avoidance of possible future activity as opposed to the situation in which the high fear-arousing communication has as its major purpose the changing, stopping, or punishing of currently on-going activity. Strong defensive reactions would be expected only in the latter punishment situation. Furthermore, in the avoidance situation the high fear-

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arousing communication may benefit from greater attention-getting and motivating qualities, which when coupled with a lack of aroused defensiveness, may make it more persuasive than a low fear-arousing communication.

If this theorizing is correct it should be the case that a high fear-arousing communication will be more effective than a low fear-arousing communication in preventing smoking in nonsmoking adolescents. The present experiment is concerned with the testing of this hypothesis. Janis and Terwilliger (1962) have already demonstrated that with a population of subjects, 64.5% of whom were smokers, a high fear-arousing communication was less persuasive than a low fear-arousing communication.

## METHOD

### *Communications*

Two communications, a high fear-arousing communication and a low fear-arousing communication, approximately equal in length (2,100 words) and in amount of factual information, but differing in amount of stressful material, were used.<sup>3</sup> Both of the communications, which were accompanied by illustrative slides, argued that smoking results in a number of disorders such as cancer of the lung, lip, tongue, and throat as well as heart disease and emphysema. While the low-stress communication presented the material factually and dispassionately the high-stress communication made the material personally threatening by putting it in a "it could happen to you" frame of reference. The slides accompanying the high fear-arousing communication were colored pictures of cancerous body parts (lips, tongue, mouth, throat, and lungs) while the slides accompanying the low fear-arousing communication were black and white photomicrographs of diseased tissue from the same anatomical areas.

The differential emotional impact of the communications was assessed by having the Ss, after answering all the opinion questions below, make two ratings: pleasantness-unpleasantness of the communications and feelings of nervousness-calmness while the communications were being presented. Both ratings were made on 9-point scales.

### *Dependent Variables*

The experiment involved two dependent variables: opinion about future smoking behavior and opinion about the effect of smoking upon health. The first dependent variable was measured by summing the responses to four questions:

- (1) If your best friend offered you a cigarette and a light would you accept?

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<sup>3</sup>The two communications used in the present study have been deposited with the American Documentation Institute. Order Document No. 7175 from ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington 25, D. C., remitting in advance \$1.25 for microfilm or \$1.25 for photocopies. Make checks payable to: Chief, Photoduplication Service, Library of Congress.

- (2) If you were at a teenage party in which everyone was smoking and the host or hostess offered you a cigarette and a light would you accept?
- (3) Will you ever try smoking cigarettes?
- (4) Will you become a regular smoker?

Responses were made on 9-point scales ranging from "definitely and absolutely not" to "definitely and absolutely yes."

The second dependent variable was measured by summing similar 9-point scale responses to three questions:

- (1) Do you believe that smoking causes lung cancer?
- (2) Do you believe that smoking causes heart disease?
- (3) Do you believe that smokers die earlier than non-smokers?

### *Independent Variables*

Four independent variables were manipulated in the experiment: fear (high or low), time (immediately after or one week after), academic aptitude (high, medium, or low), and sex. All of the variables, except time, involved between *S* rather than within *S* comparisons. The aptitude groupings were made on the basis of scores obtained on the Cooperative School and College Ability Tests (SCAT). The mean high-aptitude score was 97.6, the mean medium-aptitude score, 86.3, and the mean low-aptitude score, 66.6.

### *Subjects*

The *Ss* were seventh grade students from a Honolulu school. In order to verify that the *Ss* were nonsmokers they were asked, five weeks prior to the presentation of the communications, whether or not they had ever tried smoking. Responses were made in terms of one of four alternatives: "many times," "a few times," "once or twice," and "never."

### *Procedure*

A before-after design was utilized in which the dependent variables were measured five weeks before, immediately after, and one week after the presentation of the communications. The *Ss* heard the taped communications, which were recorded and administered by their regular science teacher, as part of a unit on disease. Since the teacher, one of the co-authors of this study, customarily tape recorded many of her presentations the procedure was not unusual or suspicious.

In as much as the classes contained equal numbers of males and females and were ranked according to SCAT scores, the sex and aptitude variables were simply taken advantage of. The students were not experimentally re-grouped for the study. Nine *Ss* were absent during one or more of the three testing periods. In order to obtain an equal *N* in the 12 cells, 13 *Ss* were randomly eliminated giving a total *N* of 144.

The first administration of the questionnaire measuring the dependent variables was represented as a survey by the University of Hawaii on attitudes toward smoking among all seventh grade school children in Hawaii. The second administration was represented as an attempt by the teacher to ascertain how the class felt about smoking. And the third administration was represented as an attempt to see if the students had "changed their minds" during the intervening

week. All of the completed questionnaires were supposedly but not actually anonymous.

### RESULTS

Responses to the question about frequency of smoking are presented in Table 1. Only 6 out of 144 Ss admitted having smoked many times. By far the majority of the Ss claimed to have never smoked or to have tried smoking only once or twice.

TABLE 1  
FREQUENCY DISTRIBUTION OF RESPONSES TO THE QUESTION, "HAVE YOU EVER TRIED SMOKING?"

Many times	Few times	Once or twice	Never
6	21	74	43

The means of the emotional ratings are given in Table 2 and analyses of variance of these data in Table 3. In the analysis of the nervous-calm ratings the only significant effect is the one for the difference between communications ( $F = 23.07$ ,  $p < .01$ ). This indicates that the Ss felt more nervous during the presentation of the high fear-arousing communication than during the presentation of the low fear-arousing communication. In the analysis of the unpleasant-pleasant ratings the difference between communications is again significant ( $F = 25.83$ ,  $p < .01$ ) as well as the difference between aptitude levels ( $F = 4.02$ ,  $p < .05$ ). The communications effect means that the Ss regarded the high fear-arousing communication as more unpleasant than the low fear-arousing communication. The unexpected significant difference in aptitude levels indicates that the medium groups regarded both communications as most unpleasant and the low groups regarded both communications as least unpleasant.

Three-factor analyses of variance of the initial measurements of the two dependent variables revealed no significant differences for the opinion about future smoking behavior variable, and no significant main effects for the opinion about the effect of smoking upon health variable. For the latter dependent variable, however, there are two unexpected significant first order interactions: aptitude  $\times$  sex ( $F = 5.55$ ,  $p < .05$  with 2 and 132 *df*) and aptitude  $\times$  communications ( $F = 3.93$ ,  $p < .05$  with 2 and 132 *df*). The former interaction indicates that in the high-aptitude groups the females thought smoking more harmful than the males, while in the medium- and particularly in the low-aptitude groups the females thought smoking less harmful than the males. The latter

TABLE 2  
 MEAN EMOTIONAL RATINGS IN EACH OF THE TWELVE INDEPENDENT GROUPS<sup>a</sup>

	High aptitude			Medium aptitude			Low aptitude					
	Male		Female	Male		Female	Male		Female			
	High fear	Low fear	High fear	Low fear	High fear	Low fear	High fear	Low fear	High fear			
Nervous-calm	4.50	3.66	6.67	6.00	4.83	4.00	5.33	4.17	5.33	3.25	5.75	3.67
Unpleasant-pleasant	8.92	5.67	8.33	3.42	7.67	5.92	8.00	6.75	5.50	5.08	7.92	5.75

<sup>a</sup> Five designates the neutral points of the scales.

TABLE 3  
ANALYSES OF VARIANCE OF THE EMOTIONAL RATINGS

Source	df	Nervous-calm		Unpleasant-pleasant	
		MS	F	MS	F
Aptitude (A)	2	0.09		19.40	4.02*
Sex (S)	1	11.67	2.56	16.00	3.31
Communications (C)	1	105.06	23.07**	124.69	25.83**
A × S	2	1.38		8.40	1.74
A × C	2	4.52		7.92	1.64
S × C	1	7.56	1.66	0.11	
A × S × C	2	5.15	1.13	6.17	1.28
Within	132	4.55		4.83	

\*  $p < .05$ .

\*\*  $p < .01$ .

interaction, aptitude × communications, indicates that the Ss in the high- and low-aptitude groups who were later exposed to the high fear-arousing communication considered smoking less harmful than did the Ss later exposed to the low fear-arousing communication, while these differences were reversed in the medium-aptitude groups.

Mean before-after change scores for each of the two dependent variables are presented in Table 4, and analyses of variance of these data in Table 5.

In the analysis of opinion about future smoking behavior the predicted difference between communications is significant ( $F = 7.58$ ,  $p < .01$ ). The high fear-arousing communication was more persuasive than the low fear-arousing communication. Two additional significant effects are aptitude ( $F = 4.28$ ,  $p < .05$ ) and the interaction between communications and time ( $F = 5.80$ ,  $p < .05$ ). The former effect indicates that regardless of communication type the medium- and high-aptitude groups changed more than the low-aptitude groups. The latter interaction effect indicates that the difference between the amount of opinion change in the high and low fear-arousing groups decreased over time. This decrease was due both to decreasing change among the Ss in the high fear-arousing conditions and to increasing change among the Ss in the low fear-arousing conditions.

Only two effects are significant in the analysis of opinion about smoking and health: time ( $F = 10.49$ ,  $p < .01$ ), and the interaction between time and sex ( $F = 5.21$ ,  $p < .01$ ). These effects indicate that the amount of change decreased over time for all Ss, but that the decrease was significantly greater for females than for males.

TABLE 4  
 MEAN BEFORE-AFTER CHANGE SCORES FOR THE TWO DEPENDENT VARIABLES: OPINION ABOUT FUTURE SMOKING BEHAVIOR AND  
 OPINION ABOUT THE EFFECT OF SMOKING UPON HEALTH

	High aptitude						Medium aptitude						Low aptitude					
	Male			Female			Male			Female			Male			Female		
	High fear	Low fear	High fear	High fear	Low fear	High fear	High fear	Low fear	High fear	High fear	Low fear	High fear	High fear	Low fear	High fear	High fear	Low fear	
Smoking behavior																		
Immediate	5.17	3.83	5.83	1.50	5.00	3.42	6.33	2.67	4.33	4.08	2.17	4.33	4.33	2.67	4.33	2.17	4.33	
Delay	6.08	4.17	4.58	2.58	4.00	3.83	4.50	4.50	4.08	4.08	4.50	4.08	4.08	4.50	4.08	2.50	1.92	
Smoking and health																		
Immediate	4.00	1.75	4.75	3.58	2.17	4.50	4.08	4.17	4.33	4.08	4.17	4.33	4.33	4.17	4.33	6.58	4.00	
Delay	3.92	1.75	1.92	2.42	3.00	3.58	0.92	2.67	2.50	0.92	2.67	2.50	2.50	1.17	2.50	4.50	4.17	

TABLE 5  
ANALYSES OF VARIANCE OF THE TWO DEPENDENT VARIABLES: OPINION ABOUT FUTURE  
SMOKING BEHAVIOR AND OPINION ABOUT THE EFFECT OF SMOKING  
UPON HEALTH

Source	df	Smoking behavior		Smoking and health	
		MS	<i>F</i>	MS	<i>F</i>
Aptitude (A)	2	234.82	4.28*	7.10	
Sex (S)	1	0.12		50.84	1.78
Communications (C)	1	415.68	7.58**	31.34	1.10
Time (T)	1	9.39		77.09	10.49**
A × S	2	23.84		56.06	1.96
A × C	2	26.57		63.76	2.23
A × T	2	7.46		0.51	
S × C	1	12.50		9.75	
S × T	1	1.68		38.28	5.21*
C × T	1	55.12	5.80*	17.50	2.38
A × S × C	2	78.64	1.43	8.85	
A × S × T	2	1.67		8.17	1.11
A × C × T	2	4.20		7.10	
S × C × T	2	4.50		13.78	1.88
A × S × C × T	2	11.45	1.20	3.79	
Error (1)	132	54.84		28.57	
Error (2)	132	9.50		7.35	

\*  $p < .05$ .

\*\*  $p < .01$ .

A comparison of the relative effects of the aptitude factor on the two dependent variables and a similar comparison of the communications factor on the two dependent variables revealed significant differences in both cases. The aptitude  $F$  is 10.11 ( $p < .01$  with 2 and 396  $df$ ) and the communications  $F$  is 6.89 ( $p < .01$  with 396  $df$ ).

#### DISCUSSION

Responses to the question about the frequency of smoking supports the assumption that the  $Ss$  were nonsmokers, and the analyses of variance of the emotional ratings indicate that the communications differ in level of fear-arousal. The fact that there were significant differences in the initial levels of opinion about the effect of smoking upon health but not in opinion about future smoking behavior limits the generality of our change score results with regard to the former but not the latter.

The communications differed as predicted in producing changed opinion about future smoking behavior but not about effect of smoking upon health. Furthermore, the difference between communications was significantly greater for the former opinion than for the latter. While these

differences were not initially anticipated they are consistent with an elaboration of our initial hypothesis. This hypothesis stated, in part, that defensive, nonacceptance reactions to fear-arousing, persuasive communications do not tend to occur in avoidance situations. But if, in avoidance situations, defensive reactions do not reduce fear, how does fear-reduction occur? An obvious answer is that fear-reduction occurs through avoidance. What our Ss specifically had to avoid was smoking, and it is only with regard to opinion change about future smoking behavior that significant differences between the high and low fear-arousing communications occurred. Thus nondefensive fear-reduction could occur through opinion change about future smoking behavior but not through opinion change about effect of smoking upon health.

The analyses of variance revealed that over time there was decreasing change in opinion about effect of smoking upon health for all Ss, and progressively less difference in opinion about future smoking behavior between Ss exposed to the high and low fear-arousing communications. The latter effect was produced by decreasing change in the Ss exposed to the high fear-arousing communication and increasing change in the Ss exposed to the low fear-arousing communication. The backsliding or decay in amount of change that occurred in all Ss with regard to opinion about effect of smoking upon health and in the high fear-arousal Ss with regard to opinion about future smoking behavior is understandable as being a function of progressive forgetting for the communicated material (Watts and McGuire, 1964). Why, however, should there be increasing change in opinion with regard to future smoking for the Ss exposed to the low fear-arousing communication? We have two possible explanations for such an effect. One of these explanations is that over the week interval the Ss exposed to the low fear-arousing communication had time to draw implications from the communicated material about future smoking behavior. Such inferences were made more quickly by the Ss exposed to the high fear-arousing communication because of fear motivation evoked during the communication session. This explanation, however, suffers from the fact that aptitude level, presumably an index of inference-drawing ability, had no effect upon the increasing opinion change in the Ss exposed to the low fear-arousing communication.

The other explanation is that the increasing change phenomenon is due to interaction between the Ss exposed to the low fear-arousing communication and the Ss exposed to the high fear-arousing communication. If such interaction resulted in discussion of either the experimental manipulations or of opinions about smoking then understandably the differences between the fear-arousal conditions would decrease. Unfortunately, the experimental setting did not allow for the segregation of Ss

over time. Why, however, did the differences between high and low fear-arousing conditions decrease with regard to opinion about future smoking behavior but not with regard to opinion about effect of smoking upon health? The answer is related to the fact that the difference between fear conditions in *initial* change with regard to opinion about effect of smoking on health is not significant ( $F = 1.67$ , with 132 *df*). If there were small initial differences it is understandable why these differences did not decrease significantly over time. As a matter of fact the differences did decrease, although not significantly so; the  $F$  for the communications  $\times$  time interaction is 2.38 ( $p < .10$ ).

Unfortunately, neither of these two explanations has the virtue of explaining why it is that decreasing change in opinion about effect of smoking upon health should be more marked for females than for males. Perhaps this is just a manifestation of female fickleness, a hypothesis more palatable to the first two authors than the third.

The remaining unexpected effect is the aptitude difference in opinion change about future smoking behavior. The low-aptitude Ss, regardless of communication condition, were less influenced than the higher-aptitude groups. Furthermore, the aptitude difference was significantly greater for opinion about future smoking behavior than for opinion about effect of smoking on health. During the presentation of the communications the low-aptitude Ss appeared less attentive than the other Ss, particularly to the verbal material. This being the case it is plausible that they would be less likely to draw inferences from this material concerning whether they would, for example, accept a cigarette from their best friend. This could be the case even though they attended to the communications enough to be persuaded that smoking is detrimental to health. The fact that there were no aptitude differences with regard to opinion change about effect of smoking upon health is in agreement with the findings of Hovland, Lumsdaine, and Sheffield (1949) and of Janis and Field (1958).

What general conclusion about the effect of fear-arousing communication upon smoking behavior can be drawn from this study? First, it should be recognized that our main dependent variable was opinion about smoking behavior and not actual smoking behavior. While opinion may be a determiner of behavior it is certainly not the only determiner. Second, our communicator was undoubtedly regarded as an authoritative source on such scientific matters as the effect of smoking upon health. Fear-arousing communications coming from non-authoritative sources may arouse defensive resistance even in nonsmokers. Third, our data with regard to the persistence of the differential persuasive impact of high and low fear-arousing communications are fairly ambiguous as to

their significance. Fourth and finally, our *S* population did not include a sample of smokers. With all of these qualifications in mind, it can be concluded that among nonsmoking adolescents high fear-arousing communications originating from authoritative sources are initially more effective than low fear-arousing communications in producing opinion change about future smoking behavior. A further study is called for in which differentially fear-arousing communications are presented to smokers and non-smokers who are not allowed to interact over time.

In order to test even more thoroughly our hypothesis of the difference between *Ss* in avoidance and punishment situations as affected by high and low fear-arousing communications, behaviors other than smoking ought to be investigated. One possibility is the violation of speed laws by drivers and prospective drivers. Another is the use of narcotics by actual and potential addicts. Any such studies should attempt to measure and compare fear-levels in the avoidance and punishment conditions. It is theoretically possible that whatever opinion change differences there are between avoidance and punishment conditions are mediated by differences in amount of fear as well as or instead of differences in type of fear-reducing reaction.

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