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Communicator-Credibility and Communication-Discrepancy as Determinants of Opinion Change

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BOSTON UNIVERSITY

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Dissertation

COMMUNICATOR-CREDIBILITY AND COMMUNICATION-
DISCREPANCY AS DETERMINANTS OF OPINION CHANGE

by

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Introduction

In recent years there are increasing numbers of experimental researches where the variables involved in opinion change are successfully isolated and independently manipulated in order to assess the net effect of each of the variables. Among those variables, communicator-credibility and communication-discrepancy were quite extensively examined under various experimental conditions, and one could make fairly stable generalizations as to the role played by each of them on opinion change. However, little attempt has been made to incorporate these variables into a single experimental design in order to assess their separate as well as their combined effects. The main interest of the present study, therefore, is to vary experimentally the degree of communicator-credibility and communication-discrepancy, thereby investigating the main and interaction effects of these two variables on opinion change: that is, what would happen if these isolated variables are put together in one experimental setting, and what would be their interaction in this situation.

The studies on communicator-credibility in opinion change indicate, in general, that the more credible the communication source the greater is the opinion change toward the communication advocated. Thus, Hovland and Weiss (15) found that opinion change in the direction advocated by the communication, occurred significantly more often when it originated from a

high-credible source than when from a low one, with three of the four topics they used. Kelman and Hovland (16), using the topic of treatment of juvenile delinquents, also found that the group hearing the communication from the positive source changed their opinions toward the communication more than did those hearing it from the negative source. Hovland and Mandell's study (13) showed the same trend with the topic of devaluation of currency, but the difference between the credible and non-credible groups was not statistically significant. Fine (4), however, using the topic of biological warfare, found almost negligible difference between the credible and non-credible groups.

Opinion change is also a function of the discrepancy between the communicator's opinion position and the recipient's initial opinion position on a given issue. This discrepancy is referred to as the communication-discrepancy in the present study. In general, there is a positive relationship between such discrepancy and opinion change of the recipient. This means: the greater the communication-discrepancy the greater the opinion change that is produced. Ewing (2) observed this phenomenon by using an unknown or ambiguous communicator, and the topic of attitude toward Henry Ford. Sims (20) reported that, when the communication was favorable to the Tennessee Valley Authority, the more unfavorable the initial opinion the greater the change produced. In these two studies, no effort was made to control the possible artifacts, "ceiling"

and "regression" effects. However, the generalizations are still valid even after these artifacts are controlled. Thus, Goldberg (6), manipulating the communication-discrepancy independent of the subject's initial position on evaluating Negro intelligence from photographs, observed the greater conformity to the group norm as the communication-discrepancy increased. Hovland and Pritzker (17) also manipulated experimentally the amount of change in such a way that the amount of change could be independent of subjects' initial positions, and thus confirmed the above generalization. They used authoritative communicator and factual topics such as electricity produced by atomic power, compulsory voting in presidential elections, etc. Similar results were reported by Fisher and Lubin (5) in their study of a two-person situation requiring judgments of number of paratroopers seen in briefly exposed photographs, although a tendency of decreasing change with extremely large discrepancy was noted.

However, the study made by Hovland, Harvey & Sherif (10) suggests that when the issue is very important to the subjects, there is a negative relationship between the communication-discrepancy and opinion change. From the well established phenomena of the contrast and assimilation effects in psychophysics, and from the Sherif, Taub & Hovland study (21) using a weight lifting experiment, Hovland, Harvey & Sherif (10) argued that if the subjects have established an attitude on an issue and the issue is personally important,

their initial opinion positions would function as the anchor-
age, affecting reaction to and evaluation of the communication
given. They hypothesized that the communication near the sub-
ject's initial position would be assimilated to it, while the
communication which discrepant from the subject's initial po-
sition would be displaced further away (contrast effect).
Using the topic of prohibition of alcohol in two dry States,
with a neutral or anonymous communicator, they generally con-
firmed these hypotheses. That is, on the perception of the
communication, there was a tendency for individuals whose po-
sition was closer to the communicator's position, to report
his position to be substantially more like their own (assim-
ilation effect); and for those with a more discrepant po-
sition to report the communicator's position as more extreme
than it really was (contrast effect). On the actual reaction,
less opinion change was observed when the communication-
discrepancy was large (a tendency of contrast effect) than
when the discrepancy was small. It must be noted, however,
that the subjects who were strongly for or against prohi-
bition might have different characteristics from those of the
people who are in the middle of the road on the issue. Also,
mechanisms other than the effect of discrepancy seem to be
operating when the subjects are exposed to an extremely dis-
crepant communication. Especially when the communicator is
ambiguous, as in this study, subjects can easily discredit
the communicator as unfair or biased, hence resist change.

Zimbardo (23) on the other hand, manipulated "involvement" using a comparatively neutral issue and a highly credible communicator (close friend), and observed the familiar positive relationship between the communication-discrepancy and opinion change. As he indicated in his paper, the involvement he manipulated was, however, not the "issue-involvement" as in the above studies, but a "response-involvement" where instrumental meaning was attached to the outcome of the subject's responses rather than to the issue.

In the present study the communicator-credibility and the communication-discrepancy between the stand advocated in the communication and the stand of the recipient are experimentally varied, in order to investigate the main as well as the interaction effects of these two variables on opinion change.

The credibility of the communicator has at least two attributes: expertness and trustworthiness of the communicator. Expertness has been defined as "the extent to which a communicator is perceived to be a source of valid assertions," and trustworthiness as "the degree of confidence in the communicator's intent to communicate the assertion he considers most valid" (11, p. 21). The communicator-credibility in the present study is manipulated as an independent variable. Also an effort was made to differentiate trustworthiness from expertness by means of separate ratings on these two attributes by the subjects.

Another independent variable, communication-discrepancy, was experimentally manipulated by introducing "anchor statements" at the beginning of the communication. It is assumed that this "end anchor" would affect the subject's judgment of the communicator's position in the direction of being less extreme than without this anchor. From the model of judgmental process formulated by Helson (8) that all judgments are made with respect to a frame of reference, we can say that any judgment including expression of opinion on an issue is a function of the relationship between some standard or anchor stimulus and the stimulus which would be judged by others who had not experienced the standard. For instance, when an extremely heavy stimulus is introduced, the other stimuli are judged as lighter than when without this stimulus. Similar anchor effect was also observed in more complex social judgmental process. For example, when Weiss presented subjects with an extreme anchoring statement they judged the communicator's position as less extreme than otherwise (22).

The topic of the present study is based on the issue concerning the causal relationship between cigarette smoking and lung cancer. Therefore, it is an issue-involvement according to Zimbardo's classification. The degree of importance of the topic was not varied experimentally, but checked by means of ratings on importance of the topic to the subject, and was given close attention in connection with the above two main

variables.

On the basis of the works reviewed above, it is hypothesized with reference to the two main variables, communicator-credibility and communication-discrepancy, that:

(1) Greater extent of opinion change toward the communication advocated is expected when the communicator is high-credible rather than low-credible.

(2) Greater extent of opinion change toward the communication advocated is expected when the communication-discrepancy is large rather than small.

(3) When the communicator is high-credible, greater extent of opinion change toward the communication advocated is expected for large-discrepancy groups rather than for small-discrepancy groups.

When the communicator-credibility is low, the prediction can be made in either direction depending upon the particular experimental conditions; i.e., the extent of opinion change toward the communication advocated may be greater for large-discrepancy groups than for small discrepancy groups, or vice versa. The results of the Hovland, Harvey & Sherif study (10) appear to indicate that, under conditions when the communicator is ambiguous and the issue is very important to the subject, the greater the discrepancy the higher the resistance. On the other hand, with highly credible communicators as in the study by Hovland and Pritzker (14), using issues of low importance, the greater the discrepancy the greater the effect.

Method

In order to test the above hypotheses, a before-after design involving four experimental and four control groups was employed. The overall design of the study was to present communications which were identical except for the two experimental variables: high- and low- credibility of the source of the communication, and the large- and small- discrepancy manipulated by the anchor statements. One half of the experimental subjects read a version of the article in which the source is attributed to a high-credible communicator, and the other half read a version which was attributed to a low-credible communicator. Also, for one half of each group, a few additional anchor statements, to the effect some people hold to the opinion extremes on the issue, were inserted in the beginning paragraph of the communication. Then the communicator presented his own opinion which was identical, and was read by the other half of the experimental groups.

Opinion positions on the issue discussed in the communication were measured before the communication and again after the communication. In addition to these opinion positions, ratings on a series of judgmental items were included in order to obtain measures on the experimental variables, and other relevant information.

The issue referred to the causal relationship between cigarette smoking and lung cancer.

The control group, which corresponded to the above

mentioned experimental groups in every respect except the communication effect, gave their opinions before reading the communication, and then made the same judgments of the communication as did the experimental subjects. Thus, eight different treatments were required.

Subjects

The subjects who were exposed to both sessions were 216 undergraduates from Boston University (98 Freshmen, 34 Sophomores, 57 Juniors, and 27 Seniors), who came from the four different schools: School of Fine and Applied Arts (N=102), School of Public Relations and Communication (N=65), College of Liberal Arts (N=29), and College of Business Administration (N=20). The subjects from each school were proportionally assigned to the experimental (N=149) and control (N=67) groups by approximately a 2 to 1 ratio.

Procedure

1. Before-Session: The questionnaire booklet (Appendix B) was presented to the subjects in a group as an opinion survey on current social issues, sponsored by the Human Relations Center of Boston University. It was administered by a staff member of the Center who was assisted by the instructor of the class concerned and by another member of the Center.

The questionnaire consisted of three parts: subject's own opinion, importance of the topic to the subject, and the credibility of the source as a communicator of the topic.

In the first part of the questionnaire the subjects were asked to indicate their opinion on the statement "Cigarette smoking is one of the causes of lung cancer." This measure was taken as the subject's initial opinion position on the topic. There were six filler statements which were on the problems of radioactivity fallout, capital punishment, Communist China, juvenile delinquency, and communism vs. capitalism. Each statement was rated on an eleven-point graphic scale which ranged from 0 (complete disagreement) through 5 (uncertain or in doubt) to 10 (complete agreement). In this part the subjects were also asked to rate the statement "People who smoke cigarettes are more likely to have lung cancer later in life than are people who do not smoke." As the communication concentrates its arguments exclusively on the causal relationship this measure was not taken as their initial opinion position in the following analysis.

In the second part of the questionnaire the subjects rated the importance to themselves of the topic on cigarette smoking and lung cancer, along with five other filler topics mentioned above. The scale had eleven points, from "not important at all to me" (0), through "moderately important to me" (50), to "extremely important to me" (100).

In the third part of the questionnaire the subjects rated each of the six names, persons, or organizations in terms of their expertness and trustworthiness as a source of information on the topic of cigarette smoking and lung cancer.

The scale for expertness, which was defined for the subjects as "the amount of knowledge the communication source has on the topic concerned," had five points on a descriptive rather than a graphic scale. The descriptions of likelihood of knowledge ranged from almost nothing about the topic, only a few facts, some of the facts, most of the facts, and all the facts. The trustworthiness of a source referred to its being a fair and unbiased communicator of the facts, and the scale ranged from "not trustworthy at all" (0), through "moderately trustworthy" (50), to "extremely trustworthy" (100).

The communication sources rated for the present topic were: "your parent," "American Tobacco Company," "Director of the Tobacco Industry Public Relations Committee," "Head of the National Cancer Institute," "Internal Revenue Service, U.S. Treasury Dept.," and "Public Health Service." The similar ratings on communication sources were requested for each of the other three filler topics: communism vs. capitalism, radio-activity fallout, and juvenile delinquency.

Subject's name, age, sex, major, and class were asked for at the end of the questionnaire on a separate sheet.

The data of the before-session were gathered between Nov. 9, and Nov. 23, 1959.

2. After-Session: In this session the subjects were assigned randomly to either experimental or control groups by approximately a 2 to 1 ratio. That is, the number of the experimental group was twice that of the control group.

The experimental group was divided randomly into four sub-groups according to the two main experimental variables, communicator-credibility and communication-discrepancy: High-Credibility with Large-Discrepancy (HC-LD), High-Credibility with Small-Discrepancy (HC-SD), Low-Credibility with Large-Discrepancy (LC-LD) , and Low-Credibility with Small-Discrepancy (LC-SD). They were given the communication which advocates the idea that there is no causal relationship between cigarette smoking and lung cancer. The effect of communication was assessed immediately after these experimental subjects were exposed to the communication, by asking them to indicate their opinion positions on the same statement used at the before-session.

The four control groups which correspond to the four experimental groups indicated their opinion positions on the same statement without being exposed to the communication. For the control groups, it was also worthwhile to have all the measures taken for the experimental group other than that of communication effect, in order to obtain a sound base line for assessing the opinion change. Moreover, it was desirable to make the time required for the task approximately the same for the experimental and control groups since both groups responded in the same class room. Therefore, the control groups were requested to read the same communication after they indicated their opinion position on the statement. They also responded to the items about: the communicator and com-

munication, their smoking habits, and the fact-quiz items, as the experimental group did. By this procedure, the control groups could be compared with experimental groups in every respect except that of the communication effect. The communication had no effect on opinion change for the control group since they gave their opinions before they read the communication.

Thus, there were altogether eight different treatments. The questionnaire booklets (Appendix C) covering the above eight treatments, were arranged in a random order using a table of random numbers with the ratio mentioned above; and were handed out to the subjects in this prearranged order.

The after-session was held two to four weeks after the before-session, i.e., between Dec. 11 and Dec. 16, 1959. An effort was made to prevent the subjects from associating this session with the before-session. The subjects were told that this was a study by the Department of Psychology of Boston University, and was to investigate how people evaluate opinions of others, how they recall some of the points made in the communication, etc. This session was administered by different persons from the before-session with exception of the instructor of the class.

To prevent the control group from looking over the communication before they gave their opinions, and to obtain accurate recall scores for both experimental and control groups, the following special instruction was added to the general

instruction.

"When we hand out the booklets, take one from the top, and pass the rest to the next person, and do not open it until you are told to do so.

As you go along to rate the scale or answer the questions, please do not go back to the earlier part of the questionnaire although you might change your mind or do not recall some of the facts.

The reason we want you to follow these two rules is to insure the randomness of the response, that is, each booklet contains essentially the same content but with different orders of questions, and those booklets are in turn arranged in random order.

So, please follow the instruction carefully."

For the experimental group the after-measurements were given immediately after the subjects read the communication. The conditions of the control group were exactly the same except that they gave their opinions on cigarette smoking and lung cancer, and indicated the importance of the topic, before the communication.

The measurements covered in this session were those of: communicator's position, trustworthiness of the communicator, fairness of the article, subjects' own opinion position, importance of the topic, recall of the content, and smoking habit.

The first part of the after-measures included the items on the evaluation of the communicator's position, trustworthiness of the communicator, and the fairness of the article.

The subjects' judgments of the communicator's position were obtained by the ratings made on the statement: "Cigarette smoking is one of the causes of lung cancer." The

eleven-point graphic scale was used with values ranging from "complete rejection" (0), through "uncertain or in doubt" (5) to "complete acceptance" (10) of the above statement. The subjects were also asked to judge the communicator's position on the statement: "Cigarette smoking is statistically associated with lung cancer." This was not, however, taken for the measure of discrepancy because the communication advocated the idea that there is no causal relationship between cigarette smoking and lung cancer.

The measure of the communicator's trustworthiness was the same as in the before-measures except that the range of the scale was 0 to 10 instead of 0 to 100 used in the before-measure. The fairness of the article was obtained from the subjects' ratings in terms of how they thought about the article, that is, as fair or one-sided. The scale ranged from "completely one-sided" (0), through "moderately fair" (5), to "completely fair" (10).

The second part of the after-measure was concerned with the subjects' own opinion position and with the importance of the topic to them. To obtain the subject's own opinion score, the same opinion statement which was used in the before-measure ("Cigarette smoking is one of the causes of lung cancer") was given again, and the subjects were asked to indicate their positions on the same eleven-point scale. Subjects also gave their opinions on the statement: "People who smoke cigarettes are more likely to have lung cancer later in life than are

people who do not smoke." This measure was not taken for the main analysis, however, for the reason presented above. The degree of importance of the topic to the subjects was also rated on the eleven-point scale as in the before-measure (0 to 10 instead of 0 to 100).

In part three, five multiple-choice fact-quiz items based on the content of the communication were given to determine their recall score, or learning. In part four the information about smoking habits was obtained by asking whether they smoked, did not smoke, smoked before but stopped, and inquiring about the number of cigarettes they smoke or smoked in a day. Personal data such as subject's name, major, year were asked on a separate sheet at the end.

Variables

1. Communication: The communication (Appendix C) was prepared by the writer utilizing various publications on the problem of smoking and lung cancer. The main idea emphasized was that there is no causal relationship between cigarette smoking and lung cancer. More specifically, it was admitted in the beginning of the article that there is some evidence from the statistical correlations, which admits a link between smoking and lung cancer. It was argued, however, that the statistical correlation is not proof of a causal relationship, and that the factual and experimental evidences are all against the notion of causal relationship. After introducing a number of examples of experimental and observational data

in support of the argument the writer concluded that there are significantly more sound experimental results which would cause one to reject rather than to accept the notion that smoking is a cause of lung cancer. This position of the communication was advisable also because an examination of the initial position taken by the subjects in the before-measures indicated that they held ideas which were predominantly in the direction of agreement with the statement that there is a causal relationship between smoking and lung cancer.

2. Communicator-Credibility: The results of the before-measures showed that "Head of the National Cancer Institute," and "Public Health Service" were rated as very high in trustworthiness (means: 86.40 and 83.42, respectively). On the other hand, "American Tobacco Company," and "Director of Tobacco Industry Public Relations Committee" were rated considerably lower in the trustworthiness (means: 29.83 and 39.22, respectively). In rating the communicator's expertness, these four sources were in the category of "the source likely to know most of the facts". Therefore, it was decided to use "Dr. W. C. Hueper, Head of the Environmental Cancer Section of the National Cancer Institute, Public Health Service" as high-credible communicator, and "Mr. J. P. Richards, Director of the Tobacco Industry Public Relations Committee which includes American Tobacco Co., R. J. Reynolds, Liggett & Meyers, Brown Williamson" as the low-credible source. At the beginning of the communication it was indicated that the article was

delivered as a speech by the author specified. The author's name and title were repeated at the top of each of the six pages of the communication.

3. Communication-Discrepancy: McGarvey (17) demonstrated the effect of anchor stimuli on complex judgmental phenomena, taking the suggestion from psychophysical experimentation. Weiss (22), in his recent study, also demonstrated that the communication of punitive policy toward delinquents is judged less punitive with the addition of a few introductory statements to the effect that some people hold to the opinion extremes of complete leniency or excessive punitiveness toward delinquency more than without these statements. One of the present experimental groups was given an end anchor statements in the expectation that it would effect the subjects to judge the communication as less extreme than they would without this anchor. Accordingly, the group with this anchor would be, on the whole, less discrepant from the communicator's position than the group without these statements. The group with the anchor was, therefore, called as "small-discrepancy" group, and the group without this anchor was called as "large-discrepancy" group.

The anchor statements were given as:

"Some hold the extreme belief that cigarette smoking is unquestionably a cause of lung cancer and that if you smoke cigarettes you will eventually have lung cancer. Others hold to the extreme opposite belief that cigarette smoking bears no relationship whether or not a person will have lung cancer."

This was inserted as a part of the speech at the beginning of

the article.

Results

The results are presented in three sections: (1) the effectiveness of the main experimental variables; (2) the effect of main variables on opinion change; and (3) the effect of other related variables on opinion change.

The Effectiveness of the Main Experimental Variables

1. Communicator-Credibility: Dr. W. G. Hueper of the National Cancer Institute, who was chosen as a high-credible communicator, was rated by the subjects as more trustworthy than the low-credible communicator, Mr. J. P. Richards of the Tobacco Industry Public Relations Committee, on the topic of cigarette smoking and lung cancer. The mean ratings for the high- and low-credible communicators are 7.94 and 5.10, respectively, and this difference is significant ($p < .0005^1$). If the overall median ratings on trustworthiness by the entire experimental group are taken as a reference, 81 per cent of the high-credible group judged Dr. Hueper above the median, while only 35 per cent of the low-credible group judged Mr. Richards above this median.

In support of the above results, the article attributed to Dr. Hueper was judged as more fair than was the one attributed to Mr. Richards, although the same communication was given to the two groups. The mean ratings on the fairness of

1. In the following analyses, all p values are tested by t, and one-tailed, unless otherwise specified.

the article by high-credible and low-credible groups are 7.15 and 4.41, respectively, and this difference is significant ($p < .0005$).

Therefore, it is justified to use the groups which read the communication supposedly delivered by Dr. Hueper of the National Cancer Institute as the High-Credible group, and those who received the communication from Mr. Richards of the Tobacco Industry Public Relations Committee as the Low-Credible group.

It is noted that mean ratings on trustworthiness for Mr. Richards with his title (5.10) is higher than that of the low-credible sources rated in the before-measures (means²: 2.85 for American Tobacco Company, and 3.99 for Director of Tobacco Industry Public Relations Committee). On the other hand, a slightly lower mean rating for Dr. Hueper (7.94) with the given title than results from the two high-credible sources rated at the before-session (means³: 8.21 for Head of the National Cancer Institute and 8.67 for the Public Health Service) is observed. Although the mean ratings on trustworthiness of the communicator at the after-session are not directly comparable with those of the before-sessions, because of the addition of the name of a specific person, and of changes or additions

2, 3. Before-session means are converted into 0 - 10 point scale from 0 - 100 for easy comparisons. Both scales have 11 points where no in-between judgment within a point is permitted.

in the wording of the organizations which they represent, the above phenomena may be due to the regression effect: i.e., both high and low trustworthiness showed a tendency to regress toward the mean in the after-measures. This regression effect, however, cannot be estimated since no adequate base line was available. Consequently, the effect of communication on the ratings on trustworthiness is difficult to assess.

2. Communication-Discrepancy: Communication-discrepancy was manipulated by the introduction of "anchor statements" as mentioned before. Contrary to the expectation, the rating of the communicator's position made by the group with anchor statements was not proved to be less extreme than the ratings given by the group without this anchor (means: 3.06 and 3.43, respectively.) Accordingly no difference between these two groups in their subsequent opinion change was expected. The mean change score for the group with anchor statements was 1.27 and that of the group without this anchor was 1.29. Consequently, this discrepancy variable related to the anchor statements was not used.

Instead, the communication-discrepancy of the present study was derived from the subjects' ratings on the communicator's position. The subjects were divided into two groups according to the median of all their judgments on the communicator's position (3.18). All the subjects' ratings of their own initial opinion position yielded a mean of 7.13. The below-median groups' judgments of communicator's position

yielded a mean of 1.54, whereas the above-median group yielded a mean of 5.22. The below-median group was more discrepant (7.10 - 1.54, or 5.56 points on the scale), than was the above-median group (7.16 - 5.22, or 1.94 points), from their own mean initial positions. The difference between these two mean discrepancies for the below- and above-median groups (5.56 - 1.94, or 3.62 points on the scale) is statistically significant ($p < .01$). Therefore, the former, or below-median group, is called the Large-Discrepancy group, and the latter, or above-median group, is called the Small-Discrepancy group.

In order to justify the use of this derived communication-discrepancy as a proper variable for further analysis, however, the following considerations have to be made. If there is a significant positive correlation between the subjects' initial positions and their judged communicator's position, one cannot use the difference between the two positions as the discrepancy variable, because it is confounded with the subject's initial position. On the other hand, if we find a negative correlation, as we could properly expect from the experimental evidence of "contrast" and "assimilation" effects in perceiving communication (14), the ceiling and regression effects would remain in the situation. That is, the negative correlation means that the individuals whose position is less discrepant from that of the communicator tend to judge the communicator's position as less extreme, while those with more

discrepant position tend to judge communicator's position as more extreme than it really is. Under these circumstances, a large discrepancy group is likely to regress toward the mean score of the population at the after-session without any communication effect resulting in spurious increase in the extent of opinion change toward the idea of the communication. On the other hand, a small-discrepancy group may regress toward the mean at the after-session counteracting the positive opinion change. This regression effect, together with the smaller initial distance to move (ceiling effect), would spuriously minimize the opinion change for this group.

To check these possible artifacts, the correlation between the subjects' initial opinion position and the communicator's position judged by the subjects was computed, and found to be negligible ($r = .04$, $X^2 = .00$). Furthermore, the mean initial positions of the small- and large- discrepancy groups are almost the same (7.10 and 7.16, respectively). Accordingly, the artifacts, which could arise if we take simply the above- and below- median groups on the basis of their initial position as a discrepancy measure, are well under control in the derivation of this discrepancy variable. Accordingly, this derived communication-discrepancy variable, based upon the judgment of the communicator's position by the subjects, is used in the following analysis in place of the original variable with the anchor statements.

A few words on the use of the control group is in order.

As noted before, there were four control groups which corresponded to the four experimental groups. The control groups received exactly the same treatment as the experimental groups, except that the former groups gave their opinions before they read the communication. This procedure was to insure comparability between experimental and control groups in every possible respect measured except the communication effect.

When one of the variables, the communication-discrepancy used in the present analysis, is not experimentally manipulated but derived from the subjects' judgments on the communicator's position, after the experiment, comparability between experimental and control groups is the especially important presumption. If there are no significant differences between the experimental and the control groups in every possible respect measured, one is in the strong position to justify the use of the derived discrepancy variable. In order to check comparability, the control groups were compared with the experimental groups with respect to the subjects' (1) initial opinion position, (2) ratings on the importance of the topic, (3) judgment of communicator's position, (4) ratings on the trustworthiness of the communicator, (5) ratings on fairness of the article, and (6) recall scores (See Table 11 in Appendix A). No single significant difference was found between the two groups for the six comparisons made.

In the assessment of opinion change all control groups are combined, and this combined control group serves as the

base line for comparison with the experimental groups. This procedure is based on the assumption that control groups are homogeneous among themselves, for no significant differences among the control sub-groups were found in the measures obtained in this study. Direct one-to-one sub-group comparisons between experimental and control groups, however, were made whenever necessary.

Communication Effect as a Function of Communicator-Credibility and Communication-Discrepancy

Communication effect is assessed by the change score. The change score is the difference between the before- and after- measures in the opinion scores obtained by the rating scale. Positive change score indicates the movement toward the communicator's position, i.e., toward the position that there is no causal relationship between cigarette smoking and lung cancer. Negative change signifies the movement away from the position advocated by the communicator.

The mean opinion changes for the experimental groups and for the control⁴ group are presented in Table 1; and the analysis of variance applied to the 2x2 table of two main variables, communicator-credibility and communication-discrepancy, is presented in Table 2. As noted before, there was no significant difference between the experimental and control groups

4. In the following pages, the control group refers to the combined control group as a whole, unless otherwise specified.

Table 1

Mean Opinion Change for Each Experimental
Sub-Group and the Control Group

	Control Group	High-Credibility		Low-Credibility	
		Large- Discrep.	Small- Discrep.	Large- Discrep.	Small- Discrep.
N	67	38	40	42	29
Mean	0.28	2.16**	1.13	1.21	0.45
SD	2.73	2.31	1.95	3.09	2.39
Diff.		1.03		0.76	

** Significant at .01 level.

Table 2

Analysis of Variance of Change Scores for
Experimental Groups with Credibility
and Discrepancy as the Variables

Source	s.s.	df	m.s.	F	p
Credibility (C)	19.63	1	19.63	3.14	.10 > p > .05
Discrepancy (D)	25.02	1	25.02	4.00	< .05
Interaction: CxD	5.85	1	5.85	-	-
Within	907.66	145	6.25		
Total	958.16	148			

in their initial opinion positions (means: 7.13 and 7.04, respectively).

The group which was exposed to the communication (experimental group as a whole) shows significantly greater extent of opinion change toward the communication advocated than does the group which was not exposed to it (control group) ($p < .01$).

The difference between the High- and Low- Credibility groups within the experimental group is significant by t test ($p < .05$). The group who received the communication which attributed to the High-Credible source (Dr. Hueper of the Cancer Institute, Public Health Service) changed more toward the communication advocated, than did the group which read the communication from Low-Credible source (Mr. Richards of Tobacco Industry Public Relations Committee). Also, the difference between the Large- and Small- Discrepancy groups is significant by t test ($p < .025$). Thus, those who judged the communicator's position as more discrepant from their own stand, changed more toward the communication than did those who judged it as less discrepant. The interaction effect between these two main variables, communicator-credibility and communication-discrepancy, is not significant. That is, within high- and low- credible groups, both large-discrepancy groups changed more toward the communication advocated than did the small-discrepancy groups.

When the experimental groups are compared with the control group, it is noted that overall High-Credible group shows significantly greater extent of opinion change toward the communication than the control group ($p < .0005$). Similarly, only the overall Large-Discrepancy group has significantly higher mean change score toward the communication than does the control group ($p < .005$). Both overall Low-Credible and overall Small-Discrepancy groups have higher mean change scores than does the control group, but these differences are not quite significant ($.10 > p > .05$ for both groups).

Second order comparisons show no significant interaction. Although all four sub-groups show greater mean opinion changes than the control group shows, only the HC-LD group is significantly changed more toward the communication.

When each of the sub-group means within the experimental group (means: 1.63 for HC- and 0.90 for LC- group) is compared with that of its own corresponding control group, the same conclusion can be derived, since the sub-group means within the control group are not significantly different from each other (means: 0.39 for HC- and 0.18 for LC- group). Similar comparisons between experimental LD- and control LD- group (means: 1.66 and 0.51, respectively), and between experimental SD- and control SD- group (means: 0.84 and 0.00) were made, and showed the same trend as the above, except the fact that the difference in the latter comparison became significant ($p < .05$). The difference between two sub-group means within

the control group is, however, not significant.

The data were also analyzed by the net proportion of change⁵, and the results are presented in Table 12, Appendix A. On the whole, the same conclusions were derived as from the change score presented above, although some changes in the significant level of differences were observed.

The communication effect was also assessed by another discrepancy measure, the distance between subject's initial position and the communicator's position as judged by the subject. Both High- and Low- Credibility groups were divided into two groups (by median dichotomization, median, 4.06) according to this discrepancy score. The above-median group is called Large-Discrepancy group, and the below-median group is called Small-Discrepancy group. Table 13 in Appendix A summarizes these results. The analysis of variance made on these two main variables is presented in Table 14 in Appendix A.

One can draw essentially the same conclusions derived above, except that the difference between Large- and Small-Discrepancy groups in opinion change became much more significant ($p < .0005$). It is noted, however, this change comes in part from the fact that discrepancy is confounded with the

5. The net proportion of change is defined by Hovland, Lumsdaine & Sheffield (12), as the difference between proportion of positive change and proportion of negative change. Positive change in the present analysis is the movement toward the communicator's position advocated, and the negative change signifies the movement away from it.

subject's initial position. It is shown that majority of the Large-Discrepancy group come from the above-median group on their initial position, while those whose initial positions are below the median form the Small-Discrepancy group. Thus, the relationship between the subject's initial position and this discrepancy measure is found to be significant ($X^2=48.56$, $df=1$, $p<.01$).

Communication Effect Related to Other Variables

The importance of the topic, smoking habits, fairness of the article, and the learning from the communication, which were included in the after measures, may have had some effects in producing opinion change, and these effects are examined in the following section.

1. Importance of the Topic: The experimental group was dichotomized according to the median⁶ of the ratings on the importance of the topic (median, 7.05). The above- and below-median groups are called High-Importance and Low-Importance groups, respectively. The initial opinion positions of these two groups were not significantly different from each other

6. This is the median of after measures on importance of the topic. Since there are little change in the ratings on the importance of the topic from before- to after- communication (means: 6.11 and 6.23, respectively) which measure is used for dichotomization did not make any difference in assessing the opinion change. Also, the control group rated the importance of the topic before they were exposed to the communication. The after-mean of the experimental group can be compared with the control mean (6.43) and showed this difference to be negligible.

(means: 7.16 for High-Importance, and 7.05 for Low-Importance groups, respectively).

The mean opinion change for High- and Low- Importance groups of both experimental and control groups are shown in Table 3, and the analysis of variance of change scores for High- vs. Low- Importance and Experimental vs. Control groups is presented in Table 4.

It is found that the Low-Importance group changed significantly more toward the communication advocated, than did the High-Importance group ($p < .01$). It is also noted that only the Low-Importance group has significantly higher mean change score than its corresponding control Low-Importance group ($p < .05$).

2. Smoking Habits: The subjects were divided into three categories according to their smoking habits: the Non-Smokers (including 12 people who smoked before but stopped), the Light-Smokers who smoke less than 15 cigarettes in a day, and the Heavy-Smokers who smoke 15 or more cigarettes per day.

The mean opinion change of Non-, Light-, and Heavy-Smokers in both experimental and control groups, are presented in Table 5. Table 6 shows the analysis of variance of change scores for groups with different smoking habits and for Experimental vs. Control groups.

There are no significant differences among these three groups in their opinion changes. When each sub-group mean within the experimental group is compared with its corresponding

Table 3

Mean Opinion Change for High-
and Low- Importance Groups

	Experimental Group		Control Group	
	High- Importance	Low- Importance	High- Importance	Low- Importance
N	74	75	34	33
Mean	0.80	1.76*	-0.03	0.61
SD	2.62	2.35	2.69	2.73
Diff.	0.96**		0.64	

* Significant at .05 level.

** Significant at .01 level.

Table 4

Analysis of Variance of Change Scores for
High- vs. Low- Importance and for
Experimental vs. Control Groups

Source	s.s.	df	m.s.	F	p
Importance (I)	40.91	1	40.91	6.13	<.01
Exp. vs. Control (EC)	46.06	1	46.06	6.91	<.01
Interaction: I x EC	0.59	1	0.59	-	-
Within	<u>1,414.27</u>	<u>212</u>	6.67		
Total	<u>1,501.83</u>	<u>215</u>			

Table 5

Mean Opinion Change for Non-
Light-, and Heavy- Smokers

	Experimental Group		
	Non-Smokers	Light-Smokers	Heavy-Smokers
N	65	33	47
Mean	1.43**	1.58*	0.74
SD	2.42	2.39	2.71
Diff.	0.15		0.84
Diff. Non - Heavy	0.69		

	Control Group		
	Non-Smokers	Light-Smokers	Heavy-Smokers
N	32	17	15
Mean	-0.19	0.65	0.60
SD	2.79	2.37	3.01
Diff.	0.84		0.05
Diff. Non - Heavy	0.79		

* Significant at .05 level.

** Significant at .01 level.

Total N does not correspond to 216 due to 7 subjects' failure to respond to this question.

Table 6

Analysis of Variance of Change Scores for
Groups with Different Smoking Habits, and
for Experimental vs. Control Groups

Source	s.s.	df	m.s.	F	p
Smoking Habits (S)	9.42	2	4.71	-	-
Exp. vs. Control (EC)	47.29	1	47.29	6.89	<.01
Interaction: S x EC	17.92	2	8.96	1.31	-
Within	<u>1,393.29</u>	<u>203</u>	6.86		
Total	1,467.92	208			

control sub-group mean, however, Non- and Light- Smokers show significantly higher mean change scores toward the communication than did the control groups ($p < .01$, $p < .05$, respectively); while Heavy-Smokers do not differ from the control group significantly.

There were significant differences in their initial opinion positions among these three groups ($p < .05$ by F). Individual t test shows that, Non- and Light- Smokers do not differ in their initial positions (means: 7.66 and 7.24, respectively). Heavy-Smokers, however, (mean, 6.19) are significantly lower than Non-Smokers in their initial position ($p < .05$), and are also considerably but not significantly lower than Light-Smokers ($.10 > p > .05$).

No significant relationship between subjects' smoking habits and the judgment of communicator's position is found ($X^2 = 0.88$). There is a considerable degree of positive relationship between the smoking habits and the subject's judgment on importance of the topic ($X^2 = 18.30$, $df = 2$, $p < .01$; $G = 0.35$): i.e., Heavy-Smokers judged the topic as more important while the Non- and Light- Smokers judged it as less important to them.

3. Fairness of the Communication: All groups were dichotomized by the median rating of the fairness judged by the subjects (median, 5.74); and the mean opinion changes for High- and Low- Fairness groups in both experimental and control groups are shown in Table 7. Table 8 presents the analysis of

Table 7

Mean Opinion Change for High-
and Low- Fairness Groups

	Experimental Group		Control Group	
	High-Fairness	Low-Fairness	High-Fairness	Low-Fairness
N	77	72	33	34
Mean	1.69**	0.85	0.36	0.21
SD	2.62	2.37	2.12	3.20
Diff.	0.84*		0.15	

* Significant at .05 level.

** Significant at .01 level.

Table 8

Analysis of Variance of Change Scores
for High- vs. Low- Fairness and for
Experimental vs. Control Groups

Source	s.s.	df	m.s.	F	p
Fairness (F)	22.76	1	22.76	3.38	-
Exp. vs. Control (EC)	46.06	1	46.06	6.83	<.01
Interaction: F x EC	3.97	1	3.97	-	-
Within	1,429.04	212	6.74		
Total	1,501.83	215			

variance of change scores for High- vs. Low- Fairness groups and Experimental vs. Control groups.

It is shown that the High-Fairness group changed significantly more toward the communication than did Low-Fairness group ($p < .05$). Thus, when the High- and Low- Fairness groups within the experimental group are compared with their corresponding control sub-groups, only the High-Fairness group shows significantly greater mean change than that of the control group.

As the correlation between the credibility and the fairness judged by the subjects is high ($X^2=25.97$, $df=1$, $p < .01$; $C = .39$) the above result could be regarded as a confounding. In order to partial out the credibility effect in the present comparison, the median of the High-Credibility and Low-Credibility groups were calculated separately (7.94 and 4.13, respectively), and the subjects in each of the High- and Low-Credibility groups were divided into two sub-groups according to their own medians. Within the High-Credible group no significant difference between the above- and below- median groups was found in their opinion change (means: 1.55 and 1.74, respectively). Within the Low-Credible group, the above-median group shows more opinion change than the below-median group (means: 1.42 and 0.50, respectively), but this difference also does not quite reach statistical significance ($.10 > p > .05$). Therefore, the conclusion derived above does not hold after the credibility effect is eliminated.

4. Learning of the Content of the Communication: The learning score is obtained from the five multiple-choice items in the after-questionnaire. The median score of the entire group is 3.54 (theoretical range: 0 - 5). Table 9 summarizes the mean opinion change for High- and Low- Learning groups in both the experimental and control groups. The analysis of variance of the change scores for High- vs. Low- Learning groups and for Experimental vs. Control groups is presented in Table 10.

It is found that there is no significant difference between High- and Low- Learning groups in their opinion change: that is, both groups changed significantly more toward the communication than did their corresponding control sub-groups ($p < .01$ for both comparisons).

There was no significant difference between High- and Low- Learning groups in their initial opinion positions (means: 7.37 and 6.82, respectively).

Table 9
 Mean Opinion Change for High-
 and Low- Learning Groups

	Experimental Group		Control Group	
	High- Learning	Low- Learning	High- Learning	Low- Learning
N	75	74	37	30
Mean	1.31*	1.26*	0.27	0.30
SD	2.18	2.85	3.20	2.31
Diff.	0.05		0.03	

* Significant at .05 level.

Table 10
 Analysis of Variance of Change Scores
 for High- vs. Low- Learning and for
 Experimental vs. Control Groups

Source	s.s.	df	m.s.	F	p
Learning (L)	0.01	1	0.01	-	-
Exp. vs. Control (EC)	46.06	1	46.06	6.70	<.05
Interaction: L x EC	0.09	1	0.09	-	-
Within	<u>1,455.67</u>	<u>212</u>	6.87		
Total	1,501.83	215			

Discussion

The present results support the hypotheses predicted concerning the effects of communicator-credibility and communication-discrepancy on opinion change. That is, the opinion change toward the communication is facilitated as the credibility and the discrepancy increased. Since these hypotheses were derived from a review of the previous works where these variables were more or less separately treated, rather than from the existing theories, the confirmation also means that the present data are consistent with the results reported by others. The lack of interaction effect between the variables in this study is the main reason for this agreement. The opinion change obtained is, therefore, a simple additive function of the two variables.

Communicator-Credibility

The main attribute of the communicator-credibility which differentiates between the high- and low-credibility groups in the present study, was trustworthiness rather than expertness. In the before-session the trustworthiness and expertness of the communication sources on the topic of smoking and lung cancer were rated separately. The median ratings on expertness of the two low-credible sources (American Tobacco Company and Tobacco Industry Public Relations Committee) and those of the two high-credible sources (Head of the National Cancer Institute and Public Health Service) were all found to be in the same descriptive rating category of "the source that

knows most of the facts on the topic"; whereas the median ratings on trustworthiness of the former two and of the latter two, were significantly different in favor of the latter.

In the after-session Dr. Hueper of the National Cancer Institute was rated as significantly more trustworthy than Mr. Richards of the Tobacco Industry Public Relations Committee. The expertness of these two sources was, however, not rated in this session. It is possible that the expertness ratings between the before- and after- sessions would not be the same. It is also unlikely, however, that these ratings would be quite different from each other. The conclusion we could best derive from these data is that when both communicators have high expertness, or when expertness is held constant, trustworthiness attribute alone can differentially affect the subjects' opinion change.

This result seems to differ from that of Hovland and Mandell (13) who found a marked effect on judgments of fairness of the article, but little effect on amount of opinion change, where the suspect source differed from the non-suspect one primarily in characteristics of trustworthiness rather than of expertness. In the present study, there were both significant differences in judgment of fairness, and actual opinion change between high- and low- trustworthiness groups.

Hovland, Janis & Kelley (11) indicated that the small effect on opinions may be attributable to a special combination of factors such that the extents of the speech and the

qualification of the speaker (expertness) were more important than his personal motive (trustworthiness). This explanation does not apply for the present study. A systematic study on attributes of communicator-credibility, expertness and trustworthiness, is one of the areas of research which needs further clarification.

As to the process of opinion change due to communicator-credibility, Hovland, Janis & Kelley (11) speculated at what point attitudes toward the sources have their effect in the process of attending to perceiving, interpreting, learning, and believing the content of communication. For the captive audience, like subjects in the present study, who could hardly avoid being exposed to the communication, two of the above possibilities for the different effectiveness of the source-credibility seem to operate in producing opinion change, namely, the learning and acceptance (believing).

All previous studies indicate that there are slight differences in learning whether the communication is presented by high- or low- credible sources. For instance, Hovland and Weiss (15) found no significant difference in the number of fact-quiz items answered correctly immediately after the communication. Similar results are reported by Hovland and Mandell (13) on their study on devaluation of currency. Kelman and Hovland (16) also reported that recall scores for items on the communication at the delayed after-test, were not significantly different for the positive and the negative sources.

The present study confirmed this generalization. That is, there was negligible difference in recall score or learning, between high- and low- credible groups (means: 3.49 and 3.44, respectively). Therefore, acceptance of the communication, rather than learning, seems to be the greater contributing factor in opinion change.

Hovland, Janis & Kelley (11) also explained why this acceptance is likely to be heightened by increasing credibility of the communicator. According to them, the subject accepts the communication which he anticipates to lead to reward, social approval, and avoidance of punishment. These anticipations increase when a communication is presented by a person who is credible rather than non-credible.

How much of the total effect is from the communicator-credibility alone to affect the subjects' opinions still remained undetermined. In other words, the effect of the communication alone is difficult to isolate from that of the added influence of a stated or assumed source.

Several cognitive theorists tried to establish a law about the person and the message he delivers. For instance, Heider's (7) logical analysis of "unit formation and balanced states" suggests that audience tend to maintain the same attitude toward the communicator as toward the assertion he makes. Thus, if the attitude toward the communicator is different from that toward what he communicates, an "unbalanced state" occurs, and this can be resolved by changing the attitudes

toward the communication, toward the communicator, or toward the communicator's role.

Similarly Osgood and Tannenbaum (19) proposed the principle of congruity. They said that "predicted changes in attitude toward both source and concept are based upon the combined operation of a principle of congruity, a principle of susceptibility as a function of polarization, and a principle of resistance due to incredulity for incongruence of message."

In this respect, some data are available on the changes of subjects' ratings on trustworthiness of the communicator from the before- to after- sessions from the present study. As noted before, there was considerable increase in trustworthiness of the low-credible communicator while a slight decrease in trustworthiness was observed for the high-credible communicator. This change might be interpreted as the effect of communication. However, as the sources rated at the before- and after- sessions were not exactly the same, and the regression effect is possible, this change could not be attributed solely to the communication.

Communication-Discrepancy

The generalization that opinion change is a positive function of communication-discrepancy is a quite well documented phenomenon in the sense of its comparative invariability under the diverse experimental conditions and measuring devices. The results of the present study also confirmed this generalization.

A theory of cognitive dissonance proposed by Festinger (3) presents a somewhat general conceptualization of these phenomena. The central assertion of this theory is that a person who holds cognitions about himself or the environment that are inconsistent with each other, experiences dissonance, i.e., psychological tension having drive characteristics. Thus, when the communication advocated is discrepant from the position a person held, the "dissonance" is created and the "tension" to resolve this dissonance is mobilized to produce opinion change toward the communication. This theory is not the only one which deals with "cognitive inconsistency" and its relation to opinion change. It is similar to Heider's cognitive balance, to Osgood and Tannenbaums' principle of congruity, as mentioned before, and to Newcomb's "strain toward preferred states of equilibrium" (18).

Hovland, however, stated in his recent paper (9) that when the communication source is perceived as credible, opinion change increases with increasing discrepancy; but, that when the source is viewed as neutral or ambiguous or negative, then increasing discrepancy may lead to decreasing opinion change.

It appears at first that Hovland made a quite different prediction from the predictions of the above cognitive theorists. If, however, the conditions which Hovland, Harvey & Sherif (10) dealt with are examined, their results are not contradictory to other research findings. That is, when the communicator is ambiguous or neutral and the communicator's position is divergent

in an extreme degree, it seems that mechanisms other than opinion change, namely, the misinterpretation or dissociation, etc., are readily available. Their data on the subjects' ratings on fairness of the communication, can explain this phenomenon: for example, when a communication is directed at the pro-prohibition, nearly all of the subjects who favored prohibition consider it fair and impartial, but only a few per cent of the subjects who opposed to prohibition consider the identical communication fair. Thus, when the communicator is ambiguous, one of the ways of dealing with discrepant positions is to discredit the communicator, considering him unfair and biased.

A similar phenomenon is observed in the present study. Subjects whose initial opinion position is more discrepant from the communicator's position, rated the same article as less fair than those whose stand is less discrepant from the communicator (means: 5.20 and 6.59, respectively); and the difference between these two means is significant ($p < .01$). Further support of this phenomenon is evident in that the small-discrepancy group also rated the communicator as significantly more trustworthy than did the large-discrepancy group ($P < .01$) when both high- and low-credible groups are combined (means: 7.17 and 6.08, respectively). This, incidentally, confirms the data reported by Brehem and Lipsher (1) where they found increasing perceived communicator-trustworthiness as communication-discrepancy decreased.

These same phenomena are interpreted by the above cognitive theorists in a different way, namely, that the psychological tension created by opinion disagreement is reduced by rejection or devaluing of the communication, etc.

The present result seems to be in accordance with the cognitive inconsistency theories mentioned above. On the other hand, the present study failed to indicate the resistance to change or contrast effect with low-credible communicator and large communication-discrepancy, contrary to the Hovland and others' expectation. The contrast effect was not found in the perception of the communicator's position, as negligible correlation between the subjects' initial opinion position and their judgments of communicator's position indicated. These results, however, could be mainly attributed to the high expertness and also comparatively high trustworthiness of the low-credible communicator used in this study. From the before-session data we estimated that low-credible communicator's expertness on the topic was not markedly different from that of high-credible communicator. And, although the former is significantly less trustworthy than the latter, trustworthiness of the low-credible communicator in the after-session (mean, 5.10) is slightly above the middle scale point (moderately trustworthy).

Moreover, the communication used for the present study was written in a logical form with supporting argument, so that it could not be easily demerited. Therefore, Hovland and others'

resistance against the communication or "boomerang effect"; or cognitive theorists' dissociation or devaluation of the communication, is less likely in the present experimental situation. All of the opinion changes with a low-credible communicator in the present study showed positive direction, although they were not significantly different from the changes in the control group.

Importance of the Topic

Another important variable influencing the relationship between opinion change and discrepancy observed in this study, is the importance of the topic. The present results showed that the more important the topic, the less the opinion change.

As the communication advocated that there is no causal relationship between cigarette smoking and lung cancer, the subjects who feel the topic as more important should change more toward the communication than the subjects who feel the topic is less important, since this change would release or lessen their anxiety.

In the discussion on the resistance to change for the issue of prohibition of alcohol, Hovland, Harvey & Sherif (10) explained that the highly involved issue and the established attitude which would serve as an anchor stimulus for the subjects, might be responsible factors. If the subjects in the present study who feel the topic is more important, are assumed to form a stronger attitude than the subjects who feel the topic as less important before they are exposed to the communication,

a comparable explanation to that given above, could be made for the results. The heavy smokers changed their opinions less than the non-smokers and felt the issue as more important to them. This might be a partial support of the notion of established attitude.

Zimbardo (23), on the other hand, observed an increasing opinion change (conformity) as involvement increased with use of a highly credible source. He explained this difference between his result and that of Hovland, Harvey & Sherif (10) by differentiating "issue-involvement," where the issue itself is intrinsically involving, and "response-involvement," where the instrumental meaning of subject's opinion is attached to the consequence of his response. According to this classification the involvement of Hovland, Harvey & Sherif, and of the present study is the issue-involvement. When Hovland, Janis & Kelley's explanation of acceptance of communication by the captive audience, presented above, is taken into consideration, Zimbardo's differentiation becomes ambiguous, since in both cases the subjects change their opinion in order to get reinforcement, such as getting approval, avoiding punishment, etc. The concept of the established attitude again seems to be a pertinent one for the explanation of the difference in the above studies. That is, in Zimbardo's subjects the communicator was highly credible (close friend), but potentially little established attitude on the issue of juvenile delinquency which could be strong enough to offset the friendship.

Hovland, Harvery & Sherif went a step further from the above explanation and predicted that under conditions of high involvement, increasing discrepancy would lead to decreasing attitude change. When the effects of high- and low- importance are examined separately for large- and small- discrepancy groups in the present study, there was found to be no interaction. In other words, both low-importance groups within the two different discrepancy groups consistently changed more toward the communication than did the high-importance groups.

No immediate explanation of this difference is possible. The degree of importance or of involvement, in the above study and the present study might be different, and might be responsible for the different result. Without making independent and comparable measures of establishment of attitude, importance, discrepancy, etc., no final explanations of the different results are possible.

Appendices

Appendix A

Table 11

Table 12

Table 13

Table 14

Table 11

Means of Experimental and Control
Groups for Six Respects Measured

	Mean		SD	
	Exp.	Cont.	Exp.	Cont.
Initial Position of the Ss.	7.13	7.04	2.58	2.60
Importance of the Topic	6.25	6.43	3.11	3.16
Judgment of the Communi- cator's Position	3.24	3.27	2.10	1.96
Trustworthiness of the Communicator	6.58	6.13	2.76	2.65
Fairness of the Communi- cation	5.58	5.81	3.22	2.76
Recall Score or Learning	3.48	3.49	0.85	0.80

Experimental Group N=149
Control Group N=67

Table 12

Net Proportion of Change for Each Experimental Sub-Group and the Control Group

	Control Group	High-Credibility		Low-Credibility	
		Large-Discrep.	Small-Discrep.	Large-Discrep.	Small-Discrep.
N	67	38	40	42	29
Positive Change	0.40	0.60	0.58	0.55	0.48
No Change	0.24	0.37	0.27	0.24	0.28
Negative Change	0.36	0.03	0.15	0.21	0.24
Net Proportion of Change	0.04	0.57**	0.43*	0.34**	0.24
Diff.		0.14		0.10	

Each experimental sub-group net proportion of change is compared with the net proportion of change of the control group.

* Significant at .05 level.

** Significant at .01 level.

All p values are tested by GRs, and are one-tailed unless otherwise specified.

Table 13

Mean Opinion Change for Each Experimental
Sub-Group and the Control Group

Discrepancy measured by difference be-
tween S's initial opinion position and
S's judgment of communicator's position

	Control Group	High-Credibility		Low-Credibility	
		Large- Discrep.	Small- Discrep.	Large- Discrep.	Small- Discrep.
N	67	40	38	38	35
Mean	0.28	2.50**	0.71	1.94**	-0.17
SD	2.73	1.10	1.10	2.93	2.24
Diff.		1.79**		2.11**	

** Significant at .01 level.

Table 14

Analysis of Variance of Change Scores for
Experimental Groups with Credibility
and Discrepancy as the Variables

Discrepancy measured by difference between S's initial opinion position and S's judgment of communicator's position

Source	s.s.	df	m.s.	F	p
Credibility (C)	19.63	1	19.63	3.58	-
Discrepancy (D)	141.46	1	141.46	25.77	<.01
Interaction: C x D	0.33	1	0.33	-	-
Within	796.74	145	5.49		
Total	958.16	148			

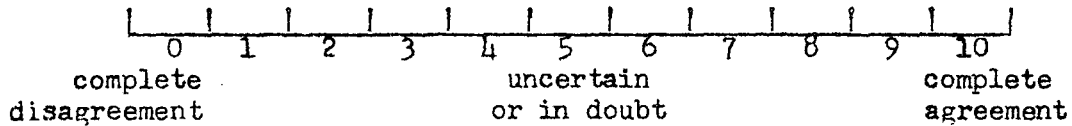
Appendix B
Before Questionnaire

This is an opinion survey on current social issues sponsored by the Human Relations Center of Boston University.

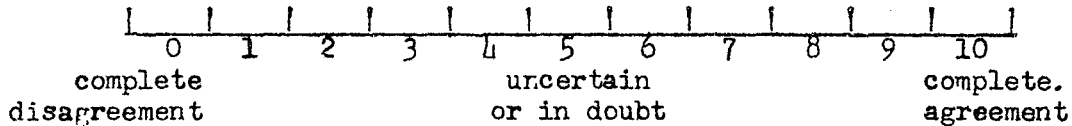
1. The following statements of opinion concern various social issues. Each statement expresses a point of view which may or may not coincide with your own views.

Please indicate your agreement or disagreement with each statement by marking a cross in that scale category which most closely corresponds to your own feelings on the matter. The scale ranges in equal steps from 0 (complete disagreement) through 5 (uncertain or in doubt) to 10 (complete agreement). For example: if you agree completely with a statement, place a cross in scale category 10; if you disagree completely, mark scale value 0; the other scale categories are to be used for lesser degrees of agreement or disagreement.

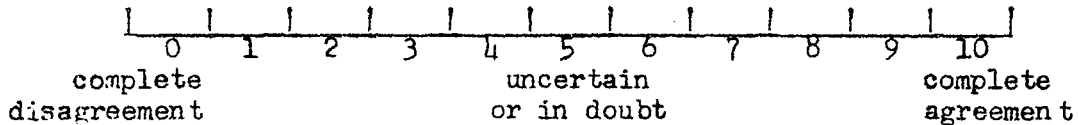
1. The fear of capital punishment prevents many people from committing murders.



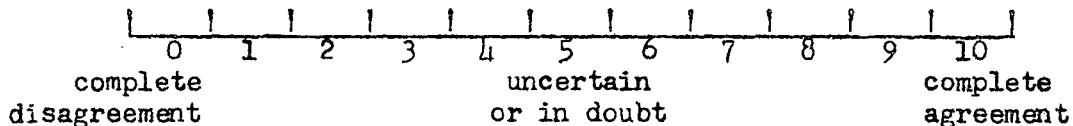
2. Communism is a more advanced economic system than capitalism just as capitalism was an advancement beyond feudalism.



3. People who smoke cigarettes are more likely to have lung cancer later in life than are people who do not smoke.

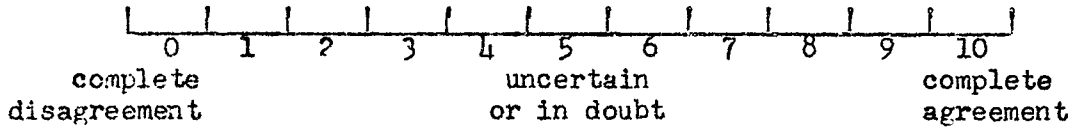


4. The danger of radioactivity fallout from the testing of nuclear weapons is greater than the threat of the increasing nuclear power of Russia.

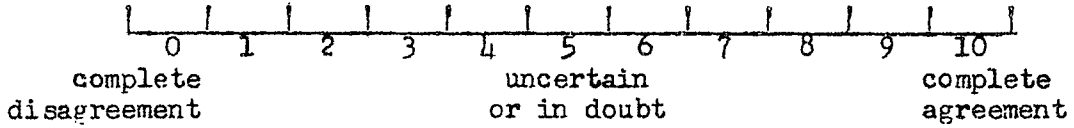


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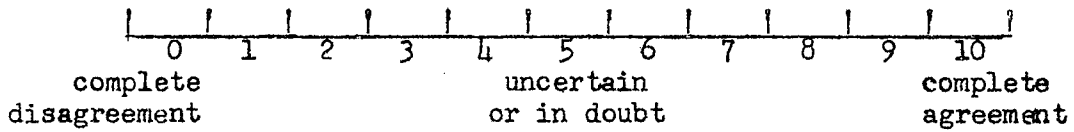
5. Within 30 years, Red China will be a greater threat than Russia to the people of free world.



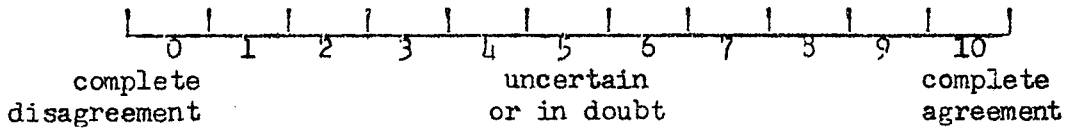
6. The testing of nuclear weapons should be stopped because of the increasing amount of radioactivity fallout which threatens human welfare.



7. Cigarette smoking is one of the causes of lung cancer.

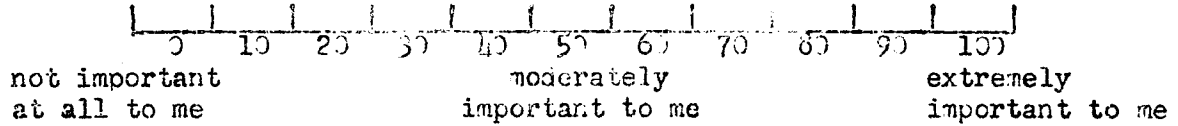


8. In dealing with juvenile delinquents, psychological counseling should be used instead of punishment.

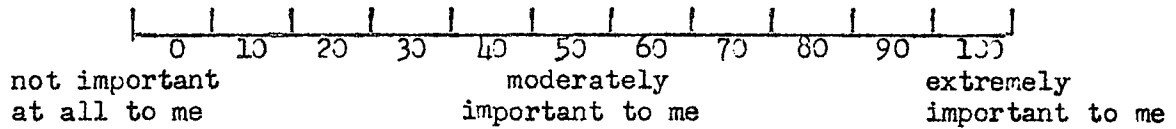


II. Now we would like you to indicate how important each of the following topics is to you. That is, how much are you concerned about or interested in each topic? Please rate each one by marking a cross in that scale category which most closely corresponds to your own feelings. The scale ranges from 0 (not important at all to me) to 100 (extremely important to me). The intervening numbers are to be used for degrees of importance greater than 0 but less than the maximum of 100.

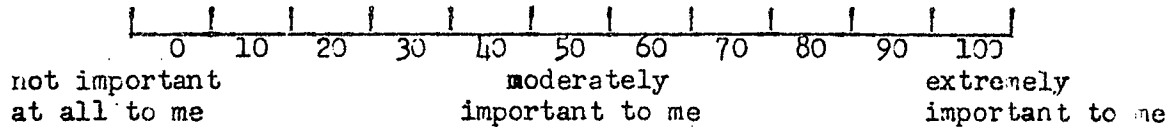
1. Capital punishment and prevention of murders.



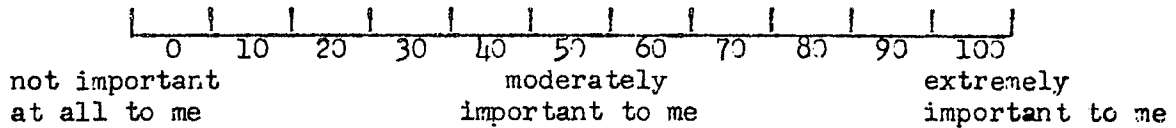
2. Communism vs. capitalism as an economic system.



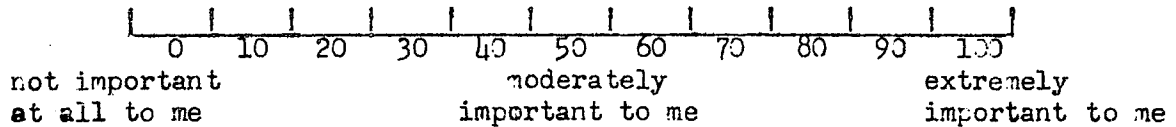
3. Testing of nuclear weapons and radioactivity fallout.



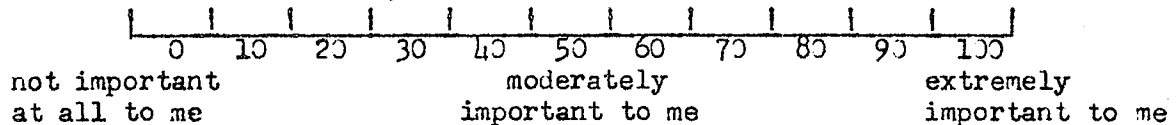
4. Cigarette smoking and lung cancer.



5. Threat of Red China.



6. Treatment of juvenile delinquents.



III. Now we would like you to rate each of the following persons or organizations in terms of their expertness and trustworthiness as a source of information on each of the following topics.

The "expertness" of a source refers to the amount of knowledge the source has on a particular topic. The "trustworthiness" of a source refers to his being a fair and unbiased communicator of the facts. For instance, you may believe that a certain source knows the available facts but, because of bias or special reasons, is not presenting the facts impartially or fairly. Or you may believe that a source has little knowledge of the facts, but that if he did know them he would present them fairly and impartially.

What you are asked to do, therefore, is to rate each of the following sources: first in terms of the amount of knowledge they are likely to have on a topic; then in terms of their trustworthiness or fairness and impartiality in presenting the facts.

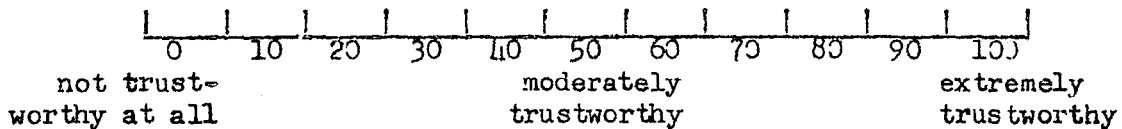
1. Communism vs. capitalism as an economic system.

a. Nikita Khrushchev.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

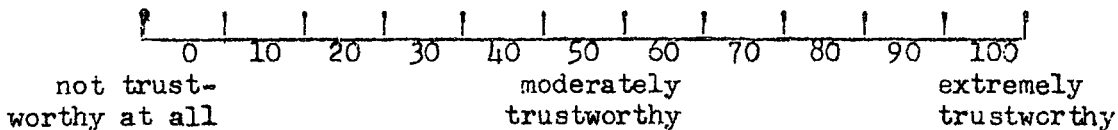


b. Arnold Petersen, National Secretary of Socialist Labor Party.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

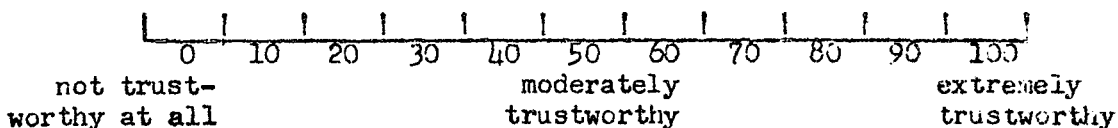


c. Dwight Eisenhower.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

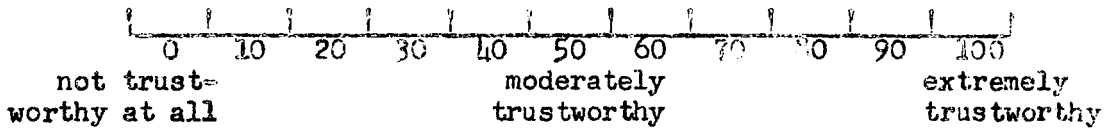


d. Jawaharlal Nehru, premier of India.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

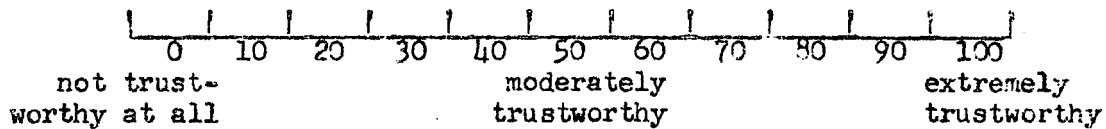


e. Mao Tse-Tung, Chairman of Communist China.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

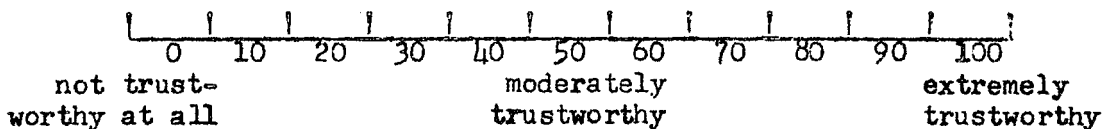


f. Fidel Castro, premier of Cuba.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,



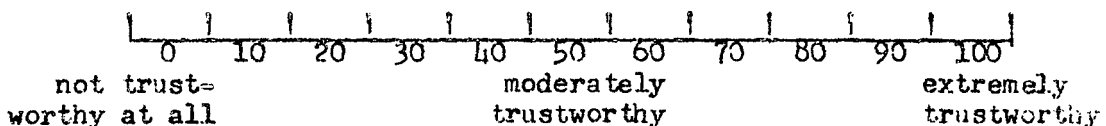
2. Cigarette smoking and lung cancer.

a. Your parent.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

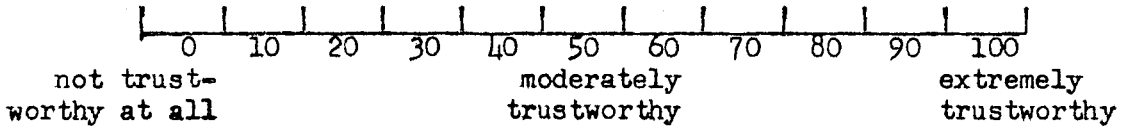


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b. American Tobacco Company.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

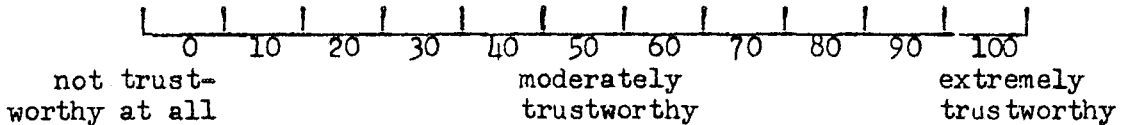
(2) On this topic,



c. Director of the Tobacco Industry Public Relations Committee.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

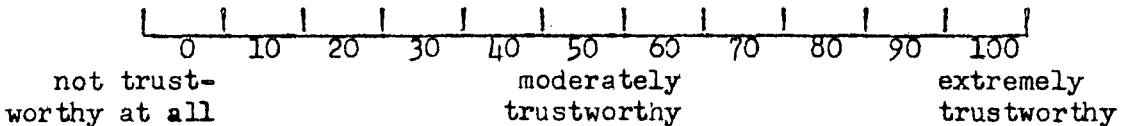
(2) On this topic,



d. Head of the National Cancer Institute.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

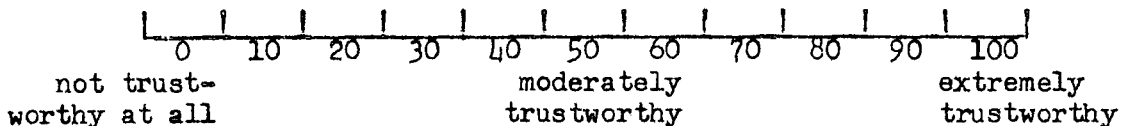
(2) On this topic,



e. Internal Revenue Service, U.S. Treasury Dept.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

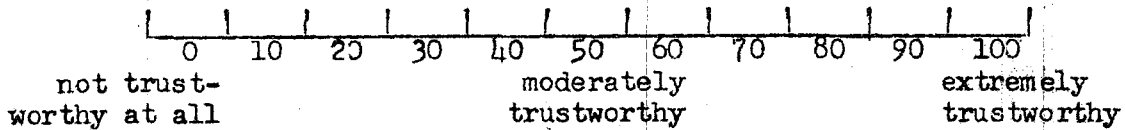


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f. Public Health Service.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,

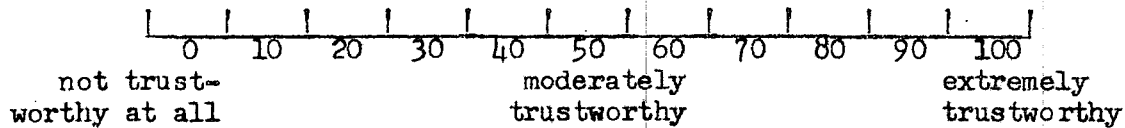


3. Testing of nuclear weapons and radioactivity fallout.

a. Neil McElroy, Secretary of Defense.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

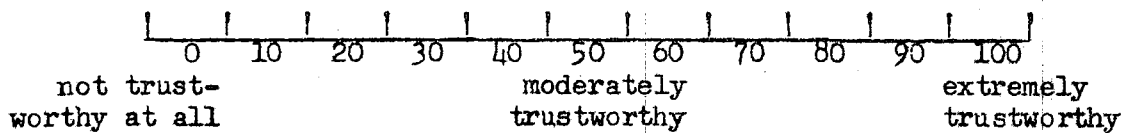
(2) On this topic,



b. Head of the National Cancer Institute.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

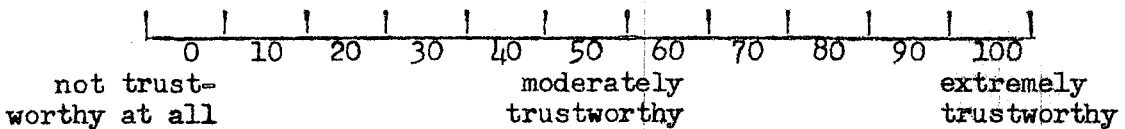
(2) On this topic,



c. Atomic Energy Commission.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the top

(2) On this topic,

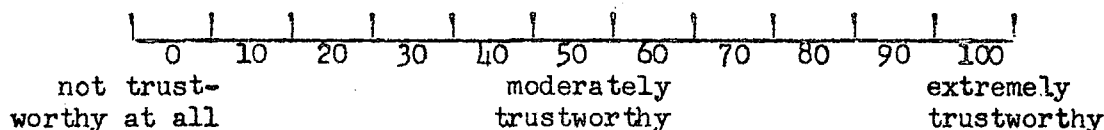


d. Albert Schweitzer, humanitarian.

(1) On this topic, likely to know:

all the facts ; most of the facts ; some of the facts ; only a few facts ; almost nothing about the topic

(2) On this topic,

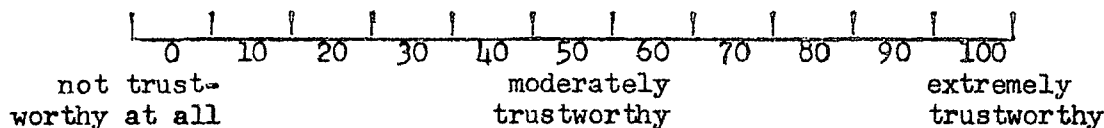


e. Robert Oppenheimer.

(1) On this topic, likely to know:

all the facts ; most of the facts ; some of the facts ; only a few facts ; almost nothing about the topic

(2) On this topic,

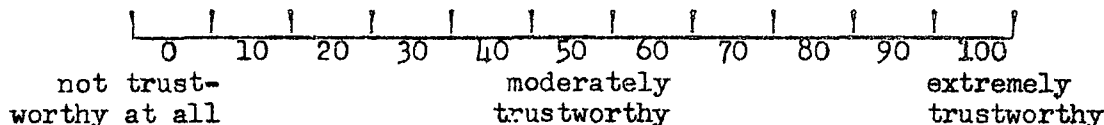


f. Nikita Khrushchev.

(1) On this topic, likely to know:

all the facts ; most of the facts ; some of the facts ; only a few facts ; almost nothing about the topic

(2) On this topic,



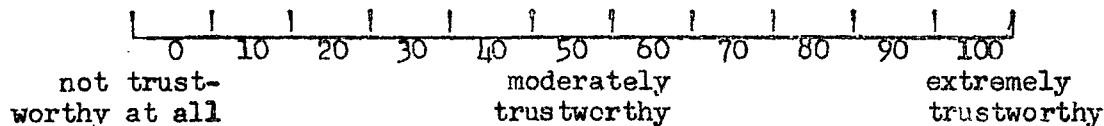
4. Treatment of juvenile delinquents.

a. Governor Rockefeller.

(1) On this topic, likely to know:

all the facts ; most of the facts ; some of the facts ; only a few facts ; almost nothing about the topic

(2) On this topic,

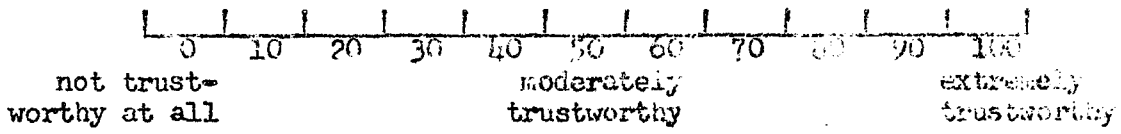


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b. Edward McCormack, Attorney General of Mass.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost entirely about the facts.

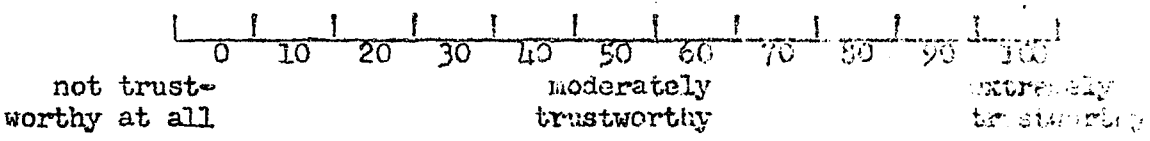
(2) On this topic,



c. a psychologist.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost entirely about the facts.

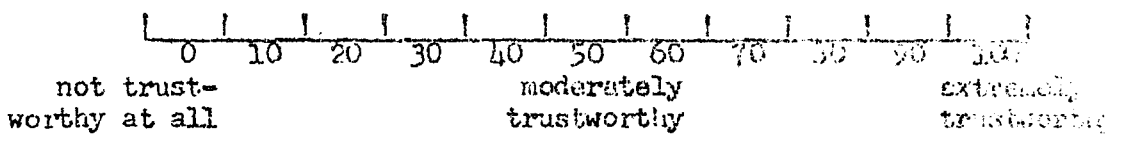
(2) On this topic,



d. a gang leader in New York City.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost entirely about the facts.

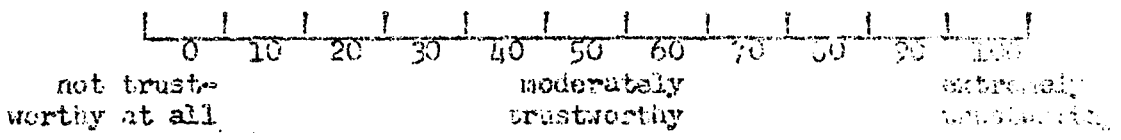
(2) On this topic,



e. U.S. Supreme Court.

(1) On this topic, likely to know:
all the facts ; most of the facts; some of the facts; only a few facts; almost entirely about the facts.

(2) On this topic,

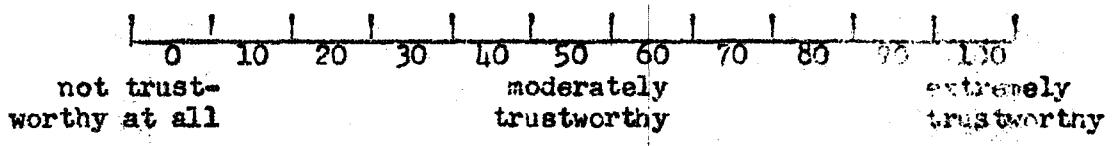


3. Institution for juvenile and youth offenders.

(1) On this topic, likely to know:

all the facts ; most of the facts; some of the facts; only a few facts; almost nothing about the topic

(2) On this topic,



(Continue to the next page)

Please provide the following information which is needed to carry out the analysis of the data. This portion of the questionnaire will be destroyed after coding. Your name will be replaced by a code number, and handled by the research team only.

Your Name: _____

Sex: F _____ M _____

Age: _____

Major: _____

Year: Fresh. _____; Sopho. _____; Junior _____; Senior _____; Grad. _____

Thank you for your cooperation.

Appendix C
After Questionnaire

Communication

High-Credible Communicator With Anchor Statement
High-Credible Communicator Without Anchor Statement

The following article was delivered as a speech by Dr. W. C. Hueper, head of the Environmental Cancer Section of the National Cancer Institute, Public Health Service.

A Factual Report on the Relationship
between Cigarette Smoking and Lung Cancer

Tonight I should like to present to you with an objective and impartial eye the facts, as we know them, on the currently controversial medical issue of cigarette smoking and lung cancer. Most discussions of this topic have generated more emotional heat than rational light. As a consequence, people vary widely in their opinions on this matter. Some hold the extreme belief that cigarette smoking is unquestionably a cause of lung cancer and that if you smoke cigarettes you will eventually have lung cancer. Others hold to the extreme opposite belief that cigarette smoking bears no relationship to whether or not a person will have lung cancer. What is a sound position? What belief is justified by the currently known facts? Well, let us look at the facts.

Serious challenges to the claim, based solely on statistical data, that there is a direct causal relationship between cigarette smoking and lung cancer are made by many research scientists and medical statisticians.

The assertion that there is a direct cause-and-effect relationship between cigarette smoking and the great increase in recent years in the incidence of lung cancer is based on a massive statistical study carried out on the smoking habits of 188,000 men 50 to 70 years old. About 60 per cent were regular smokers, the others had not smoked. According to their statistics men who smoke cigarettes are 10 times more likely to die of lung cancer than non-smokers. The statistical study concluded that the lung cancer death rate is 1,000 per cent higher in smokers than among non-smokers. In other words, the study claimed that there is a spectacular relationship between smoking habit and lung cancer.

High Credibility Without Anchor Statement.

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Delivered by Dr. W. C. Hueper, head of the Environmental Cancer
Section of the National Cancer Institute, Public
Health Service.

To be scientifically acceptable, any theory on the cause of lung cancer must reflect a critical, balanced, and competent analysis of all the available medical, and experimental evidence. We must know not merely the percentage of cigarette smokers with lung cancer, but concerning the types and environmental distributions of and contacts with all known or suspected exogenous agents. It is only through such scrutiny that significant and worthwhile information may be obtained as to the relative role which cigarette smoking has played and is playing in the production of lung cancer. The following facts, observations, and experiments form an important and integral part of such an assessment.

First of all, the evidence challenges the conclusion that there is a direct causal relationship between smoking and the increase in the incidence of lung cancer. Statistical or correlational association is not causation. For example, it turned out that there is more incidence of juvenile delinquency among poor families than rich families. That is, increase of juvenile delinquency is positively correlated or has statistical association with poverty. On the other hand, there is more incidence of juvenile delinquency in urban areas where people earn much more money than rural areas. This paradoxical evidence suggests that neither poverty nor urbanization alone can be a cause of juvenile delinquency. It is obvious that there must be many other factors responsible for juvenile delinquency other than poverty or urbanization. There may be a more basic factor such as lack of affection or guidance on the part of parent which can come from both poverty and urbanization. Poor families neglect their children because they are busy in earning their livings, while in the more industrialized city areas both parents are employed, which results in deprivation of affection or guidance from their children. Thus, poverty may

Delivered by Dr. W. C. Hueper, head of the Environmental Cancer Section of the National Cancer Institute, Public Health Service.

be an important factor of juvenile delinquency, and urbanization may be another important factor of juvenile delinquency, but there still may be "deprivation of affection or guidance" which is an important factor of both, and without which neither poverty nor urbanization would operate to produce juvenile delinquency.

Likewise there are numerous contradicting evidences against the notion that there is a link between cigarette smoking and lung cancer. For instance, it is surprising to note the absence of positive statistical associations between lung cancer and cigarette cough, although this later symptom is clinically characteristic of chronic chain smokers. Despite the fact that the lips and mouth are constantly bathed in the tarry liquor oozing from the tip of the cigarettes, and despite the contact of these parts with the smoke coming from the cigarettes, there is no consistent statistical association with cancer of these parts. The assertion that no tarry material exudes from the cigarette tip is contradicted by the evident fact that chronic cigarette smokers are observed to have brown-stained fingers. But no single record is available of cancer of the fingers attributable to cigarette tar. Such cancers of the fingers would be equivalent to the numerous cases of coal tar cancers of the hands for which records are available.

Other studies turned up the apparent paradoxical fact that inhaling was less common among cancer patients than among non-cancer patients. Among 105 lung cancer patients only 2 persons (less than 2 per cent) were reported to inhale while about 30 per cent of the smokers who did not develop lung cancer were reported to have inhaling habits.

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Section of the National Cancer Institute, Public
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Without going further to numerate such statistical findings, it is apparent that cigarette smoking alone cannot be the cause of lung cancer. There must be many other factors other than cigarette smoking working on in producing lung cancer. To name some, increased volumes of automobile exhaust fumes and industrial vapors polluting the air are to a great part responsible for the causation of lung cancer.

To prove or disprove that there is a causal relationship between cigarette smoking and lung cancer, one must have more reliable evidence from the controlled experiments. Although the evidence linking cigarette smoking with lung cancer is inconclusive, as it is apparently impossible to carry out properly controlled experiments with human beings, the following experiments offer enough confidence to reject the unwarranted assertion that there is a direct causal association between cigarette smoking and lung cancer.

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In other words, all experiments with animal have failed to provide any clear-cut result that cigarette smoking is a cause of lung cancer at least in animal levels. From the past experience in medical research it has been proven that there is biological equivalence between human and sub-human mammals, which includes rabbits and mice among others. Most of the medical experiments are done on the laboratory animals from the apparent impossibility of using human being as the subject. From these results on animal experiments, medical scientists extend their generalization to human being, and this has proven to be valid and reliable for most of the incidence.

If the premise that the experimental results on laboratory animals can be generalized to human being was true; and there is not a single evidence that can prove cigarette smoking is a cause of lung cancer on these animals; then the conclusion that there is no evidence to prove cigarette smoking is a cause of lung cancer on human being would follow. The above reasoning is based on the logical syllogism in that if the premise is true, then the conclusion necessarily follows from the premise.

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From these considerations, it is apparent that any final decision concerning the role of cigarette smoking in the causation of the human lung cancer should be kept in abeyance until a great deal of additional and valid, and especially experimentally conclusive evidence becomes available. The data on hand make it unlikely that cigarette smoking represents a major cause in the production of lung cancer and in its recent increase.

It is not conclusive to say that the cigarette smoking is not a cause of lung cancer, simply because there are no experimental results available on human being. It is, however, much more injudicious to establish a causal relationship between cigarette smoking and lung cancer based on these ambiguous statistical evidence. Today, more than ever before, scientific evidence is accumulating that conflicts with or fails to support the tobacco smoking theories of lung cancer. Sheer comparison of the evidences from both sides indicates that there are significantly more sound experimental results that can reject the notion that the cigarette smoking is a cause of lung cancer than accepting it.

Communication

Low-Credible Communicator With Anchor Statement
Low-Credible Communicator Without Anchor Statement

Low Credibility With Anchor Statement.

The following article was delivered as a speech by Mr. J. P. Richards, director of the Tobacco Industry Public Relations Committee which includes American Tobacco Company, R. J. Reynolds, Liggett & Meyers, Brown Williamson.

A Factual Report on the Relationship
between Cigarette Smoking and Lung Cancer

Tonight I should like to present to you with an objective and impartial eye the facts, as we know them, on the currently controversial medical issue of cigarette smoking and lung cancer. Most discussions of this topic have generated more emotional heat than rational light. As a consequence, people vary widely in their opinions on this matter. Some hold the extreme belief that cigarette smoking is unquestionably a cause of lung cancer and that if you smoke cigarettes you will eventually have lung cancer. Others hold to the extreme opposite belief that cigarette smoking bears no relationship to whether or not a person will have lung cancer. What is a sound position? What belief is justified by the currently known facts? Well, let us look at the facts.

Serious challenges to the claim, based solely on statistical data, that there is a direct causal relationship between cigarette smoking and lung cancer are made by many research scientists and medical statisticians.

The assertion that there is a direct cause-and-effect relationship between cigarette smoking and the great increase in recent years in the incidence of lung cancer is based on a massive statistical study carried out on the smoking habits of 188,000 men 50 to 70 years old. About 60 per cent were regular smokers, the others had not smoked. According to their statistics men who smoke cigarettes are 10 times more likely to die of lung cancer than non-smokers. The statistical study concluded that the lung cancer death rate is 1,000 per cent higher in smokers than among non-smokers. In other words, the study claimed that there is a spectacular relationship between smoking habit and lung cancer.

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To be scientifically acceptable, any theory on the cause of lung cancer must reflect a critical, balanced, and competent analysis of all the available medical, and experimental evidence. We must know not merely the percentage of cigarette smokers with lung cancer, but concerning the types and environmental distributions of and contacts with all known or suspected exogenous agents. It is only through such scrutiny that significant and worthwhile information may be obtained as to the relative role which cigarette smoking has played and is playing in the production of lung cancer. The following facts, observations, and experiments form an important and integral part of such an assessment.

First of all, the evidence challenges the conclusion that there is a direct causal relationship between smoking and the increase in the incidence of lung cancer. Statistical or correlational association is not causation. For example, it turned out that there is more incidence of juvenile delinquency among poor families than rich families. That is, increase of juvenile delinquency is positively correlated or has statistical association with poverty. On the other hand, there is more incidence of juvenile delinquency in urban areas where people earn much more money than rural areas. This paradoxical evidence suggests that neither poverty nor urbanization alone can be a cause of juvenile delinquency. It is obvious that there must be many other factors responsible for juvenile delinquency other than poverty or urbanization. There may be a more basic factor such as lack of affection or guidance on the part of parent which can come from both poverty and urbanization. Poor families neglect their children because they are busy in earning their livings, while in the more industrialized city areas both parents are employed, which results in deprivation of affection or guidance from their children. Thus, poverty may

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If the premise that the experimental results on laboratory animals can be generalized to human being was true; and there is not a single evidence that can prove cigarette smoking is a cause of lung cancer on ~~these animals~~; then the conclusion that there is no evidence to prove cigarette smoking is a cause of lung cancer on human being would follow. The above reasoning is based on the logical syllogism in that if the premise is true, then the

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After-Measures

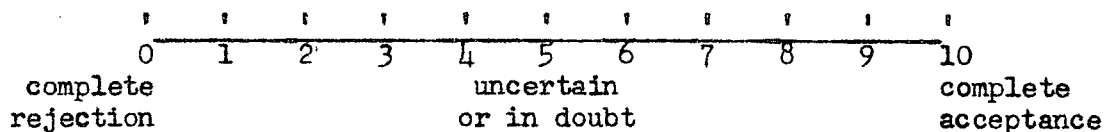
I. Now, we would like to obtain your evaluation of the article and of the communicator.

1. First, estimate the position of the author of the article you have just read on the scales below.

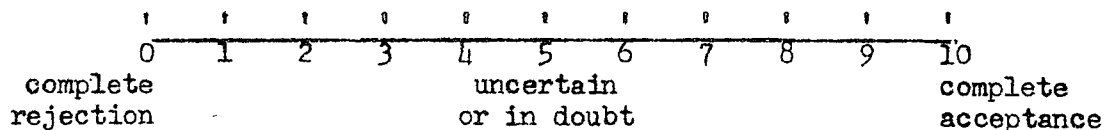
Scale ranges in equal steps from 0 through 5 to 10. 0 represents the complete rejection of the statement; 5 represents uncertain or in doubt; and 10 represents the complete acceptance of the statement.

You will indicate the position of the author of the above article by circling the number which you think best represents his position. For example, if you think the author of the article rejects the statement completely, circle 0; and if you think he accepts it completely circle 10. You may circle any number along the scale from 0 to 10.

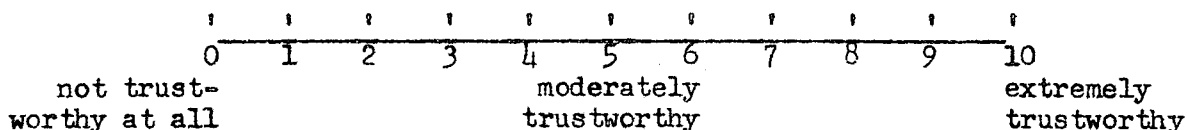
a. Cigarette smoking is one of the causes of lung cancer.



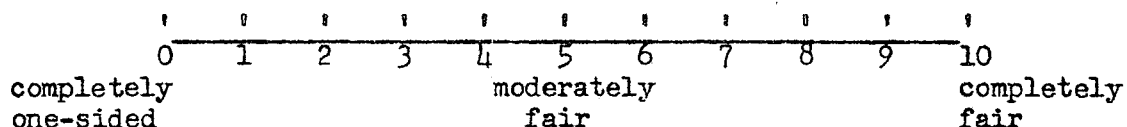
b. Cigarette smoking is statistically associated with occurrence of lung cancer.



2. How do you rate the author of the article in terms of his trustworthiness? Please indicate the degree of trustworthiness of the author by circling the number along the scale below.



3. Do you think the article is fair or one-sided? Please indicate the degree of fairness by circling the number along the scale below.



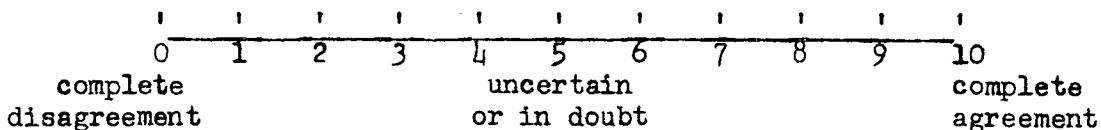
(This page comes before the communication for the control groups)

II. Now, we would like to obtain some information concerning your own beliefs about cigarette smoking and lung cancer.

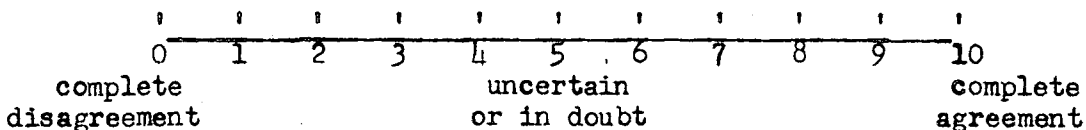
1. Please indicate your agreement or disagreement with the following statements by circling the number which best represents your own feelings along the scale below.

Scale ranges in equal steps from 0 (complete disagreement) through 5 (uncertain or in doubt) to 10 (complete agreement) with the statement. For example, if you disagree with the statement completely circle 0, and if you agree with it completely circle 10. You may circle any number along scale from 0 to 10.

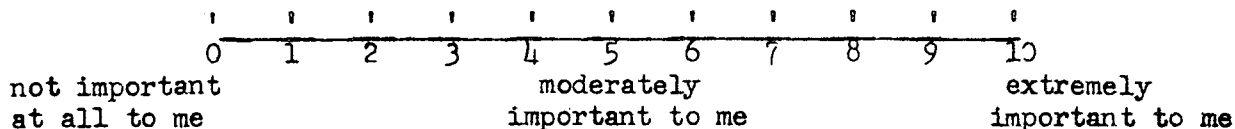
a. Cigarette smoking is one of the causes of lung cancer.



b. People who smoke cigarettes are more likely to have lung cancer later in life than are people who do not smoke.



2. Please indicate how important is this topic of cigarette smoking and lung cancer to you along the scale below.



III. Now we would like to determine how well you recall some of the points made in the article. Following items are the multiple choice questions about the article you have read. Please select one alternative among four alternatives which you think is correct or the best.

Please do not return to the article even you do not recall some of the facts. We are interested in getting your first response without going back to the article.

1. Statistical association between cigarette smoking and lung cancer indicates one of the following:

- 1. one-to-one relationship.
- 2. causal relationship.
- 3. no causal relationship.
- 4. no relationship at all

2. The assertion that there is cigarette-cancer link is conclusive only when:

- 1. there is enough statistical evidence.
- 2. there is enough experimental results on laboratory animals.
- 3. combination of 1 and 2.
- 4. there is enough experimental evidence on human beings.

3. The inhaling habit was more common among:

- 1. non-cancer patients.
- 2. cancer patients.
- 3. constant smokers.
- 4. chain smokers.

4. Laboratory rabbits who are exposed to inhalation of cigarette smoke:

- 1. all of them developed lung cancer.
- 2. about 10% of them developed lung cancer.
- 3. less than 2% of them developed lung cancer.
- 4. none of them developed lung cancer.

5. Generalization on human being from the animal experiments:

- 1. is false.
- 2. is logically false.
- 3. is valid when the premise is true.
- 4. is valid when the premise is false.

IV. We would like to have some information concerning your smoking habit.

1. Do you smoke?

YES _____ ; Smoked before but stopped _____ ; NO _____ .

What do you smoke?

cigarette _____ ;
 pipe _____ ;
 cigar _____ .

What did you smoke?

cigarettes _____ ;
 pipe _____ ;
 cigar _____ .

How many cigarettes (or
 packs) do you smoke
 a day?

_____ less than 5 cigarettes
 _____ 6 to 10 "
 _____ 11 to 15 "
 _____ 16 to 20 "
 _____ 21 to 30 "
 _____ 31 to 40 "
 _____ more than 2 packs

How many cigarettes (or
 packs) did you smoke
 a day?

_____ less than 5 cigarettes
 _____ 6 to 10 "
 _____ 11 to 15 "
 _____ 16 to 20 "
 _____ 21 to 30 "
 _____ 31 to 40 "
 _____ more than 2 packs

It would be appreciated if you could provide the following information.

Your Name : _____

Major : _____

Year: _____

Are you interested in getting the results of the study later?

Yes: _____ No: _____

Comment if any:

Note: This page will be destroyed after your name is replaced by a code No.

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Abstract

Although previous researches have directed considerable attention toward the effect on opinion change of isolated variables such as communicator-credibility and communication-discrepancy, among others, little attempt has been made to incorporate these variables into a single experimental design in order to assess their separate as well as combined effects. The purpose of the present study is to vary experimentally the degree of communicator-credibility and communication-discrepancy, thereby investigating the main and interaction effects of these two variables on opinion change.

Reviewing the existing research evidences leads to the following hypotheses:

Greater extent of opinion change toward the communication is expected when: communicator is high-credible than low-credible; and communication-discrepancy is large than small. When the communicator is high-credible, greater extent of opinion change is expected for large-discrepancy than small-discrepancy group. No hypothesis is advanced on the effect of communication when the communicator-credibility is low.

In order to test the above hypotheses, a before-after design was used. Among 216 college students, 149 subjects, who served as the experimental group, were exposed to the communication which advocated the idea that there is no causal relationship between cigarette smoking and lung cancer. One half of the experimental subjects read the communication in which the source is

attributed to a high-credible communicator and the other half read it from a low-credible communicator. Also, for one half of each group, a few additional anchor statements, that some people hold to the opinion-extremes on the issue, were inserted at the beginning of the communication in the expectation that these anchor statements would affect the subjects to judge the communication as less extreme than they would without these statements. The other half read the communication without these anchor statements. The former is, therefore, called the small-discrepancy, and the latter the large-discrepancy groups.

Opinion positions on the issue discussed in the communication were measured before and after the communication. In addition to these, a series of judgmental items was included in order to obtain measures on the experimental variables, and other relevant information.

The control group (N=67) gave their opinions before reading the communication, and then made the same judgments of the communication as did the experimental subjects.

The checks on the experimental manipulations of the above two variables indicate that only the high vs. low communicator-credibility was successfully differentiated. Due to the failure of the manipulation of the discrepancy variable by anchor statements, the communication-discrepancy of the present study was derived from the subject's judgments on the communicator's position.

The subjects were divided into two groups using the median of the communicator's position judged by the subjects as the

cutting point. The above-median group is called the small-discrepancy group, and the below-median the large-discrepancy group, since the below-median group as a whole is more discrepant than the above-median group with reference to their overall initial opinion position. The control subjects were also separated on this communication-discrepancy.

The opinion change is assessed by the change score from before to after communication. The experimental group showed significantly greater extent of opinion change toward the communication than the control group showed. The results also confirmed the hypotheses advanced. Thus:

(1) The group who received the communication which was attributed to the high-credible source significantly changed more toward the communication than did the group which read the communication from the low-credible source.

(2) The subjects who judged the communicator's position as more discrepant from their own stand changed significantly more toward the communication than did those who judged it less discrepant.

(3) The interaction effect between these two main variables, communicator-credibility and communication-discrepancy, was not significant. That is, within high- and low-credible groups, both large-discrepancy groups changed more toward the communication than did the small-discrepancy groups.

The effects on opinion change of other related variables—such as the importance of the topic, smoking habits, fairness of the article, and learning—were examined.

Brief Autobiography

Date of birth: April 9, 1929.

Place of birth: Seoul, Korea.

Parents: Yo-Han Choo and Sun-Pok Choi Choo.

Education:

B.A., Ewha Womans University, 1950 (English Literature).

M.A., Ewha Womans University, 1954 (Psychology).

Educational Positions:

1951-1954; Teaching and research assistant, Dept. of Psychology, Ewha Womans University.

1958-1960; Research assistant, Human Relations Center, Boston University.

