THE IMMEDIATE AND DELAYED EFFECTS OF FEAR APPEALS ON ATTITUDES TOWARD COMMUNITY FALLOUT SHELTERS

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Ralph Wahrman

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By

Ralph Wahrman

AN ABSTRACT OF A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
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ABSTRACT

THE IMMEDIATE AND DELAYED EFFECTS OF
FEAR APPEALS ON ATTITUDES TOWARD
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This study examined the immediate and delayed effects of high fear and low fear messages on attitude change.

Ninety-six subjects were exposed to tape recordings created to induce low fear or high fear on the topic of the utility of community fallout shelters as a defense against radioactive fallout.

Subjects were exposed to one of four kinds of message situation: a) a single low fear message; b) a single high fear message; c) a series of high fear messages; d) a series of low fear messages.

The study examined two types of message effect, attitude change in the direction of the recommendations, and resistance to the recommendations.

The following effects were hypothesized: (1) When measured immediately after the message a low fear message will affect greater attitude change than a high fear message; (2) When measured several weeks after the message a high fear message will affect greater attitude change than a low fear message; (3) When measured immediately after the message a series of high fear messages will affect greater attitude change than a series of low fear messages; (4)When measured several weeks after the message a series of high fear messages will affect greater attitude change than a series of low fear messages.

An attempt was made to discover some of the methods used by subjects who did not change their attitudes in the direction of the message to resist the message. Several items were presented to the subjects. These items asked subjects to indicate the extent to which they felt the speaker was biased, the extent to which the speaker was expert, the extent to which the message was securely based on facts, the personal relevance of the message and the position of the topic on their personal list of topics. It was anticipated that subjects who resisted attitude change would offer one or more of the above items to justify resistance.

The pretest, immediate posttest and delayed posttest scores of the subjects on an eight item attitude scale were statistically analyzed by means of an analysis of variance. The measures of resistance were analyzed statistically by means of chi-square tests as were the three items utilized to indicate discomfort induced by the messages. The discomfort items were used to discover whether or not the fear induction was successful.

The results of the analyses of discomfort data and attitude data indicated that the messages had not induced the differential amounts of discomfort predicted nor had they induced the differential amounts of attitude change hypothesized as a result of discomfort.

The results of the analysis of resistance measures indicated that subjects who did not change their attitudes in the direction of the recommendations tended to perceive the message as not being securely based on facts. Unchanged subjects who indicated that the message was not personally relevant also indicated that the topic of the message was low on their personal lists of worries. Finally, subjects who indicated

that they perceived the source as inexpert, also indicated that they perceived the predictions in the message as not securely based on fact.

On the basis of these findings, it was concluded that resistance to attitude change was strong, that the major means of resistance was casting aspersions on the validity of the recommendations, and that for many subjects, including those who changed their attitudes, several modes of resistance were utilized simultaneously.

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CHAPTER I

Several experiments have been reported in which an attempt is made to study the effects of messages which threaten the audience with unpleasant consequences unless the communicator's recommendations are carried out.

The present study examines the immediate and delayed effects of threatening messages when they are presented singly and in series. The literature relevant to the present study comes from four areas: a) the literature on "fear appeals," b) the literature on "sleeper," or delayed effects of communications, c) the literature on the effects of a number of messages, d) the literature on resistance to dissonance producing communications.

Fear Appeals

Although relevant studies will be discussed in more detail later, certain things characterize all of the experimental studies. In no case was it found that the more frightening message was the more effective, although in some cases it was equally effective. In all of the studies, the experimenter asked the general question "which is better...?" and in none was there an explicit attempt to describe responses other than "acceptance" or "rejection" of the message. In other words, if the subject "rejected" the message, none of these studies mentioned whether the nature of "rejection" was inattention, distortion of the message, discrediting the source, etc. In all of the studies the effect of a

single message was studied.

The prototype experiment was carried out by Janis and Feshbach (1953). In that study an attempt was made to persuade high school students to change their dental hygiene beliefs and practices about tooth care with messages designed to elicit varying degrees of anxiety. It was found in that study that the "low fear" message achieved the desired effect better than the "high fear" message and that those who heard the "low fear" message were more resistant to counter-propaganda than those who heard the "high fear."

Janis and Feshbach presented their subjects with messages designed to elicit "strong", "moderate" or "minimal fear." The "strong fear" message contained an appeal "emphasizing the painful consequences of tooth decay, diseased gums, and other dangers that can result from improper dental hygiene." The message contained personal threat references explicitly directed to the audience. Slides were used to illustrate the lecture. These included a series of eleven "highly realistic photographs which vividly portrayed tooth decay and mouth infections."

In contrast, for the "minimal" fear message most of the fear arousing material was replaced by relatively neutral information dealing with the growth and functions of the teeth. The "limited discussion of unfavorable consequences" also used a purely factual style. Janis and Feshbach substituted X-ray pictures, diagrams of cavities, and photographs of completely healthy teeth for the photographs of oral pathology.

The writers do not explain whether their findings are attributable to characteristics of the slides, the personalized references, the lecture on oral pathology or an interaction of these factors.

The findings of this study were that the "minimal" fear subjects reported significantly more conformity to the recommendations in the message (involving tooth brushing techniques), more resistance to a counter-message given a week later. The counter-message suggested that the toothbrush one used was irrelevant to good dental hygiene, whereas according to Janis and Feshbach, "the importance of using the proper kind of toothbrush was the theme that was most heavily emphasized throughout the entire (experimental) communication." As noted above, the "strong fear" group accepted the counter-message to a significantly greater degree than did the "minimal fear" group.

Janis and Feshbach (1954) report additional analyses of the data from the 1953 study. The subjects, which included persons who were not analyzed in the previous study, were divided into two categories of "high anxiety" and "low anxiety" on the basis of self reports of manifestations of chronic anxiety in everyday life. The difference between strong and minimal fear groups was based upon differential acceptance by the "high anxiety" subjects, i.e., the "low anxiety" subjects were apparently not persuaded by either the "strong" or "minimal" fear messages. On the measure which is directly relevant to the present study, resistance to counter-messages, the "strong" and "minimal" fear groups did not differ.

Although their 1953 analysis indicated that the "strong fear" message made the audience significantly more anxious than the "minimal fear" message, the 1954 analysis indicated that the messages did not differ in the amount of anxiety elicited.

Berkowitz and Cottingham (1960) examined the effects of high and low fear on attitudes toward the utility of automobile safety belts. The independent variables were "minimal" and "strong" fear arousal. The independent variable was degree of fear arousal, "minimal" or "strong." A second independent variable was the relevance of the message to the subjects (based on how often the subjects drove or were passengers in an automobile). The "minimal" fear message consisted of a 370 word introduction which was common to both lectures. It contained a 350 word emotionally neutral argument elaborating the advantages of automobile safety belts and relying mainly upon statistical data together with one "cartoonlike" slide. In the "strong fear" condition, the subjects heard the common introduction and a 510 word talk which was "more personal and dramatic, and made use of ten slides, most of which depicted gruesome car accidents."

The writers do not explain whether the effects they predicted for the two messages would come from the additional 260 words of text, the characteristics of the extra text, the ten slides or an interaction of these factors. The present study will utilize messages of approximately the same length and will utilize only one medium.

Berkowitz and Cottingham found that the "minimal" fear groups were not changed more than the amount expected by chance for both "high relevant" and "low relevant" subjects. The "strong" fear group for which the message was highly relevant did not change either. The only subjects to change their attitudes in the direction suggested in the message were the "low relevant" subjects in the "strong" fear condition. The implication which can be drawn from this study is that only those least likely to be able to implement an attitude change are receptive to "strong fear" arousing messages. That is, only those who

had no car and who were seldom passengers in other people's cars were persuaded of the utility of safety belts. "Minimal" fear messages, on the basis of the Berkowitz and Cottingham study, would seem to influence no one.

Janis and Terwilliger (1962) used as independent variables "high threat" and "low threat" messages on the relationship between smoking and cancer. The dependent variables were the degree to which the subject showed resistance to the messages during presentation and amount of attitude change in each treatment group toward the main idea of the message (that smoking may be harmful).

Each message contained the same fifteen paragraphs about the link between smoking and cancer. The high threat subjects also read an additional seven paragraphs which:

> "said nothing about smoking but elaborated on the statements about the seriousness of lung cancer. Although objective in tone they emphasized the painful symptoms, the body damage, and the fatalities caused by lung cancer, conveying a much more detailed picture of the dire consequences of the disease."

The findings of this study were that the high threat subjects made more spontaneous statements while reading the messages which were indicative of "discomfort" than did the low threat subjects, indicating resistance to the messages. The "high" and "low" threat subjects did not differ in the amount of change in attitudes. The implication is that there is no advantage to be gained by inducing a strong fright in the audience.

Haefner (1956) varied the degree to which he induced fear in his audience. His major finding was that his "low fear" subjects changed significantly more than his "high fear" subjects in the direction suggested by his message as measured immediately after the message.

The message urged banning of hydrogen bomb tests with inspection by an international agency. The attitude measure was a single statement asking the subjects to indicate agreement or disagreement with a proposal to end hydrogen bomb tests with inspection by an international agency.

A comparison of the two groups with the control group two weeks after the message indicated that the "high fear" group differed significantly (at the .05 level), but the "low fear" group did not. This may be considered a test for a "sleeper effect" (a delayed shift in attitude). Insofar as the differences in retention of the change is so slight ($p < .06$ for the low fear group), there is a need indicated for an examination of the retention of change over a longer period of time than two weeks.

A second measure of attitude change in the Haefner study was an item suggesting ending hydrogen bomb testing (with no mention made in this second item of an international inspection agency). On this second item Haefner found that on his initial measure there was no difference between the significant amounts of change shown by his "low fear" and "high fear" groups of subjects, but after two weeks the "high fear" group still differed from the control group while the "low fear" group did not. This is not reported as a major finding because Haefner considered the second measure a less valid indicator of the effect of his message.

Haefner also divided his subjects into "low anxiety" and "high anxiety" subjects using the same instrument as Janis and Feshbach (1954). He found no significant differences between the responses of these two groups.

Theoretical Background of the Present Study

The finding that strong fear appeals are less persuasive or no more persuasive than mild fear appeals has been interpreted by later writers with only minor variations much as Janis and Feshbach (1953, 1954) interpreted it. They suggested that the strong fear appeal aroused more tension than the recommendations were able to reduce to a tolerable level. Therefore the audience became motivated to ignore or minimize the importance of the threat. The low fear message did not arouse as much tension and therefore the same recommendations were able to reduce this lesser amount of tension and were acceptable. An alternate, though not completely contradictory explanation will be proposed later.

Sleeper (Delayed) Effects

The literature on "sleeper effects" (cf. Kelman and Hovland, 1953; Hovland and Weiss, 1951; Hovland, Lumsdaine, and Sheffield, 1949; Catton, 1960; Peterson and Thurstone, 1933; Holaday and Stoddard, 1933) suggest that by examining the effects of a message an hour or a week afterwards we may be looking for effects prematurely. That is to say, an apparently ineffective message might prove effective if we were to let it settle for a few weeks. Or, given no further exposure to relevant stimuli, an apparently changed attitude may regress to its original level. If such effects should occur, we may find that "high fear" messages, rather than being either less effective or no more effective than "low fear" messages, may prove more enduring over time.

Haefner's (1956) finding that on one of his delayed measures the initially more persuaded low fear group did not retain their change as well as the high fear group, while on a second delayed measure, from an initially equal amount of change the high fear group differed significantly from the control group and the "low fear" group had apparently regressed to their initial attitude, supports such a conjecture. It also suggests a need to specifically test for such delayed effects over a longer period of time than two weeks.

A potentially significant variable involved in "high fear" messages is the higher interest value of the more frightening message as found by Berkowitz and Cottingham (1960), Janis and Feshbach (1953) and Haefner (1956). It has been suggested that over time, low credible sources are dissociated from the contents of their messages (if the messages are otherwise acceptable) so that the arguments themselves are the source of attitude changes. It is possible that in the same way, the subject may, over time dissociate the discomfort surrounding the "high fear" appeals from the interesting content so that the merits of the recommendations can be judged more clearly. The assumption is made here, that if not inhibited by the discomfort the message would be found worthy of immediate acceptance.

The Haefner findings of somewhat greater retention of change in the "high fear" group may be attributable to the discomfort aroused as well as the interest. That is, rather than forgetting the discomfort and recalling the message, the subjects may retain the message because of its interest, recall the discomfort and their unsuccessful attempts to relieve the tension through rejection of the message, and decide to

accept the recommendations. This would more completely reduce the discomfort.

A practical application of such a finding would be that insofar as a message outside the laboratory is in competition with other messages for the receiver's attention, the shock value of a "high fear" message may prove to be more of an aid to acceptance than the initial discomfort it arouses will be a hindrance.

In summary of the preceding paragraphs, over time a high fear message partly because of its interest value and to a larger extent because of the discomfort it creates, may prove to be more effective at changing attitudes than "low fear" messages.

The immediate effects of "high fear" and "low fear" messages are likely to be as follows as indicated by past studies. The "low fear" message will be more effective or no less effective than the "high fear" message at changing attitudes in the direction recommended by the source.

Number of Messages

It was noted earlier that our knowledge of the effects of "fear appeals" is based on studies in which the audience received a single message and were examined very soon after the message situation. Klapper (1960) points out that it is rare for a single message to "convert" or completely change a receiver although it may weaken or intensify an attitude. The present study will examine the effects of more than one message. It is characteristic of messages outside the laboratory that they do not come singly, but rather as parts of campaigns. That is to say, other messages follow and, as Klapper points

out, changes in strongly held attitudes are rarely attributable to a single message. A study of the cumulative effects of "high fear" and "low fear" messages may indicate that the responses to each type are different than the studies cited above would lead one to expect.

By examining the effects of only one message we may be making several kinds of errors. That is to say, if we wish to make strong changes in an attitude with a single message, we would require either a powerful message or a very weak attitude.

It is characteristic of messages outside the laboratory that they are part of campaigns. These campaigns are more likely to be more effective than single messages. Examining the effects of a series of messages in the laboratory would make it possible to analyze the way attitudes are weakened or intensified as messages increase. It would also allow a better approximation of the circumstances under which attitude change takes place outside the laboratory and make it possible to examine another aspect of the effects of "fear appeals."

Previous experiments on the effects of fear appeals can not be said to have examined highly controversial topics. Few people are against good dental hygiene, few believe that smoking is good for one's health, few people consider automobile safety as undesirable, few are opposed to the idea of ending nuclear tests (although there is disagreement on the conditions which should precede such a ban). The topic used in the present study will be more controversial than previous topics used in "fear appeal" experiments, i.e., the utility of fallout shelters.

Insofar as feelings on this issue are likely to be strong and not likely to be changed significantly by a single message, an additional

reason is suggested for examining the effects of a series of messages.

Before making predictions as to what the results of such a series of messages would be, it is necessary to return to a discussion of theoretical reasons for the effects of "fear appeals."

Resistance of Attitude Change

Several writers such as Lewin (1947), French (1944), Fearing (1953), Kelley (1957) and Festinger (1957) have suggested that behavior change (or attitude change) is only one response to a discomforting situation. Among the other possible responses to a discomforting communication (persuasion) situation are dissociation of the source from the message, evasion of the message, distortion of the message. These responses as well as "boomerang" effects have the common characteristics of being rejections of the message. The "high fear" situation is apparently often one of these rejection situations.

As described, for example, by Janis and Feshbach (1953, 1954) and Hovland, Janis and Kelley (1953), the high "anxiety" produced by their "high fear" message on the consequences of improper tooth care raised their listeners' discomfort beyond the point where it could be satisfactorily reduced by the recommendations and the result was high resistance to and rejection of the entire message. Something about the "low fear" message did not produce as much resistance to the message and the recommendations were accepted.

As Lewin (1947) noted, given a situation in which there are unavoidable forces of resistance encountered, one strategy for overcoming these forces of resistance is an increase in the amount of pressure for change, the other strategy is the removal of resisting forces.

In the situation described by Janis and Feshbach (1953), the

attempt to increase the forces toward change by increasing the amount and proportion of threatening materials is an example of the increase of pressure strategy. The "low fear" message had a minimum of threatening materials and was largely devoted to emphasis on the recommendations for overcoming the threat. This can be considered an example of the second strategy, the removal of resistance. Lewin considered the increase of pressure as a less effective way to cause change than the removal of resistance, though in many cases increasing pressure does achieve the change. That is to say, even the less effective "high fear" message in the fear appeals studies persuaded many subjects.

Festinger's (1957) dissonance theory is an extension and expansion of Lewin's ideas on "forces" and "resistance." In his terms, the cognition that one is performing a certain behavior regularly and the cognition that a presumably credible source is saying that this behavior is dangerous are in a dissonant relationship and create in the listener a state which is uncomfortable and leads to pressures to reduce the discomfort and dissonance. (Festinger describes both the relationship between cognitive elements and internal states of individuals [Festinger and Bramel (1962)] with the term dissonant.)

This theoretical approach offers an explanation for the differential effects of "high fear" and "low fear" appeals which does not contradict the "defensive avoidance" explanation of Hovland, Janis and Kelley (1953) as much as it extends and clarifies it. Hovland, Janis and Kelley had suggested that high fear messages may arouse more anxiety than the recommendations in the message could relieve and that therefore it was easier for the subjects to escape from the anxiety-producing cues

by avoiding, rejecting or ignoring the message. Janis and Feshbach (1954) do not suggest that no anxiety at all is desirable, rather that, if a relatively low anxiety drive is aroused, and the recommendations are reassuring, the subjects will be more likely to conform to the recommendations.

In Festinger's (1957) terms, a slight amount of dissonance will enhance the probability of the message's acceptance while a high degree of dissonance will enhance the probability of such other responses as distortions, inattentiveness, efforts to deny or minimize the threat, responses other than conformity to the recommendations.

One advantage of the Festinger formulation is that "dissonance theory" or "balance theory" supplies a theoretical base and empirical background which the Janis, Feshbach studies and the others were lacking. Their studies were apparently exploratory and do not appear to have been based on deductions from a theory but rather upon the expectation that since people under threat often attempt to deny or ignore the threat, they might find this in their experimental situation too.

An advantage of Festinger's formulation is that it can be utilized to describe message situations other than fear arousing ones. A further advantage of the "balance" approach for purposes of the present study is that effects of messages other than attitude change are also examined separately rather than considered in a single category of "rejection" or "ineffectiveness."

The hypothesis tentatively proposed above was that the initially less effective "high fear" message may over time prove to be more effective. A "dissonance theory" approach would suggest such a finding would be likely. Given a "dissonant" state there are internal

pressures to resolve the discomfort. Although there are, as noted, several ways of reducing the discomfort to a tolerable level, there is, at least logically, only one way to resolve it, viz. acceptance of the message. If the individual should choose to evade the message in any other way he has not necessarily resolved the issue, but may have only postponed the resolution. Where this is so, at a later time the subject may decide that the preliminary response was inadequate and may choose a different response. This might mean attitude change towards or away from the direction suggested in the message.

Evidence that initial responses may be reconsidered is supplied by the discovery of "sleeper effects." One reason why responses would be reconsidered is the interest value of the message. If the high fear message is as interesting as previous studies indicate it is, the subject may be motivated to think about it for a longer period of time than for the low fear message. If the initial response to the high fear message is rejection, the retention and reconsideration of the message may well lead to later acceptance. The low fear message, insofar as it is less interesting, may lack one characteristic which would lead to future retention or reconsideration of the initial response.

For the "low fear" situation, it is proposed that the following occurs. The message arouses in many a state of mild discomfort or dissonance. The recommendations present a clear way to reduce the discomfort, i.e., acceptance of the recommendations. The process is not, of course as simple as the last few lines would seem to indicate, probably depending upon the logic of the recommendations, how well they seem to solve the problems presented, the interest value of the topic,

dissonance thresholds of the individual and other variables.

Over time, if the subject has shifted his attitude in the direction of the recommendations, if the message was not particularly interesting or particularly frightening or dissonance producing, it may be easy to forget the whole affair. The reason why it would be easier to ignore a change produced in a mildly dissonant situation than a change produced by a highly dissonant situation lies in the amount of committment engendered. That is to say, a change produced under a large amount of pressure may require a good deal of pressure or time before it is "forgotten;" a change produced under a lesser amount of pressure may require less pressure and/or time before it is "forgotten."

For this reason it is predicted that those changes engendered in the "high fear" situation will be better retained than changes engendered by the "low fear" situation.

The effect of a series of "high fear" messages is likely to be an increase of discomfort on the part of the listeners. As suggested above, one may persuade by removing resistance or by using increased pressure. The effect of a series of "high fear" messages is likely to be an increase in the discomfort of the audience. If there is internal pressure to resolve the discomfort of a single message, the discomfort of several messages is likely to create even more pressure toward change. If the subject has resisted previous pressure to resolve dissonance, he may find it more comfortable to accept the message than to continue resistance.

The subjects who have received "low fear" messages and resisted the slight amount of dissonance produced may find themselves equally well able to resist continued mild dissonance. The resistance to the

first "low fear" message may act, in other words, as an inoculation. McGuire and Papageorgis (1961) and Papageorgis and McGuire (1961) found building resistance to a weak message on the part of the subjects led to effective resistance to later and stronger messages. The subjects resisting "low fear" messages may similarly inoculate themselves against later ones.

Discomfort from anxiety and dissonance may be considered to be a continuous variable. The various studies on fear appeals may be summarized in terms of such a continuum. If very little or no discomfort is aroused, the message is likely to be ignored. If a moderate amount of discomfort is aroused many people will change their attitudes in the direction suggested by the message. As the discomfort aroused increases, the likelihood of acceptance of the message begins to diminish and the likelihood of the individual's trying some other response increases.

The theoretical ideas noted above indicate that if the discomfort is increased sufficiently the likelihood of acceptance will increase again. This was also noted by Hovland, Janis and Kelley (1953, 83):

> "In general, the available evidence indicates that as the degree of emotional tension in the audience is increased there is not a corresponding increase in acceptance of the communicator's reassuring recommendations. It seems likely that for many types of persuasive communications the relationship will prove to be curvilinear one, such that as emotional tension increases from zero to some moderate level acceptance tends to increase, but as emotional tension mounts to higher levels acceptance tends to decrease..ascending acceptance in the lower end of the curve might account for some of the findings on the superiority of 'emotional' appeals..[by Hartmann, (1936) and Menefee and Granneberg, (1940)]"

It is suggested here that in previous studies, the very high end

of the continuum has not been studied and that what has been referred to as "high fear" has actually been closer to the middle part of the continuum. It is not possible to be certain about this conjecture for several reasons. 1) There are no standard units for measuring the amount of discomfort aroused in the subjects and the various experimenters have used measures which are not comparable across studies. 2) Presenting messages which are titled "low fear" and "high fear" has not been shown to differentially elicit "low fear" and "high fear" in the subjects in several studies [(Janis and Feshbach, 1954); attempted replications of the Janis and Feshbach studies by Goldstein, 1959; Moltz and Thistlethwaite, 1956)]. 3) Practical limitations in almost any laboratory situation make it unlikely that an experimenter will actually be able to present a single message which completely terrorizes the audience.

If the audience is aroused by the message it may be difficult to arouse them past a given point at one time. That is to say, after a certain point the audience may start to "tune out" the message so that it may prove more effective to arouse some tension at one time and renew and extend the discomfort with a second or third message than to try it all at once. In other words two five minute messages may arouse more discomfort than one ten minute one. In this way it may be possible to increase discomfort to a point near the "high discomfort" end of the continuum, and enable the test of the hypothesis that extreme discomfort may also produce the effects desired by the message creator.

One reason why it is suggested to try to maximize pressure toward change rather than attempting the apparently simpler approach of mildly discomforting the audience concerns the topic itself. In other

words, some topics are not fear producing in themselves and can be discussed without necessarily arousing strong feelings although the communicator may try to treat the topic in such a way. On the other hand, there are topics which need little help from a communicator to be tension producing, such as the topics of death, cancer, tuberculosis, mental illness. The mere mention of topics like these may have enough "built in" tension so that it is difficult to keep the audience from arousing themselves. In such a case it may be easier to increase the tension than to try to lower or eliminate it or to try to convince the audience that it is not as dangerous as they think.

For many students of communication - no less so for those who have studied "fear appeals" - responses to message fall into one of two categories - "effect" or "no effect." That is to say, if the message does not have the effect desired, it is considered as having no effect. It is more realistic to consider every message as having an effect, regardless of whether or not it is the desired one. Evasion of the message, distortion, and even ignoring the message are responses, and the task of the researcher should be to discover what kinds of messages have what kinds of effects. As Kelley (1957) points out, studies of attitude change generally focus on either attitude change as a measure of resistance to the message or one of the "evasion" measures as indicators of resistance, but rarely if ever on both. Kelley and Woodruff (1957) is perhaps the only such study.

Osgood (1960), following Festinger (1957) categorizes the modes of resistance as falling into four general categories. Given a dissonant cognition about one's behavior or attitudes, e.g. that one smokes and

that smoking may be dangerous, 1) a person may change his behavior or attitudes so as to be consistent with his cognitions (give up smoking, take up filter cigarettes), 2) he may change his cognitions so as to be consistent with his behavior (he may question the validity of the information), 3) he may add new supporting elements so as to reduce the total dissonance (seek information on how much more likely one is to die in automobile accidents), or 4) he may eliminate old dissonant elements to reduce the total dissonance (avoid reading or thinking about it, or just live with it) (Osgood, 1960, 355).

The range of alternatives which would fit into any of the above basic categories is limited only by the individual subject's imagination. The problem of which of the four categories of response will be chosen, on the other hand, may be more amenable to empirical study.

It is not, at present, known what the circumstances are surrounding a given choice of mode of dissonance reduction. A study by Kelley and Woodruff (1957) suggests that if the message is "evaded" only one method will be used by a given subject and suggests that to a large, though unknown extent, the method chosen will depend on characteristics of the particular message - e.g. if the message is ambiguous the subject may find it easier to distort it. Miller and Swanson (1960), on the other hand, suggest that the "defense mechanisms" of the psychoanalytic literature, which according to Festinger and Bramel (1962) overlap with dissonance theory's "modes of dissonance reduction," are to a much larger extent based on personal characteristics of the individual receiver - such as past success with a given technique, or the social class of the individual-than they are on characteristics of the message.

Whether it is a case of one being more important than the other or, more likely, an interaction of the two classes of factors, the fact remains that we know little or nothing about why one response or another will be given to the message, as Festinger (1957, 270-271) points out. One of the purposes of this study is to examine not only whether or not the subject changes his attitude toward the topic in the direction recommended, but also how the subjects who resist the message do so.

Hypotheses

The study is designed to test the effects of messages designed to frighten subjects into changing their attitudes (High Fear) and messages designed to change these same attitudes with a minimum or lack of threat to the subjects (Low Fear).

Hypothesis 1. The Low Fear message will be initially more persuasive than the High Fear message. The High Fear message will create a good deal of tension and resistance to attitude change. The Low fear message will create less tension and less resistance to attitude change.

Hypothesis 2. The High Fear message will be more persuasive over time than the Low Fear message. The Low Fear message will be forgotten. The High Fear message and its attendant interest and discomfort will create enough internal pressure toward change to persuade some who had previously resisted change; those who had initially changed will retain the changes.

Hypothesis 3. The High Fear series will be initially more persuasive than the Low Fear series. The High Fear series will create enough tension to overcome resistance to change. The Low Fear series will produce less change than the High Fear series.

Hypothesis 4. The High Fear series will be more persuasive over time than the Low Fear series. The Low Fear series will be forgotten. The High Fear subjects who changed will retain the changes.

CHAPTER II

The present study examines the immediate and delayed effects of fear appeals on attitudes toward civil defense. The college students who served as subjects were exposed to one of four types of message situation: a) one low fear message, b) a series of low fear messages, c) one high fear message, d) a series of high fear messages.

The sample

The initial sample consisted of 212 subjects, students in an introductory communication course and in a business writing course. The sample was composed of approximately equal numbers of freshmen, sophomores, juniors and seniors and approximately equal numbers of male and female students. Visits by the experimenter were unannounced and allowed no control over the number of subjects present at a given session. Subjects who were absent from any of the experimental sessions had to be dropped from the analysis. Absence of subjects and, in one case, the absence of an instructor and the subsequent cancellation of his class, resulted in the loss of 79 subjects and a stratified random procedure in the interests of equalizing the sizes of treatment groups resulted in the elimination of 22 more subjects from the analysis. The final sample of subjects consisted of 111 subjects -24 in each treatment group and 15 in the control group - whereas the initial sample had consisted of 212 subjects -49 in each of the four treatment groups and 16 in the control group.

The experimental design

The experiment was designed to test hypotheses about the immediate and delayed effects of high and low fear messages on attitudes toward a subject (in this case, the utility of community fallout shelters). One hypothesis dealt with the effects of a series of messages. The "series" was operationalized as a single message which was repeated twice.

Only one message was written for each category because it was decided on the basis of past difficulty in efforts to create "high" and "low" fear eliciting messages (cf. Moltz and Thistlethwaite, 1957; Goldstein, 1959; Janis and Feshbach, 1954) that a series of truly equivalent high fear and low fear messages would be difficult if not impossible to construct. (The two messages are contained in Appendix A).

This was considered as advantageous in approximating a mass media campaign in which the audience may well be exposed to the same message several times.

Another reason for using only two messages to approximate a series of messages was administrative. The sessions were held during regular meeting hours of the classes. In the interests of avoiding excess strain in the relationships between experimenter, instructors and subjects which might be reflected in subject responses to the experiment, and because of limitations of time due to the fact that the classes had only nine meetings during the quarter, it was found necessary to accept two messages as approximating a series.

The experiment was designed also to test delayed as well as immediate effects of the messages. "Immediate" was operationalized as a week after the last message given each group, "delayed" was operationalized as three weeks after the immediate test. The delayed measure was given three weeks after the immediate test for administrative

reasons in part (since the experiment had to be completed during the single quarter), and mainly because the longest previous reported test of long range effects of fear appeals had used a two week lapse from message to delayed measure. It was felt that a four week lapse would be long enough to demonstrate the effects hypothesized. The design is charted in Diagram A below.

Diagram A *

	Low Fear I	Low Fear II	High Fear I	High Fear II	Control
1st week	Pre-test	Pre-test	Pre-test	Pre-test	Pre-test
2nd week	Low	Low	High	High	No Message
3rd week	Post-test I	Low	Post-test I	High	Post-test I
4th week	No Message	Post-test I	No Message	Post-test I	No Message
5th week	No Message	No Message	No Message	No Message	No Message
6th week	No Message	No Message	No Message	No Message	No Message
7th week	Post-test II	No Message	Post-test II	No Message	No Message
8th week		Post-test II		Post-test II	Post-test II

*The immediate test is represented as Post-test I, the delayed test is represented as Post-test II

A control group was utilized as an indicator of possible effects of the questionnaire itself. This was found necessary in light of the finding of Berkowitz and Cottingham (1960) that their control group showed a large change in attitude although they had received no messages on the topic in question, which the writers attributed to stimulation to think about the topic resulting from the questionnaire.

The control group was examined three times. They were examined for the pre-test. They were examined two weeks later when the one message groups were given their first post-test, and again when the two message groups received their delayed post-test.

The experimental topic

The topic which the messages dealt with was the utility of community fallout shelters as protection from radioactive fallout in the event of a nuclear war. The reasons for choice of this topic were several. It was chosen because it allowed for elaboration in a manner which could be frightening, because it represented a controversial topic - there is some question in the minds of many people as to the utility of shelters (cf. Berlo, 1962) - and more importantly, even the goal of the shelter program is somewhat controversial. That is, unlike the goal of good teeth or highway safety, with which no one disagrees, there are many who feel that if their families, friends, communities or country are destroyed, they don't wish to be saved. It was felt that these controversial aspects of the topic would make it difficult to reject the null hypothesis of no difference between the High and Low fear messages if there were none.

The Messages

The two messages were constructed with the informal content analyses of Janis and Feshbach (1953) and Moltz and Thistlethwaite (1959) in mind since these were the only "fear appeal" studies which described in detail how their messages were constructed. The material expected to be differentially frightening was distributed as noted in Chart A below.

Chart A

Description of Content of High and Low Fear Messages

Item	Number of Mentions High	Low
severe illness	3	0
death or fatal injury	6	3
bone cancer	1	0
cancer of the thyroid	1	0
nausea	1	0
lack of appetite	1	0
diarrhea	1	0
vomiting	1	0
prostration	1	0
genetic effects	1	0
ulceration of gums and mouth	1	0
fever	1	0
harm	0	1
radiation sickness	1	1
Total mentions of dangers of radiation	20	5

The messages were each approximately six minutes in length. Both were tape recordings in the format of a radio interview conducted in question and answer style. The reason for this was that transitions from each of the topics the experimenter wanted the subjects to hear could be most easily made in this fashion. The messages were almost identical in content except where the "low fear" or "high fear" materials were inserted. The themes of the message were (a) the dangers of exposure and (b) the safety offered by shelters. The former was varied to produce high and low fear in the subjects, the latter remained practically the same and concerned recommendations for protection. Every effort was made to have the message vary only on theme (a).

The questions were designed to be short enough so that the "interviewer" would not speak long enough to be recognized as the experimenter. The interviewee was presented as being an expert from the non-existent "Nuclear Research Center" and portrayed by Mr. Neil R. Bernstein, a communications graduate student who had considerable acting experience, and was therefore expected to give a convincing performance as an expert.

Miller (1963) notes that the messages in all the reported "fear appeal" studies were classified on a priori grounds rather than by allowing the audience to decide if the messages were differentially fear eliciting. In this study the messages were pre-tested for differential effects on 65 subjects from two different classes, an introductory advertising course and an introductory radio-television course. The subjects were asked to indicate the extent of their agreement or disagreement with the statement, "The message made me anxious about my safety" to be answered on a five point scale ranging from "strongly agree" through "strongly disagree." The results are shown in Table I.

Table I

Pre-test scores on anxiety for High and Low Fear Messages

	High Fear	Low Fear	
High Anxious (Strongly Agree, Agree)	20	1	21
Low Anxious (Don't Know, Disagree, Strongly Disagree)	20	24	44
	40	25	65

$X^2 = 12.856, 1 d.f., p < .001$

The pretest indicated that the two messages significantly differed in the amount of discomfort which they induced in the audience - as admitted to by the audience.

The subjects were also asked to indicate the extent of their agreement or disagreement with the statement "The message was interesting" on a five point scale ranging from Strongly Agree to Strongly Disagree. The results showed no significant difference between the two messages on this indicator (X^2 = .6019,1 d.f.,.50>p>.25). It had been expected on the basis of past studies (Janis and Feshbach, 1953; Berkowitz and Cottingham, 1960; Haefner, 1956) that the Low fear message would be found less interesting. It was decided that revising the message to make it more interesting would change it too much.

The experimental procedure

The experimenter arranged to visit the classes involved in the study and to be introduced as a member of the staff of the Communications Department who would "explain his needs." Each class was asked to fill out the pre-test questionnaire (Appendix B) and instructed,

> "This is a pretest of a survey the department will be running soon. We would like to have you fill it out because it is a pre-test. We will analyze your answers to find out how the questions hold together."

The scores on eight of these items were considered the operational definition of "attitude toward the utility of community fallout shelters." The other items were filler items and were replaced in the post-tests by other items. The experimenter thanked the subjects and left the room without mentioning that he would return.

A week later the experimenter returned and asked the subjects to help him on another "department project." The subjects were told:

> "We would like your help in evaluating a recording. We would like to have you listen to this recording. We will ask you a few questions after it is over about your impressions of the recording."

The recording was then played and the "discomfort" questionnaire was administered (see Appendix C). The experimenter left the room without mentioning that he was going to return at another time.

A week later the experimenter returned to the classrooms. The one message groups were given a post-test. The two message groups were asked to listen to "a recording." The two message groups were asked to listen to the recording they had heard previously with no mention made by the experimenter about their having already heard the recording. They were told:

> "Since we have agreed not to take up more than ten minutes of class time, we will ask you about your responses to the recording at another time."

A week later the experimenter returned with the post test.

The post test was presented to the subjects as a revision of the "survey." The subjects were told:

> "You remember the survey you helped us out with a few weeks ago? We have revised it, changed some questions, dropped some, added some new ones. We would also like to ask you some questions about the other project, the recording you heard." (see Appendix D)

An attempt was made to disguise the purpose of the questionnaires by changing the format of the questionnaires as well as the items. Whereas the pretest had been on dittoed sheets, the post-test was mimeographed with the word "revised" printed in large capital letters on the top of the front page, the filler items were dropped and

replaced by information items borrowed from a study by Berlo (1962). The questions about the recording were on an attached dittoed sheet in an attempt to make them seem unrelated to the other part of the questionnaire.

As had been done for the pre-test and the "discomfort" questionnaire the subjects were asked to put an identifying mark in the space provided on the top of the first page. In the case of the communications subjects, their mothers' maiden name was requested; in the case of the business writing subjects, their student numbers were requested.

Three weeks after the post-test, the experimenter returned to the classes with the second post-test. The subjects were told:

> "We would like your cooperation again on our survey. We have dropped some more questions and we have some others."

The subjects filled out the questionnaire (see Appendix E). The experimenter then told the subjects

> "despite the hint in the last two questions, there will be no more recordings. Thank You."

The measuring instruments

The eight "critical" items in the pre-test (Appendix A) were considered the operationalization of attitudes toward the utility of community shelters. The items were in the form of statements with which the subjects were asked to indicate the extent of their agreement or disagreement with these items on a five point scale. The items were as follows:

1. "Community fallout shelters may not save us but they are the only chance we have to survive."
2. "There is no protection against the long range effects of radioactive fallout."

3. "Everybody should know the location of the nearest community shelter."

4. "Community fallout shelters would not be practical in my community."

5. "Our community officials should begin plans now to provide fallout protection for our entire community."

6. "The drive to build community fallout shelters is merely a money-making scheme."

7. "If we had a nuclear attack, I would go to a community fallout shelter."

8. "The building of community fallout shelters is wrong because it increases the 'war scare'."

The items were scored from 0 to 4 on the basis of how favorable the answer was to the shelter program. The sum of the eight scores was considered the attitude toward shelters which this study was attempting to influence. The source of the items was a study by Troldahl and Powell (1962). The critical items had been found by them to discriminate best of the thirty-odd items in their study between those who were doubtful of the utility of shelters and those of their subjects who thought shelters could be of value.

The post-tests used these same eight items; the filler items were replaced by information items for the first post-test and dropped for the second post-test.

The post test consisted of three types of items: the critical items, information items, and items intended to elicit indications of resistance or "evasion." The information items, five in number, were taken from a study by Berlo (1962). The messages had been constructed so as to give "correct" answers to these questions, that is, the information was placed equally clearly in both messages. The reason

for the information items was that it was desired to test the finding of Janis and Feshbach (1953), Janis and Milholland (1954), Haefner (1956) and Moltz and Thistlethwaite (1959) that differences of response between their "high" fear and "low fear" on attitude items was not attributable to what might be called "motivated inattention," as indicated by recall of the message.

The items taken to be indicative of resistance were in the form of statements to be answered on a seven point scale. The material was presented in this fixed alternative style with full realization of the fact that subjects might choose to resist the message in some manner not included by the alternatives presented, but there was no other feasible way for the experimenter to tap these alternatives given the particular administrative situation. The items used are presented below:

1. "Do you think the presentation of the material was

   BIASED__:__:__:__:__:__:___UNBIASED ?"

2. "Do you consider the speaker (Dr. Barnes)

   EXPERT__:__:__:__:__:__:__INEXPERT ?"

3. "To what extent do you think the predictions made by the speaker have a secure basis in fact?

   SECURE__:__:__:__:__:__:__NOT SECURE "

4. "How applicable do you think the material was to you personally?

   APPLICABLE__:__:__:__:__:__:__NOT APPLICABLE "

5. "In relationship to other things which you can think of that are potential dangers, how high on your 'personal list' of worries is this particular one?

   HIGH__:__:__:__:__:__:__LOW

The subjects were also asked:

"How do you think Dr. Barnes would respond to the following statements?"

The statements which followed were the critical items with the exception of items 4 and 5.

Items 1 and 2 above were intended to elicit manifestations of resistance to the source and his presentation of the material. That is, it was anticipated that some subjects would resist the message by claiming that the source was biased or that the source didn't know what he was taking about. These seemed the most likely ways to invalidate the message.

Item 3 was presented in an attempt to see if subjects were trying to invalidate the message by saying something on the order of: "We've never had a nuclear war, how can anyone know what will occur or what will protect us if war should come?"

Items 4 and 5 were intended to tap resistances which took the form of denial of personal relevance of the material or minimizing the threat. That is, it was anticipated that some subjects might try to add supporting elements to their old cognitions in Osgood's (1960) terms. This type of resistance would take the form of saying "it can't happen to me" (item 4) or something like "I could also get killed crossing the street and that's more likely to happen." (item 5).

The subjects were asked to respond as "Dr. Barnes would have" in an attempt to seek tendencies toward distortion of the message. It was anticipated that some subjects might try to distort the message so that they would perceive the speaker as saying what they themselves believed.

The "discomfort" questionnaire contained four items. The items were phrased as statements with which the subjects were asked to indicate the extent of their agreement or disagreement on a five point scale from "strongly agree" to "strongly disagree". Each was given a score from 0 to 4 with the higher score indicating the effect intended by the experimenter.

The items were

1. "I would say that the presentation of the material was pleasant."
2. "The material was interesting."
3. "The material made me feel anxious about my safety."
4. "The material made me feel anxious about the safety of my family."

It was anticipated that the "high fear" message would be more "interesting" and less "pleasant" than the "low fear" message since Janis and Feshbach (1953) and Berkowitz and Cottingham (1960) had found such responses to their experimental messages.

The second (delayed) post test contained the critical items and several questions relating to the subjects' estimates of the likelihood of a nuclear war.

The subjects were also asked to choose whether, if given another message on the topic of shelters, they would like to hear the side of the controversy they had been exposed to or the other side. This was considered a possible way in which a subject might resist the message. That is, it was anticipated that some subjects might choose to reduce dissonance by seeking information which would reinforce their attitudes. In this case, subjects who had little faith in the utility

of shelters might ask to hear a message which supported such a position. (Festinger, 1957; Adams, 1961)

CHAPTER III

The experiment exposed four groups of 24 subjects each to one of four kinds of message situations, viz. one low fear message, two low fear messages, one high fear message, two high fear messages. The experimental data consisted of five items obtained for each message group: 1) pre-test attitude scores, 2) immediate posttest scores, 3) delayed posttest scores, 4) discomfort data, 5) resistance data.

The Discomfort Data

The hypotheses tested related to the effects of "high fear" and "low fear" messages. The "discomfort" data was intended as an indicator of the motivations and feelings which were the predisposing factors underlying the hypotheses. Specifically, the items were intended to find out how pleasant, how interesting and how anxiety producing the materials were. There were four items used to index these three kinds of response. These were administered after the first message which each group heard. The subjects were asked to indicate the extent of their agreement or disagreement with the following statements on a 7 interval scale:

1. "I would say that the presentation of the material was pleasant."
   AGREE 6:5:4:3:2:1:0 DISAGREE

2. "The material was interesting."
   DISAGREE 0:1:2:3:4:5:6 AGREE

3. "The material made me feel anxious about my safety."
   AGREE 6:5:4:3:2:1:0 DISAGREE

4. "The material made me feel anxious about the safety of my family."
   DISAGREE 0:1:2:3:4:5:6 AGREE

The items were scored as indicated. Items 3 and 4 were combined as a single anxiety score.

The hypotheses considered were:

1. The "high fear" group will have a higher median on the interest item than the "low fear" group.
2. The "low fear" group will have a higher median on the pleasantness item than the "high fear" group.
3. The "high fear" group will have a higher median on the anxiety measures than the "low fear" group.

The data was analyzed by use of the median test and as Table 2 shows, no significant differences were found.

Table 2

Median Scores On Discomfort Indices By Message Group *

	Interesting	Pleasant	Anxiety Producing
High (1 message)	5.89	5.20	6.80
High (2 messages)	5.75	4.67	6.00
Low (1 message)	5.60	4.86	6.20
Low (2 messages)	5.80	5.12	7.00
Overall median	5.78	4.96	6.40

X^2 = .766, 3 df, p .10 interesting; X^2 = 1.48, 3 df, p .10, pleasant; X^2= 3.2, 3 df, p 10 anxiety producing

*The level of statistical significance required in this study was .05, two-alternative, any findings above the .10 level are reported only as p .10.

The analysis of change

Comparisons of the post-test means with the control group means indicated that none of the means differed significantly at less than the .05 level. This indicates that no significant attitude changes took place. (The treatment means are shown in Table 4.)

The analysis of variance reported below must be evaluated in light of this findings.

The scores which each subject obtained on the eight items on the pre-test, the immediate and delayed post-test were analyzed by means of an analysis of variance trend analysis (Edwards, 1960, 133-138). This analysis utilized the three scores for each of the subjects to test the four major hypotheses. The results are indicated in Table 3.

Table 3

Analysis of Variance of the Repeated Attitude Measures

Source:	d.f.	Mean Square	F Value
A: Level of Fear	1	53.39	1.13
B: Number of Messages	1	29.39	.622
AxB interaction	1	544.50	11.52*
Error (a)	2	47.25	
C: Stages	2	28.36	4.6*
A x C	2	10.43	1.72
B x C	2	8.5	1.41
A x B x C	2	25.44	4.20*
Error (b)	184	6.05	
	287		

*p .05

Tables 4 and 5 show respectively the mean scores and the differences between means for each of the message groups and the control group.

Table 4

Attitude Means by Treatment Groups*

	Pre-test	Post-test I	Post-test II
High Fear (one message)	21.67	22.67	23.79
High Fear (two messages)	19.83	20.79	21.17
Low Fear (one message)	19.58	19.29	18.52
Low Fear (two messages)	21.46	22.54	23.46
Control	19.47	19.47	20.20

*Immediate post-test is Post-test I; Delayed Post-test is Post-test II.

Table 5

Mean Difference of Treatment Groups From Pre- to Post-tests

	Difference between Means of Posttest I and Pretest	Posttest II and Pretest
High Fear (1 message)	1.00	2.13* +
High Fear (2 messages)	.96	1.33
Low Fear (1 message)	-.29	-1.17 +
Low Fear (2 messages)	1.08	2.00
Control	.73	.73

* 2.13 differs from 1.00 at the .05 level
+ 2.13 differs from -1.17 at the .01 level

The analysis indicated a significant main effect for stages (immediate or delayed), a significant interaction between level of fear and number of messages, and a significant interaction between level of fear, number of messages and stages. The levels of fear x number of messages interaction could not be interpreted clearly insofar as it indicated only that the mean of the three scores for one group of subjects was greater than the mean of the three scores for one or more of the other groups.

Attempts were made to find the source of the significant stages effect and the three factor interaction through use of the Student and Dunnett t-tests. The pre-test scores were compared with the post-test scores for each group to see if any groups had changed significantly. Only one of these comparisons was significant at less than the .05 level of confidence. That was the difference between the pretest mean for the high fear one message group and its delayed post-test mean (t_d= 4.79, d.f. 23, p .01).

The experimental hypotheses were tested.

Hypothesis 1. The mean difference for the one message low fear group will be significantly higher than the mean difference for the one message high fear group on the immediate post-test. No significant difference was found.

Hypothesis 2. The mean difference for the one message high fear group will be higher than the mean difference for the one message low fear group on the delayed post test.

The mean difference for the high fear group was higher (t_d= 3.7, p .01).

Hypothesis 3. The mean difference for the high fear, two message group will be higher than the mean difference for the low fear, two message group on the immediate post-test.

No significant difference was found.

Hypothesis 4. The mean difference for the high fear, two message group will be higher than the mean difference for the low fear two message group on the delayed post test.

No significant difference was found.

The difference between the mean differences for the two high fear message groups and the difference between the mean differences for the two low fear groups were examined. This was not a test planned previous to the collection of the data.

The hypothesis was that the mean difference between the mean differences for the high fear groups is significantly higher than the mean difference for the low fear groups on the immediate and delayed post tests.

For the immediate post tests no significant difference was found. For the delayed post tests the mean difference between the mean differences for the high fear groups was significantly higher than the mean difference between the mean differences for the low fear groups ($t_d = 3.34$, $p < .01$)

The resistance measure

The subjects were asked to respond to five questions regarding their responses to the communicator and the topic. It was anticipated that this portion of the analysis would lead to testable hypotheses for future research on the nature of resistance to change.

The subjects were asked to indicate the extent to which they felt that the speaker was biased, the speaker was expert, the material was based on secure information, the information was personally relevant and the relative position of the topic on their 'personal lists.' The subjects were asked to answer the attitude items as the speaker would have. The information and anxiety items were also utilized in this analysis.

This portion of the analysis was intended to find differences in the responses of those subjects who changed their attitudes in the direction recommended by the message and those subjects who did not change in the direction recommended by the message. To separate the subjects into the "changed" and "unchanged" groups the median score was computed for the immediate and delayed post tests. The median change on the immediate post test was 1.14 points, the median change on the delayed post test was 1.92 points. A subject was considered to have "changed" if, from the pretest to the two post tests his score had changed more than both medians - that is, if he had changed 1 or more points on the immediate post test and 2 or more points on the delayed post test. By this definition thirty-five subjects were considered to have "changed", and 61 of the subjects were considered to have been "unchanged" in the direction recommended by the message. The hypothesis that number of changed subjects differed by treatment groups was tested by means of a chi-square test. No significant difference was found.

Several analyses were made by use of the median test to ascertain the extent to which responses on the various measures were related to change (defined as being above the median on immediate and delayed post-tests). Each of the five main resistance measures was tested against the change measure, the anxiety measure and against the other resistance measures.

Two indices were used to assess the amount of anxiety produced in the subjects, an a priori one and a subject report. That is, the messages were classified on the basis of the experimenter's intentions

in writing them and on the basis of the pretest which a similar group of students had taken. The subjects in the present study were also asked to indicate the amount of anxiety which the message had induced in them. This was intended as an independent validation of the *a priori* naming of the messages. This was indexed by means of the following two items. The subjects were asked to indicate the extent of their agreement with the following two statements:

1. "The material made me feel anxious about my safety."

   AGREE 6:5:4:3:2:1:0 DISAGREE

2. "The material made me feel anxious about the safety of my family."

   DISAGREE 0:1:2:3:4:5:6 AGREE

The scoring system was as indicated above. The sum of the two scores was considered an index of admitted anxiety. The median index value was 6.4.

The hypothesis that changed subjects come from a population with a higher median on the anxiety measure than the unchanged subjects do was tested. No significant difference was found.

The scores on the admitted anxiety index were compared with the *a priori* categories, High Fear and Low Fear. The hypothesis that subjects in the High Fear treatments had a higher median on the anxiety measure than subjects in the Low Fear treatments was tested. No significant difference was found.

The anxiety measure was divided as it had been for the pretest, that is, with the "don't know" point as the cut-off point (7 or above = "anxious", 6 or below = "not anxious"). The relationship between message category and amount of admitted anxiety was again tested.

The hypothesis that changed subjects will be more likely to score above 7 than the unchanged subjects was tested. No significant difference was found.

The null hypothesis that more High Fear subjects than Low Fear subjects would score above 7 on the admitted anxiety index was tested. No significant difference was found.

Each of the five rejection measures was tested against each other measure, against the measure of change, against the anxiety measure and against the message categories.

Measure #1.

Each subject was asked:

"Do you think the presentation of the material was
BIASED 1:2:3:4:5:6:7 UNBIASED ?"

Scoring was as indicated. The median was 4.62.

The hypothesis was that unchanged subjects were more likely to perceive the presentation as biased than changed subjects. No significant difference was found.

The response on Measure #1 was analyzed in relation to message category. The hypothesis was: the four treatment groups come from populations with different median scores on measure #1. The results are as indicated in Table 6.

Table 6

Analysis of "Bias" Scores By Treatment Group for Unchanged S's.

	High (1)	High (2)	Low (1)	Low (2)	
"unbiased"	11	7	3	8	29
"biased"	3	9	13	7	32
	14	16	16	15	61

$X^2 = 8.56$, 3 d.f., $p < .02$

The analysis indicated that the High Fear, one message subjects were the most likely to find the material unbiased and the Low Fear, one message subjects the most likely to perceive the material as biased.

The relationship between admitted anxiety and response on measure #1 was tested. The hypothesis was that subjects who were above the median on admitted anxiety ("anxious") come from a population with a lower median on measure #1 than subjects who were below the median on admitted anxiety ("not anxious"). No significant difference was found.

Measure #2.

The subjects were asked to respond to the following statement.

"Do you consider the speaker (Dr. Barnes)
EXPERT 7:6:5:4:3:2:1 INEXPERT "

The scores for each response are indicated above. The median score on this item was 6.08. The hypothesis was: Changed subjects will be more likely to perceive the speaker as expert than unchanged subjects. No significant difference was found.

The response on measure #2 was analyzed in relation to message category. The hypothesis was: the four treatment groups come from populations with different medians on measure #2. No significant difference was found.

The relationship between admitted anxiety and measure #2 was examined. The hypothesis was: subjects who are above the median on admitted anxiety come from a population which has a higher median on measure #2 than do subjects who are below the median on admitted anxiety. No significant difference was found.

Measure #3

The subjects were asked to respond to the following question:

"To what extent do you think the predictions made by the speaker have a secure basis in fact?

SECURE 7:6:5:4:3:2:1 NOT SECURE "

The scores for each response are indicated above. The median score on this item was 6.03.

The hypothesis was: changed subjects will be more likely to perceive the speaker as expert than unchanged subjects. Results are indicated in Table 7.

Table 7

Analysis of Change and Perceived Secureness of Predictions

	"secure"*	"not secure"	
"changed"	23	12	35
"unchanged"	26	35	61
	49	47	96

$X^2 = 3.8663$, 1.d.f., $p < .05$

* "secure" refers to a score of 6 or above.

The analysis indicated that those subjects who perceived the predictions as not being securely based on facts were least likely to change.

The response on measure #3 was analyzed in relation to the message categories. The hypothesis was: The four treatment groups come from populations with different medians on measure #3.

The relationship between admitted anxiety and measure #3 was examined. The hypothesis was: subjects who are above the median on admitted anxiety come from a population which has a higher median on measure #3 than do subjects who are below the median on admitted anxiety. No significant difference was found.

Measure #4.

The subjects were asked to respond to the following question.

"In relationship to other things which you can think of that are potential dangers, how high on your 'personal' list of worries is this particular one?

HIGH 7:6:5:4:3:2:1 LOW "

The scores for each response are indicated above. The median for this item was 2.88.

The hypothesis was: changed subjects are more likely to put the topic high on their "personal lists" than are unchanged subjects. No significant difference was found.

The response on item #4 was analyzed in relation to message categories. The hypothesis was: The four treatment groups come from populations which have different medians on measure #4. No significant differences were found.

The relationship between admitted anxiety and response on measure #4 was examined. The hypothesis was: Subjects who are above the median on admitted anxiety come from a population which has a higher median on measure #4 than do subjects who are below the median on admitted anxiety. No significant difference was found.

Measure #5

The subjects were asked the following question:

"How applicable do you think the material was to you personally?

APPLICABLE 7:6:5:4:3:2:1 NOT APPLICABLE "

The scores for each response are indicated above. The median score on this measure was 5.60. The response on measure #4 was analyzed in relation to amount of change. The hypothesis was: changed subjects are more likely to be above the median on measure #5 than are unchanged subjects. No significant difference was found.

The response on measure #5 was analyzed in relation to the message categories. The hypothesis was: The four treatment groups come from populations which have different medians on measure #5. No significant difference was found.

The response on measure #5 was examined in relation to admitted anxiety. The hypothesis was: Subjects who are above the median on admitted anxiety come from a population which has a higher median on measure #5 than do subjects who are below the median on admitted anxiety. No significant difference was found.

The measures #1,2,3,4,5 were then analyzed in relation to each other. The intent was to discover relationships between responses on each with the others. The general null hypothesis was: scores above the median on one measure are as likely to be above the median on any or all of the other measures.

Only two such comparisons were significant. They are presented in tables 8 and 9.

Table 8

Comparison of Scores on Index of Personal Applicability and Personal List For Unchanged Subjects

	Above Median on Personal List	Below Median on Personal List	
Above Median on Applicability	14	7	21
Below Median on Applicability	12	28	40
	26	35	61

$X^2 = 6.025, 1$ d.f., $p < .02$

Table 9

Comparison of Scores on Secureness Index and Expertness Index For Unchanged Subjects

	Above Median on Secureness	Below Median on Secureness	
Above Median on Expertness	20	12	32
Below Median on Expertness	6	23	29
	26	35	61

$X^2 = 9.231, 1$ d.f., $.01 < p < .001$

The analysis above indicated a significant relationship between response on measures #2 and #3, i.e., subjects who were below the median on the measure of perceived expertness were also likely to be below the median on the perceived secureness of the predictions.

The analysis also indicated a significant relationship between measures #4 and #5. That is, subjects who indicated they perceived the applicability of the material as low (below median) were also likely to indicate that the topic was low on their "personal lists." The relationship between measures #2 (perceived expertness of speaker) and measure #4 (perceived applicability) approached the .05 level but did not reach it.

Summary of analysis of measures 1-5

Significant relationships were found among the "unchanged" subjects on these measures: between treatment group and perceived bias, i,e., subjects in the Low, one message group were likely to perceive the material as biased, subjects in the High, one message group were likely to perceive the material as unbiased; between perceived expertness and perceived secureness of predictions, i,e., subjects who indicated that the speaker was not expert were likely to say that the predictions did not have a secure basis in fact; between personal applicability of the material and position on "personal list", i.e., subjects who did not perceive the material as personally applicable were likely to rank the topic of the message as low on their "personal list" of worries. Perceived secureness of facts underlying the predictions was the only measure significantly related to change.

Other measures of Resistance

The subjects were asked five questions about information mentioned in the message. These information items were asked as a check on possible attention factors, as a potential measure of resistance through lack of attention. The median number of items correct was 3.4. The relationship of information to admitted anxiety, treatment group and amount of change were analyzed. The hypotheses were: a) subjects who are above the median on information correct are more likely to be among the changed subjects than among the unchanged subjects; b) subjects who are below the median on admitted anxiety are from a population with a higher median score on information than are subjects who are above the median on admitted anxiety; c) the four treatment groups come from populations which have the same median on the information test. No significant differences were found on hypotheses a) and b). A significant difference was found on hypothesis c) (see Table 10).

Table 10

Analysis of Information in Relation to Message Group

	High (1)	High (2)	Low (1)	Low (2)	
Above Median (3 or more correct)	9	16	13	20	58
Below Median (2 or fewer correct)	15	8	11	4	38
	24	24	24	24	96

$X^2 = 7.896, 3$ d.f., $.02 < p < .01$

The one message High group had the fewest correct and the Low 2 message group had the most correct.

The subjects were also asked to respond to six of the attitude items as the speaker would have responded. These scores were correlated with the scores the subjects had on the same items. This was intended as a replication of the finding by Kelley and Woodruff (1957) that many of the subjects in their study - which had involved a recording intended to be persuasive - who were below the median on information items correct, also exhibited a high correlation between their own attitudes and those which they attributed to the speaker.

In the present study, subjects were divided at the median on information items correct and a product moment correlation was computed for S's above the median between own score and score attributed to the speaker. Another correlation was computed for the S's below the median between own attitude and that attributed to the speaker. The first correlation proved not significant ($r = -.036$) and the second was not significant ($r = .032$).

Another set of analyses was made of the relationship between own attitude and that attributed to the speaker divided the subjects on the basis of the "change" measure. The subjects were divided into two groups, "changed" and "unchanged". The correlation between the scores of the "changed" S's and those attributed to the speaker was significant ($r = .356$, $.025 < p < .01$, $n=35$). The correlation between the scores of the "unchanged" S's and those attributed to the speaker was significant ($r = .219$, $.05 > p > .025$, $n=61$).

The mean score attributed to the speaker by the changed S's

was 20.2; the mean score attributed to the speaker by the unchanged S's was 20.52. The difference was not significant ($t = .515$, 94 d.f., $p > .10$). The mean score on these items of the unchanged S's was 15.114; the mean score on these items of the changed S's was 17.028. The difference was significant ($t = 2.917$, $p < .01$, 94 d.f.).

The difference between the scores attributed to speaker and own score for the changed group was significant ($t = 5.116$, $.005 > p > .0005$, 35 d.f.) as was the difference between the scores for self and speaker for the unchanged subjects ($t = 11.398$, $.005 > p > .0005$, 61 d.f.)

CHAPTER IV

The following conclusions may be made from this study:

1. There was no significant difference between the amounts of attitude change produced by the low fear message and the high fear message as measured immediately after the presentation of the message.
2. The high fear message induced significantly more attitude change in the suggested direction than did the low fear message as measured several weeks after the presentation of the message.
3. There was no significant difference between the amount of attitude change produced by a series of high fear messages and the amount produced by a series of low fear messages as measured immediately after the messages.
4. There was no significant difference between the amount of attitude change produced by a series of high fear messages and the amount produced by a series of low fear messages as measured several weeks after the messages.
5. Those subjects who did not change their attitudes were most likely to resist the messages by saying that the message(s) were not securely based on facts.
6. Those subjects who said that the message was not based on secure facts were also likely to say that the source was inexpert.

7. All subjects showed a significant tendency to perceive the speaker's position as similar to their own. Those subjects who changed their attitudes perceived the speaker as having an attitude closer to their own than did those subjects who did not change.
8. The subjects continued to change their attitudes on the delayed test in the same direction as they had on the immediate test rather than regressing toward their initial attitudes.

Attitude Change

Attitude change was strongly resisted by the subjects in the present study as indicated by the fact that none of the treatment group means changed significantly more than the control group mean. The discussion of "changed" subjects and "unchanged" subjects disregards the fact that "change" in this study was not very great.

A possible reason for the slight amounts of change found, as well as for the one treatment group whose mean went in the opposite direction than the message recommended, may be the relatively low amount of anxiety produced by the message. (Although "discomfort", a term which includes anxiety but is not encompassed by anxiety, was the internal state which was expected to yield the hypothesized results, only "anxiety" could be indexed.)

The scores of the high fear subjects on the anxiety measure had a median of six out of a possible twelve points. This median was at approximately the scale mid-point indicating that the level of anxiety aroused was not as high as had been planned.

This finding was unexpected in the light of the pre-test finding that the messages produced differential amounts of anxiety in the subjects.

The possibility that a weakness in the self-report index was responsible for the difference was rejected because the item was identical for pre-test and experimental groups.

Another possibility which can not be easily dismissed involves the circumstances under which the messages were given. The pre-test group was asked only to help evaluate some messages. The experimental group had also been asked to fill out a questionnaire a few days earlier. Pains had been taken to give the impression that the messages and questionnaires were part of a large project involving the experimental topic. The subjects in the experimental group may have withheld emotional involvement from the messages and attempted to evaluate the recordings on a more or less intellectual basis. Evidence for such a response is supplied by a question asked of the subjects on the final post test.

The subjects had been asked whether they would like to hear the same side of the controversial topic or the same side of the issue. Not a single subject asked to hear the side already heard. It is reasonable to argue that such a response would not have been so prevalent

unless the subjects had looked on the message situations as an opportunity to hear both sides of a controversial topic, or as an educational experience. This would enable the subjects to at least partially withdraw emotionally from the message and to make an attempt to examine the controversy more or less dispassionately. Another aspect of the message makes this interpretation seem reasonable.

The recommendations in the message were such as to enable the subjects to refrain from personally involving themselves. That is, although the effects of radiation may have been seen as threatening to them personally, the recommendations for a community shelter may have been seen as the province of the community or the government rather than something which they could personally participate in.

Another reason for believing that the subjects resisted personal involvement with the topic is the finding that the subjects in the pre-test and the experiment reported that all of the messages were quite interesting. This is contrary to the findings of Haefner, Janis and Feshbach, and Berkowitz and Cottingham that their high fear messages were considered significantly more interesting by their subjects than their low fear messages.

A further contributing factor to the relative ineffectiveness of the experimental manipulation of anxiety may have involved the fact that the messages were too brief to arouse much anxiety on the relatively familiar topic of the dangers of radiation. Although the pretest group had indicated that the same messages aroused differential amounts of anxiety while the experimental group did not, there was another difference between the two sets of subjects.

Two pairs of messages were tested on the two classes which were involved in the pretest. Each class heard a high fear message from one pair and a low fear message from the other. Although the subjects were asked to indicate the amount of anxiety the most recent message had induced in them, they may have used the other messages as referents. In such a case, the low fear message used in the experiment would have induced little anxiety on its own and would have appeared weak in relation to the other message. The high fear message used in the experiment might have seemed relatively unfrightening on its own but frightening in relation to the other message which accompanied it. It cannot be shown that such a comparison did occur and some other indicator might have made it possible to find an indication of how much anxiety each produced without having to depend on subject reports. If such a comparison had taken place it would explain the difference in response to the two experimental messages by the pre-test and experimental groups.

A further reason for the relative ineffectiveness of the experimental induction of fear may lie in the familiarity of the topic. The topic of the messages must have been a familiar one to the subjects insofar as it has received a good deal of attention in recent years. It is also a topic which has frequently been treated in a manner which is more anxiety producing than were the present messages.

Janis (1962) notes on the basis of field studies that unless a message on a familiar threat makes a threat seem more likely than anticipated or adds new information to what was already known, it will have the effect of pacifying the receiver and will lead him to ignore or reject the message.

No effort was made to make the threat of war seem more likely, and the discussion of the dangers of radiation may not have made the threat of radiation damage seem any more dangerous than the subjects already believed it was.

If Janis' observation is applicable to the present messages, a possible explanation for it would be that presenting no new threats or evidence of increased likelihood has the effect of producing a ceiling on the amount of fear which the message can produce since it is no longer a new threat. This would explain, in part, why the message would be ignored or rejected.

If such a ceiling were placed on the amount of discomfort the experimental message could create, it would preclude the high amount of discomfort which the rationale for the present study suggested would be necessary before the hypothesized effects on attitudes could be found.

It was hypothesized that a highly discomforting message would produce attitude changes. There is no evidence in the present study that such a condition was created. The finding that none of the message groups changed significantly more than the control group would seem to indicate that the resistance and rejection, for the reasons mentioned in preceding pages, did occur.

The significant differences between the means of treatment groups may be attributable to the slight downward shift of the one message, low fear group and the slight upward shift of the other three treatment groups.

One of the findings of this study was that although the subjects who changed their attitudes and those who did not, attributed almost

the same attitude to the speaker, those subjects who did not change had less favorable attitudes toward the topic. That is to say the mean score attributed to the speaker by the changed and unchanged subjects did not differ. The mean score of the unchanged subjects was significantly lower than the mean score of the changed subjects. This suggests that the subjects who were initially most favorable to the position in the message were most likely to accept the message. Those subjects who were initially least favorable to the position of the message were least likely to accept it.

Examination of the pre-test means of the four message groups indicates that the low-fear, one-message group had the lowest pre-test mean. This was the group whose mean went away from the direction recommended in the message ("boomeranged"). The amounts of change of the other three groups is in the same rank order as the initial scores. These findings indicate that initial attitude was very likely the key variable in the present study rather than amount of fear produced as far as attitude change was concerned.

Resistance to the message

An examination of various possible modes of resistance to the messages indicated only one of those tested was significantly related to change of attitude. Subjects whose attitudes were not changed were significantly more likely than those whose attitudes were changed to say that the message was not based on secure facts. Saying that the messsge was not securely based on facts was significantly related to saying the source was inexpert for the unchanged subjects.

Although the subjects may have legitimately considered the source of the message inadequate - that is, criticism need not imply defensiveness - these two measures can be considered defenses against the recommendations which took the form of trying to invalidate the message. Other resistance measures may have also been used, but they are not as clearly related to rejection of the message as the two measures noted.

Two of the resistance measures are particularly interesting in light of previous studies.

Adams (1961), (Maccoby, et. al., 1961) found that many of their subjects accepted offers to hear information which supported their own positions and rather than the opposing position. This was interpreted as an attempt to reduce dissonance. The subjects in the present study were asked to choose whether given another message they would prefer the same side or the opposite side.

It was anticipated that some unchanged subjects would accept such an opportunity to reduce dissonance by receiving supportive information. No subject asked to hear the same side as had been presented. This may be an indication that the message was not taken seriously. That is, the students who participated in the study were not frightened very much by the experimental message and would therefore have little need for such a means of resisting the message. They asked for the opposing side in the interests of intellectual fairness rather than because they had any emotional need for such support.

Janis and Feshbach, Berkowitz and Cottingham and Haefner found that their treatment groups acquired information from the messages to

the same extent. That is, there was no evidence on the basis of information tests that their high fear groups had attempted to avoid threatening messages through inattention.

The subjects in the present study were given a similar test of information. No evidence was found which would indicate that inattention was more likely in the unchanged subjects than in the changed subjects. A significant difference was found in the information scores of two groups. The low fear series group had the most correct answers. The high fear, one message group had fewest correct answers. These two groups changed their attitudes more than the two intermediate groups, indicating again no direct relationship between information (and attention) and attitude change.

Although only one of the resistance measures used was found to be significantly related to whether or not subjects changed their attitudes, the small amounts of change found may indicate that even changed subjects resisted the messages. In other words, resistance and minor change were not mutually exclusive. This would be consistent with the finding that attitude changes took place but were not very large.

One resistance measure which may have been used by a large number of subjects though it was not related to amount of attitude change was the item which referred to a "personal list." The subjects were asked to indicate how high on their "personal lists" of worries the topic was. The median score on this item for the total group was 2.88; the scale went from 1 (low) to 7 (high). The low median is an indication, if taken literally, that the subjects do not worry about

fallout radiation as much as they worry about many other dangers. It is also an indication of a mode of resistance mentioned by Osgood (1960). Osgood noted that many people resist dissonant messages on the link between smoking and cancer by telling themselves that they are also likely to die in automobile accidents. Osgood calls this adding supporting elements. The low median, which was also the lowest of the five resistance measures used, indicates that mahy subjects, changed and unchanged made use of this mode of dissonance reduction.

Another measure asked subjects how personally applicable to themselves the message was. The median for the total group was 5.6 on a 7 point scale (higher numbers indicating high applicability). This is relatively high but the score on this measure was not related to change. Responses on this index were related to scores on the "personal list" measure. That is, subjects who said the danger was low on their personal lists of worries also were likely to say that the message was not personally applicable.

The two measures are similar in content but the difference in median scores indicates that they are not interchangeable. The applicability measure may have tapped a response in the category which Osgood refers to as "eliminating old dissonant elements." One response in this category, which includes avoiding reading or thinking about the threat, would consist of not denying the threat but only that it could happen to him. This would be close to the item in the personal applicability index and is interpreted as such here.

Osgood discussed four general modes of dissonance reduction. These were a) changing behavior to be consistent with cognition

(attitude change), b) changing cognitions to be consistent with behavior (e.g., questioning validity of information), c) adding supporting elements to existing cognitions, d) eliminating old dissonant elements (e.g., avoiding or ignoring dissonant material). One of the objectives of the present study was to find evidence as to whether these types of responses are mutually exclusive. The results of the present study indicate that these response categories are not mutually exclusive. That is, subjects may change slightly and still utilize one or more of these response alternatives. Subjects may not change their attitudes and utilize several of these response alternatives.

A tendency was also found for unchanged subjects who said the message was not based on secure facts to also say that the message was not personally applicable. The relationship approached but did not reach statistical significance, but it is worthy of notice nonetheless.

The findings of the present study indicate that subjects resist dissonance producing messages through a variety of techniques which are not mutually exclusive. That is, subjects will use several methods at once to reduce dissonance, rather than only one. Several methods will be used regardless of whether he changes his attitudes. This may explain why the delayed measure showed a tendency to continue in the direction indicated in the immediate measures - the immediate responses reduced but did not eliminate dissonance. If they had eliminated dissonance, further changes and more than one response type would not have been necessary.

IMPLICATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The finding that anxiety was differentially produced in the pretest and experimental groups indicates that the communicator's intent in creating a message is not necessarily isomorphic with the response actually induced. An implication for further research is that research should be done to find the variables which induce anxiety in subjects.

Research into the effects of fear appeals on behavior and attitude change may have to await further research on the types of stimuli which reliably create anxiety in subjects. Miller (1963) has suggested that certain cues denoting social disapproval may be one such class of content variables which will reliably induce anxiety.

Although the slides used by Janis and Feshbach and Berkowitz and Cottingham probably contributed a good deal to the effectiveness of their messages, there is no way of knowing the extent of that contribution. This suggests that research on channel variables is another task of future studies on fear appeals.

Channel and content variables are two aspects of messages related to anxiety as a dependent variable. Another important aspect of fear appeal research is measurement of anxiety. One reason why a good measure of anxiety is needed is that it is not sufficient for the communicator to say that his message is threatening, the audience must agree. Past studies have used simple questions to index anxiety and to validate their contentions that the message was threatening. This means that the communicator relies on the subjects verbal response to the message.

A more important reason for the development of such a measure of anxiety involves the findings of research on fear appeals. Hovland, Janis and Kelley (p.83) suggested that as emotional tension increases from zero to some moderate level, acceptance may tend to increase. As it reaches higher levels, it tends to decrease, and as it gets still higher acceptance may again increase. Festinger suggests a similar curvilinear relationship between dissonance and change. A great problem is specifying on some scale, the points at which these responses occur. Development of a scale of anxiety would make possible such quantification.

Although it is not suggested that anxiety and dissonance are isomorphic, anxiety is probably a concomitant of dissonance. Whether the effects of fear appeals are to be analyzed using a "learning theory" approach as Hovland, Janis and Kelly did, or a balance theory approach as in the present study, such an anxiety scale would be invaluable.

The findings of the present study were not conclusive as to delayed effects of threatening messages or the effects of a series of such messages. Future research is needed using longer delays than those used in the present study and using longer series than those used in the present study.

Future research should examine also modes of dissonance reduction. In the present study, subjects were presented with fixed alternative items to measure defensiveness. Future studies should make provision for interviews which would allow subjects to choose one or more modes of dissonance reduction spontaneously. Provision for study of

effects of messages besides change in the direction of the message should be made in all studies of the effects of fear appeals.

Such modes of dissonance reduction could be linked to the level of dissonance. In such a manner, propositions might be made specifying the effects of appeals containing a specific degree of threat.

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APPENDIX A

Experimental Messages

Interviewer: Today I am talking to Dr. William Barnes, professor of nuclear research at the Nuclear Research Center. Our program is concerned chiefly with the problem of fallout in the event of nuclear war, and the role of fallout shelters in case of such an eventuality. First of all, perhaps it would be of value to know something about the nature of fallout. Dr. Barnes, exactly what is fallout and what are its effects?

Answer: In answer to your first question, what is fallout, it is radioactive dust particles resulting from nuclear explosion. The millions of tons of earth and debris are sucked up by the fireball and are spread by prevailing winds for hundreds of miles from the blast site where they fall to earth and decay. The early fallout which carries the bulk of the radiation danger, descends in less than 24 hours. The size of the particles range from fine powder to the size of table salt and chances are that the fallout although only special instruments could tell if it is radioactive.

As to your second questions, there is no simple answer to what effect fallout has on human life. We do know that the body is capable of withstanding or recovery from small amounts of radiation. Actually, we are constantly exposed to radiation from natural sources, but the amount of radiation is very small at any given time. Following a nuclear explosion, however, people may be exposed to large

amounts of radiation in a short period of time. Such exposure could result in injury to internal organs or death. Young people would be more susceptible to the effects of radiation than older people because radioactive elements are more easily absorbed into the bones and internal organs of young people. The specific effects of radiation would depend on the amount of exposure, the length of exposure and various other factors.

Interviewer: Is there no protection from radiation?

Answer: There certainly is protection. Although there is no pill or special clothing which would offer protection. Protection from the direct effects of a nearby explosion is virtually impossible within one or two miles of the blast, depending on the size of the bomb, but protection from fallout borne radiation would be relatively simple and some 80 million lives could be saved if a proper shelter program is instituted. Placing dense materials between your body and sources of radiation is the key to protection. The best protection is an underground shelter which has three feet of sand or earth above it. Two feet of concrete or 7 1/2 inches of iron and steel, or three inches of lead will give this same high level of protection. An ordinary house without basement will probably cut the radiation in half. In fact, staying in a house basement would probably reduce one's exposure to one tenth the outside exposure.

Interviewer: How about food and water and air after an attack?

Answer: This would not create great problems, although we do expect that your shelter would have a two week supply of food and water. Food and water that have been exposed to fallout radiation will be contaminated only to the extent that they contain radioactive particles. Exposed food that may have fallout particles on it can be made safe after washing, brushing or peeling. Fallout particles can be removed from water by a simple process of sedimentation or filtering. Once the early fallout had decayed, a process which might take from two days to two weeks, it would be quite safe to breathe the outside air. In fact, shelters need not be airtight to be safe if they keep radioactive particles out. And of course there is no reason to fear contact with people who have radiation sickness since it is neither contagious nor infectious. Shelter for the first few days will save many people from harm.

Interviewer: What would be the role of private shelters in protecting from fallout?

Answer: Although adequate private shelters could be constructed for less than $300, we do not recommend them except in isolated locations where other shelter is not available. Community shelters would be necessary for the protection of the many people who could not afford family shelters or who do not live in private homes. They will also

protect many people who might not be at home during an attack and would need shelter.

Interviewer: Dr. Barnes, how long would it take to provide enough shelter to protect most of the population?

Answer: We estimate that by the end of Fiscal year 1967, we can have some 233.5 million shelters spaces. This would be enough to protect virtually all of the 1967 population. The spaces would not be hard at all to find since the best protective materials are also among the cheapest and most readily available. These materials were used in most buildings constructed between the turn of the century and the end of World War II. Our largest task is identifying, marking and stocking such buildings. It is quite likely that such buildings would require little or no structural modifications and will cost less than $4 per shelter space to identify, mark and stock. Many new buildings are being built with shelter space planned into them.

Interviewer: How effective would such a program be in saving lives?

Answer: We have calculated, under various types of attack, looking ahead to various dates, assuming various enemy attack motives, the number that might be saved by the system of community fallout shelters which is the objective of the government's program. Under the worst possible conditions of attack we are convinced that enough lives would be saved to assure a base of recovery

of the nation. In general, we have concluded that fallout shelters in enough quantity for substantially all Americans would save up to 85% of the lives that would otherwise be lost.

High Fear

Interviewer: Today I am talking to Dr. William Barnes, professor of nuclear research at the Nuclear Research Center. Our program is concerned chiefly with the problem of fallout in the event of nuclear war, and the role of fallout shelters in case of such an eventuality. First of all, perhaps it would be of value to know something about the nature of fallout. Dr. Barnes, exactly what are the effects of fallout?

Answer: There is no simple answer to your question, what are the effects of radiation. We know that the body is capable of withstanding or recovering from small amounts of radiation. Actually we are constantly exposed to radiation from natural sources, but the amount of radiation is very small at any given time. In a lifetime, from natural sources, from such things as X-rays and radium dial watches, one might be exposed to only about 10 roentgens of radiation. Following a nuclear explosion, however, you may be exposed to large amounts of radiation in a short period of time. Such exposure could easily result in severe illness or death. The effects would depend on how far from the blast you are and how long you had been exposed as well as the particular radioactive elements you were exposed to. Now, the entire population of the area in a strip 20 miles wide and 100 miles down wind from a detonation would receive

doses of at least 600 roentgens - which would fatally injure them, of course, if they had no protection. It would take you from 2 to 12 weeks to die. If the main source of radiation had been radioactive strontium, the effect could be bone cancer. On the other hand, if the main source had been radioactive iodine, cancer of the thyroid might be the result. Radiation sickness in its mild and moderate form would manifest itself in nausea, lack of appetite, vomiting and prostration, but recovery would occur in a few weeks. Severe radiation sickness has all these early symptoms, but they vanish after a few days and are replaced by fever, mouth soreness, diarrhea, ulceration of the gums and mouth. Recovery might take seven or eight weeks and of course death might come in hours or weeks if the exposure had been large enough.

Young people are more susceptible to radiation sickness than older people because radioactive elements are more easily absorbed into the bones of young people. Since young people are potential parents, protection would minimize the genetic effects on their descendants resulting from too much exposure to radiation.

Interviewer: Is there no protection from radiation?

Answer: There certainly is protection. Although there is no pill or special clothing which would offer protection. Of course protection from the direct effects of a nearby

explosion is virtually impossible, protection from fallout-borne radiation would be relatively simple and some 80 million lives would be saved if a proper shelter program is instituted. Placing dense materials between your body and sources of radiation is the key to protection. The best protection is an underground shelter which has three feet of sand or earth above it. Two feet of concrete or 7 1/2 inches of iron & steel, or three inches of lead will give you this same high level of protection from death or serious illness.

Interviewer: How about food and water and air after an attack?

Answer: This would not create great problems. Food and water that have been exposed to fallout radiation will be contaminated only to the extent that they contain radioactive particles. (fallout particles are generally visible, you know) Exposed food that may have fallout particles on it can be made safe by washing, brushing or peeling. Fallout particles can be removed from water by a simple process of sedimentation or filtering. Once the early fallout had decayed, a period which might take from two days to two weeks, it would be quite safe to breathe outside air. In fact, shelters need not be airtight to be safe. And of course there is no reason to fear contact with people who have radiation sickness since

it is neither contagious nor infectious. If you can just find shelter for the first few days you will likely be saved from death or serious injury.

Interviewer: What would the role of private family shelters be in protecting from fallout?

Answer: Although adequate private shelters could be constructed for less than $300, we do not recommend them except in isolated locations where no other shelter is available. Community fallout shelters would be necessary to save the lives of the many people who can not afford private shelters or who do not live in private homes. They will also save from destruction many who might not be at home during an attack and would need shelter.

Interviewer: Dr. Barnes, how long would it take to provide enough shelter space to protect most of the population?

Answer: We estimate that by the end of Fiscal Year 1967, we can have some 233.5 million shelter spaces. This would be enough to protect virtually all of the 1967 population. The spaces would not be hard at all to find since the best protective materials are also among the cheapest. These materials were used in most buildings constructed between the turn of the century and the end of World War II. Our largest task is identifying, marking and stocking such buildings. It is quite likely that such buildings would require little or no structural modifications and will cost less than $4 per shelter space to identify, mark and stock.

Interviewer: How effective would such a program be in saving lives?

Answer: We have calculated, under various types of attack, looking ahead to various dates, assuming various enemy attack motives, the number that might be saved by the system of community fallout shelters which is the objective of the government's program. Under the worst possible conditions of attack we are convinced that enough lives would be saved to assure a base of recovery of the nation. In general, we have concluded that fallout shelters in enough quantity for substantially all Americans would save up to 85% of the lives that would other wise be tragically lost.

APPENDIX B

Pretest

Study 75 (C.D) Pretest

We are pre-testing this questionnaire for future use. Your personal responses to the following items would be of great value to us. We appreciate your cooperation.

Part A.

Here are some statements people have made about the possibility of protecting yourself from a nuclear war. Please indicate by making a checkmark which word-description best describes how you feel about the statement.

1. Building a shelter is like hiding in a hole--only a coward would do it.

__ Strongly Agree

__ Agree

__ Don't Know

__ Disagree

__ Strongly Disagree

2. "It is a person's duty to live as long as he can."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*3. "Community fallout shelters may not save us, but they are the only chance we have to survive."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

4. "Khruschev would ease up on the war threat if we built large numbers of fallout shelters in this country.

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

5. "I would not have time to get to a community shelter if a nearby city were bombed."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*6. "There is no protection against the long-range effects of radioactive fallout."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

Disagree Strongly

*7. "Everybody should know the location of the nearest community shelter."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

8. "Building fallout shelters merely shows pessimism."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*9. "Community fallout shelters would not be practical in my community."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*10. "Our community officials should begin plans now to provide fallout protection for our entire community."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*11. "The building of community fallout shelters is wrong because it increases the 'war scare'."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*12. "If we had a nuclear attack, I would go to a community fallout shelter."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*13. "The drive to build community fallout shelters is merely a money-making scheme."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

14. "Air pollution due to a nuclear blast would eventually pollute the air inside shelters."

__ Agree Strongly

__ Agree

__ Don't Know

__ Disagree

__ Disagree Strongly

*Critical items

APPENDIX C

Discomfort Measure

We are very much interested in your response to the recording you just heard. We would appreciate your indication below of that response. Please indicate by checkmark the extent of your agreement or disagreement with each of the statements. Thank you again for your time and patience.

1. I would say that the presentation of the material was pleasant.

   AGREE__:__:__:__:__:__:__:DISAGREE

2. The material was interesting.

   DISAGREE__:__:__:__:__:__:__:AGREE

3. The material made me feel anxious about my safety.

   AGREE__:__:__:__:__:__:__:DISAGREE

4. The material made me feel anxious about the safety of my family.

   DISAGREE__:__:__:__:__:__:__:AGREE

COMMENTS:

APPENDIX D

Immediate Posttest

Project CD 75 REVISED

Survey Pretest

We are pretesting this questionnaire for future use. Your personal responses to the following items would be of great value to us. We appreciate your cooperation.

Here are some statements people have made about the possibility of protecting yourself from a nuclear war. Please indicate by checkmark which word description best indicates how YOU feel about the statement.

*1. "Community fallout shelters may not save us, but they are the only chance we have to survive."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

2. "There is a new pill you can take that will protect you from radioactive fallout."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

3. "If someone has radiation sickness, you should avoid getting near him so you won't catch it yourself."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

*4. "There is no protection against the long range effects of radioactive fallout."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Strongly Disagree__

5. "Most fallout rapidly loses its power to harm people."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Strongly Disagree__

*6. "Everybody should know the location of the nearest community shelter."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Strongly Disagree__

7. "A fallout shelter should have an airtight door to guard against radiation."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Strongly Disagree__

*8. "Community fallout shelters would not be practical in my community."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

9. "You cannot see fallout."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

*10. "Our community officials should begin plans now to provide fallout protection for our entire community."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

*11. "The drive to build community fallout shelters is merely a money-making scheme."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

*12. "If we had a nuclear attack, I would go to a community fallout shelter."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

*13. "The building of community fallout shelters is wrong because it increases the 'war scare'."

Agree Strongly__ Agree__ Don't Know__ Disagree__ Disagree Strongly__

*Critical items

RECORDING STUDY

The other day we asked you to listen to a recording. We would appreciate your views on certain aspects of the recording.

1. Do you think the presentation of the material was

BIASED___:___:___:___:___:___:___UNBIASED ?

2. Do you consider the speaker (Dr. Barnes)

EXPERT___:___:___:___:___:___:___INEXPERT ?

3. To what extent do you think the predictions made by the speaker have a secure basis in fact?

SECURE___:___:___:___:___:___:___NOT SECURE

4. How applicable do you think the material was to you personally?

APPLICABLE___:___:___:___:___:___:___NOT APPLICABLE

5. In relationship to other things which you can think of that are potential dangers, how high on your "personal list" of worries is this particular one?

HIGH___:___:___:___:___:___:___LOW

6. To what extent do you feel that your own future thinking will be guided by what you have heard in this recording?

VERY MUCH___:___:___:___:___:___:___NOT AT ALL

How do you think Dr. Barnes would respond to the following statements?

"Community fallout shelters may not save us but they are the only chance we have to survive."

AGREE___:___:___:___:___:___:___DISAGREE

"There is no protection against the long-range effects of radioactive fallout."

AGREE___:___:___:___:___:___:___DISAGREE

"Everybody should know the location of the nearest community shelter."

AGREE___:___:___:___:___:___:___DISAGREE

"If we had a nuclear attack, I would go to a community fallout shelter."

AGREE___:___:___:___:___:___:___DISAGREE

"The drive to build community fallout shelters is merely a money-making scheme."

AGREE___:___:___:___:___:___:___DISAGREE

"The building of community fallout shelters is wrong because it increases the 'war scare'."

AGREE___:___:___:___:___:___:___DISAGREE

APPENDIX E

Delayed Posttest

PROJECT CD 75 REVISED

We are pretesting this questionnaire for future use. Your personal responses to the following items would be of great value to us. We appreciate your cooperation.

Here are some statements people have made about the possibility of protecting yourself from a nuclear war. Please indicate by check-mark the alternative which best indicates how YOU feel about the statement.

*1. "Community fallout shelters may not save us, but they are the only chance we have to survive."

AGREE____:____:____:____:____:____:____DISAGREE
D.K.

*2. "Everybody should know the location of the nearest community shelter."

AGREE____:____:____:____:____:____:____DISAGREE
D.K.

*3. "There is no protection against the long range effects of radioactive fallout."

AGREE____:____:____:____:____:____:____DISAGREE
D.K.

*4. "Fallout shelters would not be practical in my community."

AGREE____:____:____:____:____:____:____DISAGREE
D.K.

*5. "Our community officials should begin plans now to provide fallout protection for our entire community."

AGREE____:____:____:____:____:____:____DISAGREE
D.K.

*6. "The drive to build community fallout shelters is merely a money-making scheme."

AGREE____:____:____:____:____:____:____DISAGREE
D.K.

*Critical items

*7. "If we had a nuclear attack, I would go to a community fallout shelter."

AGREE_____:_____:_____:_____:_____:_____:_____DISAGREE
D.K.

*8. "The building of community fallout shelters is wrong, because it increases the 'war scares'".

AGREE_____:_____:_____:_____:_____:_____:_____DISAGREE
D.K.

*Critical items

1. How much chance is there of a nuclear war in the near future?

a strong chance __ some chance __ don't know __ not much chance __

no chance __

2. If a war should occur, how likely do you think you are to be endangered where you are living now?

very likely __ likely __ don't know __ unlikely __ very unlikely __

3. If a nuclear war should occur, would it be within the next _____?

5 years __ 10 years __ 15 years __ 20 years __ 25 years __

4. The issue of protection from the effects of nuclear explosures is somewhat controversial. If we were to ask you to listen to another tape, would you rather hear the same side of the issue or an opposing view?

same side ___ opposition side ___ no preference ___

5. How strongly would you prefer to hear the side you indicated in question 4?

STRONGLY_____:_____:_____:_____:_____:_____:_____NOT STRONGLY
D.K.