The Relative Efficacy of High and Low Credible Sources in Immunizing Refutational-Same and Supportive Defenses Against Belief-Reducing Counterarguments

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THE RELATIVE EFFICACY OF HIGH AND LOW CREDIBLE SOURCES IN IMMUNIZING REFUTATIONAL-SAME AND SUPPORTIVE DEFENSES AGAINST BELIEF-REDUCING COUNTERARGUMENTS

BY

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THESIS
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1974
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And to Gwenyth, who contributed at least as much as I to the finished manuscript through her patience, faith, love, and good common sense.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>viii</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIST OF FIGURES</th>
<th>ix</th>
</tr>
</thead>
</table>

## INTRODUCTION

Motivation and Practice: Basic Assumptions .................................................. 4
Manipulation of Defensive Variables ............................................................ 5
Basic Procedures ................................................................................................. 8

## RESEARCH

Refutational-different Defenses ........................................................................ 12
Attack-Forwarning Manipulation ........................................................................ 14
Prior Reassurance Manipulation ........................................................................ 15
Persistence of the Resistance ............................................................................. 17
Congruity Principle Strategies ........................................................................... 19

## SOURCE CREDIBILITY: AN ELUSIVE VARIABLE

Fixed Ethos Models ............................................................................................. 29
Relevant and Irrelevant Characteristics ............................................................ 30
Learning and Attitude Change ........................................................................... 32
Similarity and Attitude Change ......................................................................... 35
Message Credibility ............................................................................................ 36
Source Introductions ......................................................................................... 38
Factor Analytic Studies ....................................................................................... 42
High and Low Source Manipulations ................................................................. 51
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Credibility Summary</td>
<td>61</td>
</tr>
<tr>
<td>STATEMENT OF HYPOTHESES</td>
<td>63</td>
</tr>
<tr>
<td>METHOD AND GENERAL PROCEDURE.</td>
<td>74</td>
</tr>
<tr>
<td>SUBJECTS.</td>
<td>76</td>
</tr>
<tr>
<td>EXPERIMENTAL DESIGN</td>
<td>76</td>
</tr>
<tr>
<td>MATERIALS AND TREATMENTS.</td>
<td>80</td>
</tr>
<tr>
<td>Opinion Measures</td>
<td>82</td>
</tr>
<tr>
<td>Source Measures</td>
<td>83</td>
</tr>
<tr>
<td>Source Messages</td>
<td>84</td>
</tr>
<tr>
<td>Defensive Messages</td>
<td>86</td>
</tr>
<tr>
<td>Counterattacking Messages</td>
<td>87</td>
</tr>
<tr>
<td>INDEPENDENT VARIABLES</td>
<td>88</td>
</tr>
<tr>
<td>Sources.</td>
<td>88</td>
</tr>
<tr>
<td>Defensive Pretreatments.</td>
<td>89</td>
</tr>
<tr>
<td>DEPENDENT VARIABLES</td>
<td>89</td>
</tr>
<tr>
<td>Sources.</td>
<td>89</td>
</tr>
<tr>
<td>Resistance to Persuasion</td>
<td>90</td>
</tr>
<tr>
<td>RESULTS</td>
<td>90</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>90</td>
</tr>
<tr>
<td>Adequacy of Experimental Conditions.</td>
<td>90</td>
</tr>
<tr>
<td>Measurement of Opinion Items</td>
<td>91</td>
</tr>
<tr>
<td>Adequacy of Source Manipulations</td>
<td>94</td>
</tr>
<tr>
<td>Effectiveness of Source Manipulations</td>
<td>98</td>
</tr>
<tr>
<td>on Belief Level.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX I: SUPPORTIVE AND REFUTATIONAL-SAME COUNTERARGUMENTS. 193
APPENDIX J: FILLER ESSAYS. 202
REFERENCES. 205
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Semantic Differential Scales</td>
<td>47</td>
</tr>
<tr>
<td>2. Design for Data Analysis</td>
<td>79</td>
</tr>
<tr>
<td>3. Mean Belief Levels Produced by Source Manipulations</td>
<td>92</td>
</tr>
<tr>
<td>4. Mean Belief Levels Produced by All Source-Message Combinations</td>
<td>93</td>
</tr>
<tr>
<td>5. Source Credibility Means for Source Treatment and Source Control Groups</td>
<td>97</td>
</tr>
<tr>
<td>7. Analysis of Variance of Authoritativeness and Character Dimensions of Source Credibility in Counterargument Message Strategies</td>
<td>100</td>
</tr>
<tr>
<td>8. Analysis of Variance for Experimental Groups</td>
<td>121</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1.</td>
<td>Experimental Design</td>
</tr>
<tr>
<td>2.</td>
<td>Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations: Low Defense versus Low Attack</td>
</tr>
<tr>
<td>3.</td>
<td>Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations: Low Defense versus High Attack</td>
</tr>
<tr>
<td>4.</td>
<td>Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations: High Defense versus Low Attack</td>
</tr>
<tr>
<td>5.</td>
<td>Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations: High Defense versus High Attack</td>
</tr>
<tr>
<td>6.</td>
<td>Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations: High Defense versus Low Defense and High Attack versus Low Attack</td>
</tr>
<tr>
<td>7.</td>
<td>Comparison of Mean Belief Levels for Supportive Source-Message Combinations: Low Defense versus Low Attack</td>
</tr>
<tr>
<td>8.</td>
<td>Comparison of Mean Belief Levels for Supportive Source-Message Combinations: Low Defense versus High Attack</td>
</tr>
<tr>
<td>9.</td>
<td>Comparison of Mean Belief Levels for Supportive Source-Message Combinations: High Defense versus Low Attack</td>
</tr>
<tr>
<td>10.</td>
<td>Comparison of Mean Belief Levels for Supportive Source-Message Combinations: High Defense versus High Attack</td>
</tr>
<tr>
<td>11.</td>
<td>Comparison of Mean Belief Levels for Supportive Source-Message Combinations: High Defense versus Low Defense and High Attack versus Low Attack</td>
</tr>
</tbody>
</table>
Figure 12. Mean Comparisons for Refutational Pre-Message and Post-Message Authoritativeness Levels . . . . . . . . . . 117

Figure 13. Mean Comparisons for Supportive Pre-Message and Post-Message Authoritativeness Levels . . . . . . . . . 118
In 1961, William J. McGuire and Demetrios Papageorgis collaborated on a study designed to investigate, among other things, how to develop in people resistance to attacks against their belief. The completed study, appearing in the *Journal of Abnormal and Social Psychology*, was the first in a series of experiments on inducing resistance to persuasion approached from a biological analogy, inoculation theory.

Noting that "people characteristically defend their convictions by avoiding exposure to counterarguments [McGuire 1961a, p. 327], "observed that such a mechanism is likely to be highly effective for maintaining one's belief so long as the person can adequately regulate his exposure to arguments. The disadvantage, however, as postulated by McGuire, is that it leaves the individual unprepared to resist counterarguments under conditions of involuntary exposure, thus leaving the person's belief in a state analogous to the health of a person brought up in a germ-free environment. McGuire (1961a) continued the analogy accordingly:

> Just as a person brought up in an aseptic environment has failed to develop resistance to infection and, hence, although appearing in very good health, proves quite vulnerable when suddenly exposed to a massive dose of an infectious virus [p. 327].
McGuire's research, based on the one-sided versus two-sided experiment of Lumsdaine and Janis (1953), suggested that the disease resistance of such a person might be raised by two procedures: he might be given "supportive therapy" (rest, exercise, vitamins, good diet) designed to better his physical condition, with the hopes of making him more resistant to subsequent viral attacks, or he might be given an "inoculation" of the infectious virus itself in a weakened form such as would stimulate the body's chemistry without overwhelming the organism. Noting that the inoculation procedure is generally more effective in developing immunity to specific diseases, McGuire posited that, similarly, we should be able to develop resistance to persuasion of a person raised in an ideologically aseptic environment by pre-exposing him to weakened forms of the counterarguments, or other belief motivating material. A mild dose should stimulate the individual's defenses so that he will be better able to overcome any subsequent massive viral attack, but the dosage is not so strong that it will itself cause the disease. Theoretically, such a procedure should serve to inoculate the individual's belief system. Alternatively, the inoculation procedure or biological resistance can be increased by supportive therapy such as adequate rest, vitamins, exercise, and good diet. However, inoculation is likely to be far superior to the supportive therapy to the extent that the
person has been raised in a germ-free environment. Consequently, just as biological supportive therapy would tend to make the person raised in a germ-free environment vigorously healthy, but highly vulnerable to viral attacks, similarly "supportive defenses" would only serve to reinforce positive reason for belief maintenance, providing no immunity to unexpected attacks.

To ensure that the beliefs represented in the experiment met the criteria for the inoculation theory proposed, McGuire used "cultural truisms" as the belief to be made resistant to attack. Operationally, cultural truisms are those beliefs that reflect a 75 percent total acceptance rate on a 15-point scale. Cultural truisms as later defined by Rosnow & Robinson (1967) are "beliefs that are so widely held within the person's social milieu that he would not have heard them attacked, and would doubt that an attack were even possible [p. 201]." After much pretesting, the area of health beliefs was found to abound with unanimously accepted propositions. On the basis of earlier surveys of student opinions four issues from the area of health beliefs were isolated from a selected pool of 20, all of which dealt with related health topics. Nearly 75 percent of the student's surveyed checked "15" on a 15-point scale indicating complete agreement with beliefs such as "Everyone should get a chest X-ray each year in order to detect any possible tuberculosis symptoms
at an early state"; "The effects of penicillin have been, almost without exception, of great benefit to mankind"; "Most forms of mental illness are not contagious"; "Everyone should brush his teeth after every meal if at all possible." The subjects indicated their beliefs to the declarative statements by marking an "X" in the appropriate space on a 15-interval scale. The scale, graphically illustrated below, has been widely used in research pertaining to opinion change.

Motivation and Practice: Basic Assumptions

The basic assumption of the inoculation theory paradigm is that a belief existing in a nonthreatening environment should be highly vulnerable to counterattacking persuasive arguments. The vulnerability depends, however, on the existence of two major conditions: 1) lack of practice in defending the truism, and 2) lack of motivation to defend the truism. The subject is unpracticed because he has never been called upon to defend the truism, and is unmotivated because he regards the belief as unassailable, and can see no reason to belabor the obvious. It then follows that any type of pre-treatment designed specifically to improve the subject's defenses must motivate him to question the validity of his firmly held beliefs, while
requiring mental rehearsal of the arguments on both sides. Such rehearsal is required to bolster the individual's belief defense system against subsequent persuasive attacks.

Manipulation of Defensive Variables

McGuire has investigated the effects of three defensive variables, the amount of threat; the amount of active participation required; and the amount of time between the defense and the attack of the truism. In conducting the investigation pertaining to the amount of threat, two basic types of defenses were used which differed in the amount of threat: "supportive defenses" and "refutational-same defenses." The supportive defense was considered to be non-threatening since it served only to augment the believer's support of the belief. The refutational defense, however, was threatening in that it mentioned several arguments attacking the belief, and then refuted the arguments, but not in great detail. By analogy the supportive defenses correspond to the supportive therapy and the refutational defenses correspond to the biological inoculation.

McGuire utilized two types of refutational defenses, refutational-same defenses and refutational-different defenses. Refutational-same defenses present and refute the same arguments that are found in the subsequent attack, whereas the refutational-different defenses present and
refute completely different arguments from those in the attack. The theoretical prediction for the relative efficacy of the refutational-different defenses evolved out of the refutational-same pretreatments. Papageorgis and McGuire (1961) predicted a generalized immunity using refutational-different defenses, noting that such "generalized immunity" could derive from either of two mechanisms:

Preexposure might shock the person into realizing that the truism he has always accepted are indeed vulnerable, thus provoking him to develop a defense of his belief, with the result that he is more resistant to the strong counterarguments when they come. Alternatively, the refutations involved in the preexposure might make all subsequently presented counterarguments against the belief appear less impressive [p. 475].

A second variable that was experimentally manipulated was amount of active participation required. In the passive condition, subjects were required to read defensive messages that had been prepared by the experimenter. In the active condition, the subjects wrote the defensive messages themselves, in either a guided or unguided condition which determined the amount of help to be received in constructing the messages. McGuire and Papageorgis (1961) predicted that "the immunizing pretreatments would lose effectiveness to the extent that they required the person to participate actively, without guidance, in the defense [p. 337]." The theoretical basis for this prediction argued by McGuire and Papageorgis is that because of the individual's lack of practice he performs so poorly in
the active condition as to actually obtain little or no practice, making the active condition self-defeating. The total result is to make the individual presumably aware of his own inadequacy at defending his belief. Thus active defenses gain their strength from their motivating effects. Inversely, passive defenses used in conjunction with refutational-same defenses contain an intrinsic threatening component that motivates the individual to defend his belief, thus accounting for the relative superiority of the passive defense condition over that of the active defense condition. Insko (1967) interpreted the superiority of the passive defense over the active in the following way:

Passive defenses gain their strength from, first, immersing the individual in the relevant material, and, second, with refutational defenses at least, motivating the individual to bolster his defenses. Active defenses, on the other hand, gain strength only from their motivating effects [p. 308].

A third defensive variable studied by McGuire manipulated the interval of time between the pretreatment defense and the subsequent counterattack. According to McGuire, the threatening component of a defense (refutation-al-same) manifests a nonmonotonic trend over time. That is, for some time after the initial inoculation the individual continues to assimilate belief bolstering information, increasing resistance to counterpersuasion. This particular belief manifests an initial rise, with a
sharp decline, similar to that of the biological inoculation. As the motivational component becomes less salient and begins to fall off, there is less demand on the individual to assimilate belief bolstering information. Similarly, active defenses which contain intrinsic threatening components manifest nonmonotonic persistence.

Passive supportive defenses, however, lack the intrinsic threatening component and confer resistance strictly on the basis of direct communication of belief bolstering material. This means that passive supportive defenses show monotonic persistence; i.e., the resistance decreases regularly over time. Passive refutational-same defenses, on the other hand, contain some elements of both, resulting in a composite effect. As the nonmonotonic trend begins to increase, the monotonic trend gradually decreases. Over time, however, the persistence diminishes, with both the monotonic and nonmonotonic trend turning downward. The impact of this particular study, and other theoretical implications will be discussed in greater detail later in the study.

Basic Procedure

The systematic exploration of resistance to persuasion begun by McGuire and Papageorgis (1961) was quite similar from experiment to experiment. Without exception, the experiments required two sessions, with the first
devoted to the defensive message, the second, to the subsequent counterarguments and measurement of the belief levels. The studies were usually presented as either reading comprehension tests designed to test critical reading and thinking skills, or more simply, verbal skills. The cultural truisms selected from the area of health practices were used throughout, and the subjects were college students fulfilling a core course requirement that they participate in a certain number of experiments.

First Session

In the first session, all of the defenses were administered in test booklet-form with each subject receiving a number of defenses, each defense representing a different health truism. Depending on the particular experiment, the subject was exposed to one or more combinations of defenses including passive-supportive, active-supportive, active-refutational, or passive-refutational. Passive defense conditions usually allowed the subject five minutes to read the message and to select and underline key phrases or clauses in each paragraph. In the active defense conditions the subject was given 10 minutes to refute counterarguments.

Second Session

Within two to seven days after administration of the defensive pretreatment, a second "attacking" session
followed. In some experiments the attacking treatment was immediately contiguous. In most cases, the second session, like the first, allocated 50 minutes for the completion of reading or writing tasks and administration of an opinionnaire. The messages were similar to the defensive messages in format and style, containing three paragraphs of approximately 200 words each devoted to the truism. In the second session, however, the first paragraph restated the truism and noted that some people were beginning to question the advisability of such practices. Two attacking arguments were mentioned in the first paragraph, with each of the two following paragraphs developing in detail one of the counterarguments. In most cases the designs had each subject supply control data on a "defense only" and a "neither-defense-nor-attack" condition, with the health truisms being rotated around the conditions between subjects. At the end of the second session, subjects responded to the opinionnaire which contained statements dealing with the truism. The subjects were required to check their degree of agreement or disagreement with the proposition on a scale ranging from one to 15. After each experiment the subjects responded to a standard post-experiment questionnaire designed to test their perception of the intent of the experiment.
McGuire and Papageorgis (1961) demonstrated conclusively that refutational-same defenses are superior to, and produce greater resistance to attacking arguments than do defenses using only supportive messages. The experiment was conducted in two one-hour experimental sessions. The first session was devoted to giving the subject belief-immunizing treatments; the second, 48 hours later, exposed him to strong counterarguments attacking the beliefs. In the first session each subject was given a defensive treatment with instructions to write a 1000-word essay defending the belief in 20-minutes. After the 20-minutes were up subjects were given a second defensive treatment, which required that the subject read for five minutes a 1000-word essay on another cultural truism and answer some questions relating to the content. The subject's final task was to complete an attitude questionnaire designed to measure the strength of the belief. In the second session 1000-word essays containing strong counterarguments against each of the previously (and one additional belief) were presented. Besides the reading and writing manipulation, other manipulations had to do with whether the subject wrote the essay with the aid of an outline or without an outline, and whether the defenses were supportive or refutational.
The mean belief level score for the supportive defenses was 14.34, and the mean belief score for the refutational defenses was 13.91. The supportive defenses appeared to have had more immediate strengthening effect than the refutational defenses, although it did not approach traditional significance levels. McGuire refers to this phenomenon as the "paper tiger" effect. That is, the supportive defense, prior to the strong counterargument, increased the mean belief level to a point higher than that of the refutational defense, although the direct strengthening effect was not predictive of the defenses immunizing effectiveness. When refutational defenses preceded the attacks, the mean belief score was reduced to only 10.33, \((p=.001)\) significantly higher than the corresponding attack-only condition. In the supportive condition, however, the belief was reduced to 7.39, significantly lower than the refutational-same defense condition, but not significantly higher than the no-defense, attack only condition. The results confirm the experimenter's prediction of the superiority of the refutational-same defense over that of the supportive defense.

Refutational-different defenses. Papageorgis and McGuire (1961) tested a third defense, refutational-different, in which weak arguments related to, but different from the ones refuted, were presented in the counterattacking session. The author's predicted that refutational-differ-
ent defenses would be as effective as the traditional refutational-same in inducing resistance due to the implicit threatening component found in both of the refutational-type defenses. According to the author's "such a generalized effect was hypothesized to be the result of lowering the perceived credibility of later attacks...and stimulating the person to think up supporting arguments... [p. 481]." Stimulation of the individual's belief system should generalize to attacking arguments other than those specifically refuted in the refutational defense, conferring resistance against an attack utilizing nonrefuted arguments. In this experiment, only passive reading arguments were used with the main comparison being between refutational-same and refutational-different defenses. In addition, the defensive paragraphs were shortened considerably, with the interval between defense and attack increased from two days to one week. The results agree with the predictions of the authors. The obtained "neither-attack-nor-defense" mean belief level was 13.23. In the refutational-same and refutational-different defenses the mean belief levels were 9.25 and 8.70 respectively. Statistically, the means do not differ from each other significantly, but both are significantly greater than the attack-only mean of 5.73. Measures included in the present study produced an indication regarding the quality and the credibility of the messages, revealing that
the strong counterarguments were rated lower by subjects who had received immunization than by those who had not. The attacks were seen as significantly less credible \((p=.05)\) when preceded by either of the refutational defenses than when not preceded by a defense.

*Attack-Forewarning manipulation.* McGuire and Papageorgis (1962) report on the first of a two-part study designed to investigate the effect of attack-forewarning in inducing resistance. This manipulation "involves announcing to the person in advance of the defenses that his belief will subsequently be exposed to strong attack versus...no announcement [p. 26]." The forewarning condition was subsequently labeled "white" propaganda, and the no-forewarning condition was labeled "black" propaganda. The authors predicted that the immunizing capability of the defenses would be enhanced by the threatening warning of the white propaganda. In addition, they also predicted that the supportive defenses would gain the most by the forewarning component than would the refutational defenses. Ninety-six subjects received the supportive, refutational-same and refutational-different messages, with half serving in the forewarning condition and half in the no-forewarning condition. In the forewarning condition the subjects were told that the experimenter was interested in measuring how susceptible to persuasion they were, and that after reading the defenses they would be exposed to strong counterargu-
ments. In the no-forewarning condition, the introduction was presented in the usual manner.

As predicted, the mean belief for the combined defenses with forewarning (11.67) was significantly greater than the combined mean belief level without forewarning (10.93). The supportive defense, as hypothesized, was enhanced due to the forewarning significantly more so (p=.05) than in the refutational defense conditions.

Prior reassurance manipulation. Anderson and McGuire (1965) conducted an experiment, which asserted basically that prior reassurance would have the opposite effect on the defenses as manipulating forewarning. The prediction follows:

That to stimulate the person to develop his defenses and acquire resistance to persuasion, it is necessary to threaten him, rather than further reassure him, about the validity of his belief. Therefore, giving the believer prior reassurance that his belief is true (by giving him feedback that his peers are in complete agreement with him about the truism's validity) weakens the immunizing efficacy of the defenses [p. 44].

Theoretically, manipulating the predefense manipulation would produce overconfidence so that the defensive material is not assimilated, reducing the immunizing effectiveness of the various defenses. From this theoretical framework, the authors further predicted that the supportive defense would have a tendency to lose most from such manipulation, since the "overconfidence" would be
overcome by the intrinsically threatening component found in the refutational defenses.

After indicating their beliefs toward the medical truisms on 15-point semantic differentials, subjects were given false information regarding the group average for the same truisms. The subjects were told to mark the group averages on the scales in the booklets to expedite key-punching by IBM clerks at a future date. The feedback means were very high on four of the truisms (14.50), indicating complete agreement with them. On another four issues, the subjects heard low group means (7.50), indicating substantial doubt about these truisms. No feedback was given to another (control) group. All subjects served in three experimental conditions (refutational-different, refutational-same, and supportive) and one of two control conditions.

As anticipated, all three groups were more effective in inducing immunization under conditions of no-reassurance. Under the reassurance condition, the mean beliefs were 11.52, 10.80, and 9.58 for the refutational-same, refutational-different, and supportive defenses, respectively. The supportive defense was reduced more under conditions of reassurance than were the refutational defenses.

In an earlier study, McGuire (1963a) manipulated the variables previously reported, threat and reassurance,
in an effort to determine whether the immunizing efficacy of refutational defenses actually derived from the threatening component. According to inoculation theory, the threatening component is technically the most important one since it motivates the individual to bolster his belief through assimilation of information. Manipulating both reassurance (high or low) and threat (high or low), the author confirmed that the subjects in the high threat condition were more resistant (11.02) to subsequent counter-attacks than in the low threat condition (10.14). Similarly, there was more resistance in the high reassurance condition than in the low reassurance condition.

Persistence of the resistance to persuasion. McGuire (1964) investigated the "effect on resistance of varying the time interval between the defense and the attack [p. 241]." The investigation was undertaken to determine the rate of decay over time for each type of defense. As previously discussed to some extent, McGuire predicted that the refutational defense would retain its superiority, since the refutational defense contains a threatening element. The author's expectation was that the supportive defense would not only be inferior in this respect, but that it would decay much more rapidly than that of the refutational defense. Another prediction followed that decay would occur more rapidly against attacks by the same counterarguments explicitly refuted than against novel
counterarguments. On the basis of induced motivation, which increases over time, McGuire asserted that the "novel counterarguments should tend to catch up over time with resistance to the very counterarguments refuted [p. 242]."

The results confirmed McGuire's predictions that the supportive defense would confer less resistance to the attack whether the attack came immediately, two days, or one week after the attack. When the attack came two days after the defense, the superiority of the refutational over the supportive was very pronounced ($p = .001$). The second prediction was likewise confirmed. Although the refutational-different defense was inferior ($p = .05$) to the refutational-same when the attack was immediate, the refutational-different defense was trivially superior to that of the refutational-same when the attack came two days later.

McGuire (1961a) also investigated the sequential and combinational effects of defenses. The study is mentioned here only briefly, since its relevance for the present study is of limited value, and with the exception of the combinational effects, the results do not generally adhere to the biological analogy originally proposed. As hypothesized, McGuire found that the supportive and refutational defenses combined were significantly more effective than either alone. When approached more from a medical analogy than that of McGuire's biological inoculation
analogy, the results become more meaningful. Analogously, combining supportive therapy (rest, vitamin supplements, good diet) with inoculation against a specific disease presumably will make the individual more resistant to an attack of that virus. The sequential effects, however, were not supported. The passive-active and active-passive sequences employed were nearly identical for both of the refutational defenses.

*Congruity Principle Strategies*

One of the most frequently cited approaches to the reduction of attitude change is suggested by the congruity principle model (Osgood & Tannenbaum, 1955). Developed to account for attitude change in a general communication setting, and frequently applied to other cognitive areas, the congruity principle holds that "the existence of an incongruent communication situation--e.g., when a favorable source makes a negative assertion about a favorable concept--leads directly to attitude change [Tannenbaum & Norris, 1965, p. 147]." The communication situation to which the congruity principle was originally applied is "one in which an identifiable source makes an assertion about some concept or object [Tannenbaum, 1967, p. 273]."

Tannenbaum (1967) observed that sources and messages are evaluated in light of each other. When the source and concept are brought into an evaluative relation-
ship to each other, with the source assuming either a favorable or unfavorable position to the concept, only then does the principle of congruity arise. Source and message evaluations change depending upon the relationship between the two. Under certain conditions, however, e.g., when a favorable source makes a positive assertion about a favorable concept, no incongruity results, and no measurable pressure towards consistency is generated. Under other, more typical communication settings, however, an unfavorable source makes a favorable assertion about a negative concept. In this example, a fundamentally incongruous situation results, generating pressure to change the basic attitudes toward the cognitive objects of judgment. In other words, attitude change is generated in the direction of increased congruity, or decreasing incongruity. As such, the congruity model attempts to predict the direction of change.

Although it is not the intent of this paper to evaluate the merits of the congruity model, it should be noted that the theory has been criticized for two reasons: 1) its unreliability in predicting the results of the magnitude factor, and 2) for its deficiency in predicting cognitive interaction based only from a knowledge of the properties of the components in isolation (Rokeach, 1968).

During the decade of the 1960's, Tannenbaum sought to apply the congruity model to the reduction of persuasion,
closely paralleling the resistance to persuasion experiments initiated by McGuire. Tannenbaum reasoned that "any means of reducing the degree of incongruity in a situation serves to reduce the degree of attitude change [1965, p. 147]," thereby creating resistance.

Tannenbaum, Macaulay, and Norris (1966) explored four strategies for reducing persuasion, appropriately labeled denial, source derogation, refutation, and concept boost. The strategies are described in some detail below.

**Denial.** This particular strategy, as operationalized by Tannenbaum *et al.* (1966) involves "severing the cognitive link," or dissociating the source from the concept. The strategy took the form of a United States Public Health Service press release, denying statements which had been erroneously attributed to the agency. The central notion of this strategy is to negate the impression that a particular source is against a particular concept. A greater degree of congruity would result if the source were to make an assertion directly opposed to the main attack.

**Source derogation.** This strategy took the form of an Associated Press release attacking the United States Public Health Service as "incompetently staffed, riddled with political appointees, and generally not serving the public interest [1966, p. 234]." Other variations of the above communication message were employed in later studies. If a favorable source makes a negative assertion about a favor-
able concept, according to the congruity model, a more congruous situation would obtain if the source were also evaluated negatively.

Refutation. A detailed refutation of the attack message was in the form of either the American Medical Association or the American Dental Association, depending on the issue, offering a point-by-point rebuttal. Tannenbaum reasoned that one "way to lessen attitude change would be to weaken the assertion as such [Tannenbaum, 1967, p. 281]." The author calculated that weakening the assertion could be accomplished by causing the subject to question the validity of the attack, or through totally rebutting, perhaps even reversing the main points of the attack. Such a procedure would have the effect of making the attack message less incongruous, impeding or inhibiting subsequent attitude change.

Concept boost. Bolstering was identified as part of a statement attributed to a highly credible special committee of a professional association, offering evidence in support of the truism. No reference was made to any of the counterarguments.

Bolstering, similar to McGuire's supportive defense, works on the principle that "if the initial attitude toward the concept can be boosted...it should be less susceptible to subsequent persuasion attempts in a negative direction [Tannenbaum, 1967, p. 282]."
Tannenbaum and his associates found that three of the strategies employed, source derogation, refutation, and concept boost treatment, were effective in immunizing against persuasive attempts. Generally speaking, the results indicate that the concept boost mechanism and the refutational treatment are more effective than are either denial or source derogation as strategies for the reduction of persuasion. Tannenbaum, Macaulay, and Norris are credited, however, with pointing out some of the inconsistencies in their study. They noted that the results of the study could have been attributed to differences in the messages used to evoke these various mechanisms (length, format, source, etc.) so that conclusions based on the differences between treatments would be tentative.

It is especially interesting for the purposes of the present study that the concept boost (supportive) and refutational treatments produced the greatest amount of resistance in the Tannenbaum et al. studies. These are the same treatments utilized by McGuire repeatedly in his systematic investigation of resistance to persuasion. In both the Tannenbaum and McGuire studies, the refutational treatment emerged as clearly the most superior in reducing persuasion. In fact, the refutational treatment contains the main focus of McGuire's inoculation theory, which asserts that the individual is both unpracticed and unmotivated in defending his belief. The inoculation
procedure is to provide the individual with both motivation and material "by making him aware of the vulnerability of the truism [McGuire, 1964, p. 202]." By alerting the individual's defense system of possible attacks, then rebutting the attack, it provides motivation, material, and ultimately, resistance to the counterpersuasion.

Tannenbaum has accepted the basic tenets of the McGuire inoculation theory, but contends that it is as a result of an entirely different mechanism, or perhaps, a combination of mechanisms. According to the congruity theorists, "inoculation" is accomplished through the assertion-weakening attributes of the refutation treatment. In other words, through a "point-by-point explicit countering of the attack arguments, the attack is rendered invalid [Tannenbaum, 1967, p. 292]."

Tannenbaum (1967) cites other mechanisms which may contribute to the resistance-producing refutation treatment:

Both explicitly (by actually stating so outright) and implicitly (in the act of providing counterarguments to those raised in the attack), the refutation may serve to strengthen and intensify the belief, much in the manner suggested for the boost strategy itself. Such opinion intensification (or similar effects on other possible components of the attitude; cf. Guttman, 1954) may then help blunt the impact of the subsequent attack [1967, p. 292].

Four principle mechanisms for accomplishing reduction of persuasion are indicated: the threatening component of the refutation which motivates the individual
to assimilate information; defense-alerting and/or defense-providing aspects of inoculation; assertion-weakening and concept-boosting. Tannenbaum reasons that all four mechanisms could easily be used to explain the reduction process, and that due to a lack of direct measure of the mechanisms in question, all explanations are necessarily tentative.

Manis and Blake (1963) have proposed a fifth defensive mechanism which is theoretically evoked by the refutation messages. Hypothesizing that "attack-only control subjects attempt to maintain their initial attitudes displacing the perceived position of the attack toward their own positions [1963, pp. 226-228]," the authors interpret this cognitive interaction as "perceptual defense." The mechanism proposed by Manis and Blake for interpreting the efficacy of the refutation defense works through reducing the perceived disparity between the attacks and refutations. Other explanations and interpretations for the reduction of persuasion have been explored by the dissonance theorists. In addition, a number of consistency models offer plausible explanations for the mechanism whereby reduction of a persuasive communication is achieved.

It is immediately apparent that a number of mechanisms exist to explain the process of defensive resistance. It is equally apparent that any of these mechanisms may be
the most important mechanism, although empirical support for some are more well established than for others. Few researchers would deny that the mechanisms suggested by McGuire are in any way undesirable or incompatible with the mechanisms suggested by Tannenbaum, or Manis and Blake. Although the present study relies more heavily on the interpretation provided by McGuire, this does not preclude the possibility that other mechanisms are in operation. Greater attention will be paid to these competing theories in later chapters, as will the work accomplished by Tannenbaum related to source manipulation.

Source Credibility: An Elusive Variable

Over the past 25 years, research in the combined fields of attitude formation and change, persuasion, and of late, resistance to persuasion, has proliferated at a staggering rate. Source credibility, without exception, has been a major experimental variable in the majority of these research efforts. Countless researchers have manipulated the source variable with varying degrees of success. Far too often, it has been overused, and more often than not, misused. Results which defy interpretation have been attributed to the effects of source credibility. It has been examined by researchers ranging from Haiman (1949) to Miller (1972). Still, source credibility research remains elusive and deficient. A review of
some of the more important studies in this area should prove helpful as a framework for the present study.

Hovland, Janis, and Kelley (1953) defined source credibility as:

The extent to which a communicator is perceived to be a source of valid assertions and the degree of confidence in the communicator's intent to communicate his assertions he considers most valid [p. 21].

The most definitive work in this area from the point of view of the above definition, is the classic work of Hovland and Weiss (1951) in which it was found that a communication arguing the feasibility of atomic submarines was much more effective when attributed to J. Robert Oppenheimer (previously rated as high in credibility by the audience) than when attributed to the Pravda (previously rated as low in credibility).

In more recent times Lemert (1968) has taken issue with Hovland's definition, criticizing it on the basis that "perceived expertness" also carries with it strong elements of prestige, not included in the Hovland definition. Similarly, Lemert observed that "if credibility is only part of the total arsenal of an effective source, how useful is it to merely impose a superstructure on these two source variables (trustworthiness and expertness) [1968, p. 31]?" Lemert, recognizing that Hovland's definition was far too limited, conducted a factor analysis study of source credibility, with a "holistic" view of source
credibility. The definition adapted by Lemert for source credibility was one of the first attempts to overcome the earlier view (Kelman & Hovland, 1953) in which bias was varied under the heading of credibility, and that of Freeman, Weeks, and Wertheimer (1955) in which a measure of liking was considered credibility. Lemert stated that source credibility consists of "dimensions which are based on relations among the ways audiences respond to sources, and is as such a perceived property [p. 4]."

Such a holistic view of source credibility has since been accepted by most of the researchers in the field including Miller (1969), Berlo, Lemert, and Mertz (1969), Andersen and Clevenger, Whitehead, Giffin, McCroskey, Zagona and Harter, and others. Traditionally, source credibility has been treated as a variable consisting of objective characteristics (social role, personality, sex, etc.) attributed to the source of the message. The newer and most recent approach propounded recognizes that the perceived credibility of a given source is not dependent upon objective attributes, but rather upon the way a receiver perceives these attributes. The importance of an auditor's response to the interaction of source and influence attempt, clearly has more impact when viewed "holistically." Each receiver must be regarded as responding *individually* to the source. That all receivers respond the same to messages from the same source no longer can be held. Thus,
such generalizations as: "A message generated by a low-credible source will have less impact than a message attributed to a highly-credible source" are clumsy, and greatly in need of refinement. The point of view projected in this treatise adopts the holistic theory of source credibility projected by Lemert, and attempts to take into account the function of a receiver's perception in the communication transaction, simultaneously recognizing the cumulative research of earlier investigators.

Fixed ethos models. As previously noted, a number of studies have employed relatively fixed models of ethos in constructing experiments on attitude change. Arnett, Davidson, and Lewis (1931) found that an experimental group of graduate students shifted in their opinion of agreement with graduate educators on Harper's test of liberalism. Hastorf and Piper (1951), and Haiman (1949) similarly used fixed ethos models of source credibility in assessing attitude change. Haiman presented to three groups of students a tape recorded speech attributed to either Thomas Parran, Surgeon General; Eugene Dennis, Secretary of the Communist Party; and to a "Northwestern University sophomore." Parran was rated significantly more effective and competent, and attitude shift was significantly greater than in either of the other two conditions. The same technique was later employed by Strother and Paulson (1951). Meanwhile, Hovland and Mandell (1952)
manipulated credibility through the suggestion of different degrees of selfish interest (biased and unbiased sources).

_relevant and irrelevant characteristics_. Other ethos models have examined the relevant and irrelevant characteristics of sources, and their subsequent effect on attitude change. Kraus (1960) compared Whites with Negroes to test their persuasiveness. Using pairs which were racially homogeneous and pairs which were racially heterogeneous, Kraus found that arguments favorable to integration were more persuasive when advanced by the heterogeneous (Caucasian and Negro) pair. The results were explained in terms of differing levels of source credibility.

McGinnies (1968) manipulated sex, national origin, personal involvement and source credibility in a study conducted at the National Taiwan University and found that "subjects who displayed the greatest susceptibility to persuasion were the low involvement Taiwanese students who were exposed to the high-credibility source [p. 177]."

Similarly, Harms (1959) showed that listeners can hear a taped voice, and presumably, without any further information about the speaker, assign reliable source credibility ratings which correlate with the actual dimensions of speaker socioeconomic status. Such findings are, however, consistent with the earlier findings of Allport and Cantril (1934) who observed that physical characteristics, and occupation are usually perceived correctly just by
hearing a person speak. Addington (1971) investigated the effects of sex of the speaker and four vocal variables—“speaking rate, pitch, variety, voice quality, and articulate—on three dimensions of source credibility [p. 242],” however, and found no difference in credibility between male and female speakers due to differences in their voices. Closely related to the foregoing discussion is the work of McCroskey and Dunham (1966) who sought to determine what the initial ethos level of an unseen, unknown, tape-recorded speaker in an experimental setting would be. The authors failed however, to measure their unseen, unknown, tape-recorded speaker’s ethos level! The reason given for this obvious oversight was that "it seemed doubtful that subjects could, or would, give meaningful responses to a scale concerning their opinions of an unseen, unknown, as yet unheard speaker [pp. 211-212]."

A number of other studies have also demonstrated that factors that are not directly relevant to the topic under discussion influence audience perception of ethos. As previously cited, Haiman (1949) found significant differences in shift of opinion and determined that changes in personal appearance and demeanor can produce ratings of likableness and physical attractiveness of speakers.

Aronson and Golden (1962) conducted an experiment to test the relative importance of objectively relevant and irrelevant aspects of communicator credibility on changes
in audience opinion. Manipulating both relevant and irrelevant characteristics of a speaker, the results indicated that both the relevant and irrelevant aspects of credibility are important determinants of opinion change.

Zimbardo, Weisenberg, Firestone, and Levy (1965) demonstrated that the influences of source credibility are often surprising and complex. The team of researchers varied the objective irrelevant characteristics of a communicator as he requested army reservists to eat a distasteful food (fried grasshoppers). Subjects who ate the grasshoppers were induced to do so through social conformity, with the objective irrelevant characteristics of the communicator having little to do with compliance. The results indicated that the degree of attitude change toward eating the objectionable food was significantly less when the communicator played a role perceived as that of a "nice guy" than when he played the role of a taskmaster and snob.

*Learning and attitude change.* Generally speaking, information generated by a high credibility source has been demonstrated to be more effective in producing attitude change than information attributed to sources of low credibility. In one study related to learning and attitude change, Weiss (1967) determined to overcome the requirement of "individual perceptions" by utilizing a consensus technique. Weiss asserted that "the experts (audience members) may differ in unanimity but not in expertness or relevance"
In an earlier study by Weiss, Buchanan, and Pasamanick (1964) the same technique was successfully used, although it should be pointed out that such a technique implies that source credibility is a rather static dimension. In both experiments arguments were claimed to be advocated by "the experts" (high credibility source) and by "half the experts" (low credibility source). The findings indicate that the "high consensus source" led to greater agreement with the material presented than did the low consensus source.

Zagona and Harter (1966) found that the communication was better remembered when it was attributed to low and high (rather than medium) sources. They also found that as credibility increased, the percentage of subjects agreeing with the communication increased.

Source credibility and discrepancy levels. Investigations of discrepancy levels between receiver opinions and those advocated by sources of varying levels of credibility, have been the focus of much research in recent years. Related research has been conducted investigating the discrepancy between message credibility and source credibility.

Hovland and Pritzker (1957) conducted an intensive investigation in which source credibility and discrepancy level was manipulated. Their results revealed the following:

A greater overall change in opinion in the expected
direction was produced by a large discrepancy than by a small discrepancy between the subjects' opinions and the opinions of the authority [high credibility] groups. In more general terms, communications that advocated a greater amount of change from an audience's view do in fact produce a greater amount of change than communications that advocate a position that is not much different from the position that the audience already holds [p. 127].

Aronson, Turner, and Carlsmith (1963) attributed communications concerning poetry to T. S. Eliot (high credibility) and a college student (low credibility). When the communication was attributed to the source of high credibility, attitude change increased as a function of discrepancy between position taken by the subjects and the communication. Bergin (1962) obtained similar results for self-ratings of masculinity-femininity which varied discrepancy levels with the sources. Choo (1964), however, found no interaction between source credibility and discrepancy level on the resulting attitude change. Opinion change increased with credibility and discrepancy, but the results reported did not approach traditional significance levels.

Most of the research in this area, with the exception of Choo (1964) tends to support the previous conclusions related to source credibility and discrepancy. Freedman (1964) conducted a study following Choo which tended to confirm the previous hypotheses. Freedman noted that "increasing the prestige of the communicator will make
rejection more difficult and should increase the level of rejection [p. 413]." The previous work of Tannenbaum (1967) and Osgood and Tannenbaum (1955) also tend to support the hypothesis that attitude change occurs because of perceived discrepancies between source and attitude issues.

Atwood (1966) took a different approach toward discrepancy level and source credibility. Atwood systematically varied the credibility of both the message and the source and found that "when a high credibility source gives a low credibility message, source credibility declines but the reverse does not hold... [p. 90]."

_Similarity and attitude change_. Research pertaining to the relationship between similarity and attitude change is voluminous. The relationship, as presently explained, is presumed to be mediated by attitudes toward the source. Similar sources are considered to be more credible than dissimilar sources. Marsh (1967), Minnick (1957), and Oliver (1957) report that similarity leads to trust and respect. Mills and Jellison (1968) confirmed that similarity leads to mutual attraction. According to Minnick (1957), the speaker "may effect attitude change not only by explicitly asserting that he shares interests, feelings, and beliefs... but by emphasizing similarity in origin... upbringing... work experience [p. 126]."
Message Credibility

Another variable which is presumed to have an effect on the credibility of the source has to do with the support of materials used in the message, e.g., citing authorities, explicit conclusions, documented evidence, etc. Weiss (1967) conducted research to determine whether the contribution of the communicator to the attitude-change effectiveness of the communication is dependent on the inherent cogency of the communication. No evidence was found to support this prediction.

McCroskey and Combs (1969) used an experimental treatment which consisted of exposure to one of three message analogy conditions: literal, figurative, or no analogy. All message conditions were paired with either a high- or low-credible source. The results supported the authors' hypothesis that a message containing an analogy produces greater attitude change than one not containing an analogy. Attitude change was reported to be higher when the message was attributed to a high-credible source.

Sikkink (1956) employed quotations, but neither attitude shift nor ratings of convincingness showed significant differences. Andersen and Clevenger (1963) likewise concluded that the use of quotations and authorities does not necessarily enhance ethos—as many theorists suggest.

In contrast, Cathcart (1955) found that arguments
used with or without documentation of authority, and documentation of the expertness of the authority all produced greater shifts of opinion than did arguments presented without this support. Speaker credibility, however, was not effected by the message manipulations. Giffin (1967) similarly reports on a study conducted by Ludlum in which the following were manipulated: a) acknowledgment of opposing arguments, b) leading thoughts rather than forcing, c) alleged facts consistent with known facts, d) material demonstrated to be recent, and e) the use of a number of self-praising statements. The speech employing the above mentioned elements was compared with a "straight argumentative address" and the latter was found to be more persuasive. Perceived ethos of the speakers in either case were not measured, and no effort was made to isolate the individual message components to test their efficacy in producing persuasion.

In contrast, King (1966) constructed messages that were designed to illustrate the ethos of the speaker delivering the message. In conditions of high ethos, the speaker demonstrably was a man of intelligence, expertness, good character and good will. Under conditions of low ethos, the speaker lacked confidence in himself, used vague, non-technical language, and lacked respect for the audience. Using Andersen's (1961) semantic differential scales, King found that a significant difference existed in the audi-
ence's response to the evaluative and dynamism dimensions. Attitude change was not measured.

**Source introductions.** The use of introductory messages for manipulating differing levels of source credibility has become a commonplace phenomenon in the literature associated with persuasion and attitude change. All too often, however, the same self-confident academicians who promote empirical studies in persuasion and attitude change, have failed to "practice what they preach." Empirical studies conducted by fellow researchers that demonstrate the superiority of one type of message strategy over another, that experimentally suggest the inclusion or deletion of certain message cues, are largely ignored. The result from such unscientific, piecemeal manipulation serves only to confuse future research efforts, while thwarting cumulative research accomplishments.

If the above denunciation of careless research leads one to infer that a "science of introductory messages" exists, nothing could be further from the truth. What actually does exist are a number of empirically tested principles, which if consistently applied, can assist both the novice and the veteran empiricist in adding to the body of knowledge. What are some of these findings? Can source introductions increase perceived source credibility? Answers to these questions and others can be found in the literature dating back to the 1940's. Haiman (1949),
Strother (1951), and Paulson (1952) all used source introductions with success in studying the effects of perceived competence on opinion change. Hovland and Mandell's (1957) work used introductions containing only suggested differences in speaker's self-interests, and these resulted in significant changes in ethos. Giffin (1967) reports on the findings of Andersen (1961), who demonstrated that three introductions of a speaker designed to establish varying levels of ethos were successful. Differences in the perceived ethos of the individuals were measured on the evaluative and dynamism dimensions of semantic differential scales. King (1966) conducted an experiment which produced similar results.

Hovland et al. (1953) observed that certain characteristics of the communicator may influence the receiver's perception of the speaker's expertness and intentions. Hovland and his associates suggested that perceived expertness may be influenced by age, position of leadership, and other similarities. Attempts to persuade, rather than simply informing, have also been shown to effect receiver perceptions. Such strategy evidently indicates to the listener that the communicator has something to gain through the persuasion.

Haiman (1949) has shown that:

Variations in the prestige of the speaker produced by varying the chairman's introductory identification of him, were found to influence significantly
the effectiveness of a persuasive speech in behalf of national compulsory health insurance [p. 227].

McCroskey and Dunham (1966), in summarizing some of the conclusions with regards to introductory material based on tension-reduction models, have noted that "introductions given speakers can modify their ethos [p. 461]." The tension-release model provides for predicting the direction of an audience member's attitude change toward a source if the audience member's attitudes toward the source, and the source's proposition prior to message stimulus are known.

Other researchers, Ward and McGinnies (1974), and Greenberg and Tannenbaum (1961) have both demonstrated the importance of source introductions by varying the position of the source information (before versus after). Ward and McGinnies conducted an experiment in which the credibility of the sources was varied (high and low) along with the sequence in which the credibility information was presented (before versus after). Early mention of the noncredible source was found to inhibit attitude change relative to later or no mention. This is in line with Greenberg and Miller's (1966) finding that prior mention of the negative source resulted in less attitude change than did delayed mention. This was interpreted as being due to a "forecasting effect" that the subsequent information might be unreliable.

Mills and Harvey (1972) similarly found that their
expert sources produced more attitude change when introduced before the communication than when introduced afterwards. According to the researchers "this superiority of the positive source, relative to late mention, presumably is due to the enhancing consequences of early mention (suspension of critical analysis, reduction of counterarguments, etc.) [pp. 52-55]."

Husek (1965) likewise conducted an experiment where 20-minute talks promoting favorable attitudes toward concepts relating to mental illness were directed at groups of students by a speaker introduced as an ex-mental patient. The talks were found to be more effective when the negative information was introduced at the end, and least effective when introduced before the speech.

Greenberg and Tannenbaum (1961) varied the location of bylines in several persuasive messages, and concluded that one would find greater attitude change when the byline appeared at the beginning or in the middle of a printed communication than when the byline appeared at the end.

Another communication device which has been used quite successfully in the introductory portion of persuasive messages is that of forewarning. Forewarning was used with a great deal of success by McGuire (1962). Festinger and Maccoby (1964) also demonstrated that in the "forewarned" condition "subjects were relatively uninfluenced by the speaker and rejected him more than in the 'personality'
condition where the speaker successfully influenced their attitudes [p. 359]." The authors interpreted the result as implying that, if persons are forewarned that their opinion will be attacked, they are better able to marshal defenses, and reject the speaker and his message. Infante (1973), and Kiesler and Kiesler (1964) report similar conclusions based on empirical research.

As previously noted, the picture in this microcosm of communication is by no means clear. A number of variables studied individually and in combination have been shown to have an effect on the perceived source credibility of a communicator. Far too many of the studies have confounded their research efforts by intermingling variables and message cues in the introductory message, making it all but impossible to isolate any of the several factors responsible for source perceptions. Still, a number of principles emerge that should be consistently applied by interested researchers. Certain demographic information (Hovland et al., 1953) seem to influence source perceptions, as well as the position of the introduction (early or late). It appears from all of these studies that an introduction for a communicator can make a difference in perceived ethos, but the material employed must be "extensive and quite impressive [Giffin, 1967, pp. 107-110]."

Factor-analytic studies. Over the past 15 years researchers have begun focusing their attention on factor
analytic techniques in conjunction with semantic differential or Likert scaling procedures to uncover the perceptual structure of source credibility. The approach in its simplest form is to ask subjects to rate a variety of sources on semantic differentials according to the factors supplied by the experimenter. The subjects' ratings are then factor analyzed for significance according to previously determined "loading" criteria. By way of review, Andersen (1961) found a factor that he labeled "Evaluation" (honest, moral, fair, sympathetic, reasonable, likable) and a factor labeled "Dynamism" (interesting, strong, fast, aggressive, active) (p. 73). Although his initial list of factors included 120 bipolar adjectives, he selected only 22 of these for the experiment. Andersen had students from the University of Wisconsin rate 16 living prominent persons on the scales provided. No specific topics or issues were associated with the sources. The first factor (evaluative) was selected since it composed 45.6 percent of the total variance. A second factor called "dynamism" had previously been isolated by Osgood, Suci, and Tannenbaum (1957) as "activity" and "potency" factors. The scales used in Andersen's experiment which accounted for the heaviest factor loadings were interesting-uninteresting, strong-weak, fast-slow, aggressive-unaggressive, and active-passive (pp. 75-76).

Another prominent factor-analytic study was con-
ducted by Berlo and Lemert and reported on in progress by Lemert (1963). Lemert used three types of sources called public sources, personally known sources, and public sources identified with an issue or topic (p. 5). A total of 83 bipolar adjectives were used in the Michigan State University study. Three dominant factors emerged in the factor analyses: "Safety (honest, openminded, safe, objective), Qualification (trained, experienced, informed, educated), and Dynamism (bold, colorful, frank, extroverted) [pp. 7-8]." A fourth, weaker factor, called "sociability" also emerged during the analyses.

In addition, there were several weak, but specific factors that emerged beyond the four general factors. These "weaker" factors were largely associated with the specific source used, e.g., public source or personal source. They included "Dedication" (concerned-unconcerned, interested-disinterested, and serious-joking (p. 9), and appeared only with the public source category. A second category with two specific factors, Kindliness and Meticulousness, emerged with the personal source solution. "Kindliness is best defined by the scales loading on: kind-cruel, aimless-purposeful, reputable-disreputable, certain-uncertain, valuable-worthless, thoughtful-thoughtfulness [p. 9]." Meticulousness loaded the highest on the orderly-disorderly dimension, with secondary loadings on dependable-undependable, careful-careless, serious-joking,
and organized-unorganized (p. 9).

A second factor-analytic study was conducted by Lemert in association with a Canadian colleague, M. J. White. Reported on as the "Canadian Study," the results were very similar to those obtained in the MSU sample. Without exception, the loadings were on the three factors previously reported by Lemert (1963).

Markham (1965) conducted a factor-analytic experiment at the Northern Illinois University on public sources using marker variables chosen from the work of Osgood, Suci, and Tannenbaum (1957), from Andersen (1961), and Kjeldergaard (1961). Three factors emerged, with two minor factor loadings, reported below:

1. **Abstract-morality** (2.73%): immoral-moral, wrong-right, dishonest-honest, unrealistic-realistic, uninformed-informed.

2. **Skill** (2.47%): tense-relaxed, unlikable-likable, careless-careful, unsure-confident.

3. **Openmindedness** (2.16%): subjective-objective, biased-openminded, boastful-modest.

4. **Speed** (1.81%): slow-fast.

5. **Extroversion** (1.73%): extroverted-introverted [Markham, 1968, pp. 60-62].

McCroskey (1966) used written introductions for two fictitious speakers, one of high-ethos design, the other of low-ethos design. Thirty items were developed for a Likert scale with factor analysis performed on the ratings of each of the two speakers. McCroskey reported two factors rough-
ly parallel to the qualification and safety dimension of Lemert (1961), "authoritativeness" and "character." Several replications were conducted, using a 40-item and 20-item Likert-type scales, which confirmed the previous factor-analytic findings. The reliability of the authoritativeness and character scales was reported by McCroskey at .978 and .975, respectively. The two McCroskey factors and their dimensions are reported in Table 1.

Although the McCroskey scale is generally considered reliable by most communication researchers, some specific criticisms of the scale have been offered by Giffin (1967) in a brief summary of factor-analytic work. Giffin criticizes the McCroskey scale for the "lack of appearance of a dynamism factor [p. 118]." Giffin's criticism seems valid, since McCroskey (1966) readily admits that he developed no items in his Likert-type scale which seemed to uncover the dynamism dimension. Giffin suggested that this dimension probably would not emerge in a written introduction, since "it seems logical that a visible speaker in action might be more conducive to bringing out audience perceptions of dynamism [p. 118]."

Lesser known, but equally significant studies have been conducted by Whitehead (1968) and Jacobson (1966). Whitehead used 65 bipolar semantic differential scales, some of which were borrowed from previous studies, others which were new scales, in an effort to analyze high or low
Table 1
Semantic Differential Scales

<table>
<thead>
<tr>
<th>Authoritativeness</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliable-Unreliable</td>
<td>Honest-Dishonest</td>
</tr>
<tr>
<td>Informed-Uninformed</td>
<td>Friendly-Unfriendly</td>
</tr>
<tr>
<td>Qualified-Unqualified</td>
<td>Pleasant-Unpleasant</td>
</tr>
<tr>
<td>Intelligent-Unintelligent</td>
<td>Unselfish-Selfish</td>
</tr>
<tr>
<td>Valuable-Worthless</td>
<td>Nice-Awful</td>
</tr>
<tr>
<td>Expert-Inexpert</td>
<td>Virtuous-Sinful</td>
</tr>
</tbody>
</table>

Note: Taken from McCroskey, 1966, page 72.
credibility sources. Two hypothetical sources were introduced via tape recording. The speakers were to speak on the topic "What Constitutes the Public Interest in Broadcasting?" One high credibility source was introduced as Professor David R. Price, a Ph.D. who had dedicated 10 years to the study of broadcasting. Price had served on several national committees, and was praised by several national newspapers and high officials for his civic contributions. The low credibility source was introduced as, Mr. Elwood Schwartz, ex-manager of a St. Louis radio station and high school dropout. The introduction also noted that Schwartz had been convicted of conducting fraudulent promotion contests and was fined by the Federal Communications Commission. To eliminate order effects, the introductions were varied, with some subjects hearing the high credibility speaker first, others the low credibility speaker first.

The three factors which initially emerged were similar to those found by Berlo, Lemert, and Mertz (1969), Lemert (1961), and Andersen (1961). The factors included trustworthiness, competence, and dynamism. A fourth dimension, however, previously undiscovered in factor-analytic work, revealed a perceptual propensity on the part of the subjects to identify with source objectivity. The emergence of this factor, according to Whitehead, demonstrates "that the subjects expected the high credibility source to
be openminded, objective, and impartial [p. 61]."

Similarly, Jacobson (1966) used the factor-analytic work of previous investigations and was able to isolate four indexes of source credibility, two credibility dimensions, authenticity and objectivity, and two non-credibility dimensions, dynamism and respite.

The totality of these factor-analytic findings indicates a new direction for research into concepts previously thought of in unidimensional terms. However, there is a danger to the availability of these scales. Researchers carelessly borrow these scales, partly due to the convenience of administering them, on the basis of assumed relevancy to the concept being judged. In fact, the work reported by Lemert (1963) provides *prima facie* evidence for the case in point. Lemert found that different factors, although in most cases relatively minor, emerged with different sources (personal, public with no topic, public with topic) in different contexts. Similarly, the lack of identification of a dynamism factor in McCroskey's experiment can be attributed to the fact that the sources were not viewed as living, breathing sources. The sources were presented only in written introductions, thus explaining the failure for that dimension to emerge as relevant to the concept. The point is, that readily available factor scales cannot be changed and exchanged as expeditiously as one would change the lug bolts on the wheel of a car. Such
a practice, like the previous practice of assigning levels of credibility, cannot contribute to the furtherance of our knowledge of these subtle cognitive processes. As Tucker (1971) has so aptly pointed out, "derivation of factors via factor analysis cannot provide an underlying structure that can be expected to remain invariant over concepts, subjects, time, cultures, or experiments [p. 187]." Tucker cautions against the use of such scales without the experimenter demonstrating that the scales are reliable for his study with each source and each concept.

Applbaum and Anatol (1972) demonstrated the truth of Tucker's caution by using 31 bipolar semantic differential scales submitted to three speaking situations. The speaking situations chosen for the study included a speech delivered to a classroom, a speech delivered to a social organization, and a sermon delivered in a church. The results confirm that the dimensions do not maintain a high degree of stability over situations. According to Applbaum and Anatol, the indication is that:

There are differences between the receiver's perceptions of what qualities a speaker should possess in different situations as reflected in different factors that arise in the various situations [p. 221].

In summary, a number of dimensions or characteristics perceived by the listener to be the dimensions of source credibility emerge. The communicator's intentions, reliability, objectivity, expertness, authoritativeness,
similarity, intelligence, and character seem to influence auditor perceptions of speaker credibility.

**High and low source manipulations.** That low credible sources are not as persuasive as sources of high credibility is a firmly held empirical generalization. This principle seems to pervade the literature associated with source credibility, yet little is known about the impact of either high or low sources and their interrelationship with persuasive messages, or other sources. The next section will review some of the research that has specifically focused on manipulating varying levels of source credibility in an attempt to assess the mechanisms that have been introduced to account for reported changes.

Some of the first studies conducted with an eye on manipulating high and low sources were accomplished by Hovland, Lumsdaine, and Sheffield (1949), Hovland and Weiss (1951), and Kelman and Hovland (1953). Although Hovland et al. did not manipulate sources per se, they did discover that members of an audience who believed the purpose of an Army orientation film to be "propagandistic" showed less opinion change than among those who believed the purpose to be "informational." Hovland and Weiss (1951) built on the Hovland et al. concept, and found that although the communication being judged was identical, there was a marked difference in the way the subjects responded to the message attributed to the high credibility source versus the low
credibility source (pp. 640-643. According to the Hovland and Weiss study:

Subjects changed their opinion in the direction advocated by the communicator in a significantly greater number of cases when the material was attributed to a 'high credibility source' than when attributed to a 'low credibility source' [p. 642].

The authors noted that although the difference immediately after the message presentation was significant, "the extent of agreement with the two types of source was almost identical four weeks later [p. 644]." Hovland contributed this result to the fact that initially, at least, the low credibility source interferes with both learning and acceptance, but the interference decreases with the passage of time, at a more rapid rate than the forgetting of the content. According to Hovland,

There was a decrease after a time interval in the extent to which subjects agreed with the position advocated by the communication when the material was presented by trustworthy sources, but an increase when it was presented by untrustworthy sources [p. 650].

On the basis of the Hovland and Weiss (1951) study, Kelman and Hovland (1953) predicted that if low source interference is forgotten over time, then reinstatement of the positive communicator would increase the extent of the belief at the delayed period, while reinstatement of the negative communicator would decrease agreement. The hypothesis was confirmed.

On a similar basis, Greenberg and Miller (1966)
investigated the interaction between immediate or delayed attribution of the message to the source. Greenberg and Miller reasoned that,

If... attribution of the message to a low-credible source prior to its presentation results in maximal audience resistance to persuasion, it seems reasonable that highly credible sources should have the opposite effect: attribution of the message to the source before its presentation should enhance its persuasion [pp. 134-135].

Greenberg and Miller asserted that low source credibility serves to immunize an individual's belief system by "forewarning that the information to follow may be unreliable [p. 127]." Forewarning of this nature was predicted to cause audience members to ignore the persuasive appeal and retain original attitudes. The prediction was substantiated, and the authors concluded that the effects of low credibility can be obviated by simply delaying the source identification until after the message is presented. Husek (1965), Greenberg and Tannenbaum (1961), and Mills and Harvey (1972), similarly found that a low credibility source identified after the message presentation was more effective in changing attitudes. Ward and McGinnies (1974) replicated the findings of earlier researchers attributing the effect of early mention of the noncredible source to "an inhibiting of attitude change [p. 21]."

A number of researchers, including several of those previously cited have directed their attention more towards the possible impact of the low credibility communicator.
Youtz, Robbins and Havens (1964), Allyn and Festinger (1961), Johnson and Izzett (1972), Brooks and Scheidel (1968), Brooks (1970), and Walster, Aronson, and Abrahams (1966) have all given extensive attention to the low credibility source variable in recent years.

Youtz, Robbins, and Havens (1964) defined psychological resistance as "a set state of readiness to react unfavorably to an attempt of persuasion [p. 45]," and posited that:

Such resistance seems to occur when the communicator is perceived as a devalued individual where a set is aroused to judge what he says as unfair or untrustworthy [p. 45].

Allyn and Festinger (1961) corroborated earlier experiments pertaining to the impact of the low credibility communicator and concluded that:

Since a person who reads a persuasive communication, or is a listener in an audience, cannot attempt to influence the source of the communication, there are only two immediate ways in which he can reduce this dissonance. He can change his opinion to a position closer to that advocated by the communication or he can reject and derogate the communication and the communicator. There is no rigorous derivation to be made here but one may argue that, if a person anticipates hearing a communication that will disagree with an opinion he holds strongly, he will approach the situation with hesitancy, suspicion, and perhaps some hostility. If he does approach the situation in this way, then it seems natural to expect that his first and easiest reaction will be to reject the communicator [pp. 35-36].

Johnson and Izzett (1972), in contrast to the conclusions of earlier inquiries, suggested that source cred-
ibility does not affect the attention to, or comprehension of, a persuasive communication. Instead, source credibility acts as an "evaluative 'set' influencing the subject's acceptance or rejection of the contents of the communication [p. 81]." This research further indicated that source credibility differences affect attitude change primarily under low ego-involvement conditions. According to Johnson and Izzett,

Under high source credibility the arguments presented are generally accepted as valid; however, under low source credibility the arguments are treated with suspicion and counterarguments are generated [p. 81].

Manis and Blake (1963) presented no evidence to the contrary of Johnson and Izzett's investigation, and generally concur with their observations with regard to the impact of the high credibility source. According to Johnson and Izzett, "under high source credibility the arguments are accepted as valid [1972, p. 81]," however, their investigation into communicator-recipient discrepancy revealed that:

Subjects who have not been immunized will tend to assimilate prestigious communicators towards their own position, regardless of the communicator-recipient discrepancy. The use of the high prestige source justified the assumption that the communicator's 'true' position on the attitude continuum was farther from the recipient's stand than he (the unimmunized recipient) had inferred [p. 226].

A plethora of related studies by Miller and Baseheart (1969), Miller and Hewgill (1966), Atwood (1966),
and others have shed revealing light on the interrelation-
ship of source and message variables. Miller and Baseheart
investigated the effect of a message containing social ap-
proval or disapproval cues in advocating voluntary blood
donations, while Miller and Hewgill examined the impact of
messages with fear appeal. In both experiments, the mes-
sage manipulation was combined with source credibility man-
ipulations. Taken together, the studies suggest that if a
source has high initial credibility, a strong fear message
will be more effective than a mild one, regardless of
whether the cues stress undesirable physical or social con-
sequences.

Walster, Aronson, and Abrahams (1966), meanwhile
demonstrated that "a communicator, regardless of pres-
tige...is seen as more credible when arguing for a position
opposed to his own best interest [p. 327]."

Atwood (1966) varied both message and source levels
to obtain further answers on the interrelationship of these
two variables. Among the Atwood findings were the follow-
ing:

1) Where the high credibility source delivered
the high credibility message, subject ratings
of source expertness, fairness and trustworthiness
were lowered from pre- to post-message ratings.

2) Where the low credibility source delivered
the high credibility message subject ratings of
source fairness and trustworthiness were raised
from pre- to post-message ratings.

3) Where the high credibility source delivered
the high credibility message and the low credibility source delivered the low credibility message subject ratings of source expertness, fairness and trustworthiness were unchanged from pre- to post-message ratings.

4) Subject agreement with the low credibility message was increased by the high credibility source; subject agreement with the high credibility message was not affected by source credibility [p. 93].

Two other well known studies concerned with source-message interaction warrant mentioning at this point. Brooks and Scheidel (1968) report source reversal after a number of high school subjects were exposed to a message. A tape recorded speech by Malcolm X was presented to a group of White subjects whose mean pretest evaluation of the speaker was favorable. The mean group response was 2.53 based on a seven point scale with 4.00 as neutral. The speech opened with a prayer to Allah for giving the Negro race the most honorable Elijah Muhammad, leader. Measurements taken immediately after the message revealed a significant shift toward more positive evaluations of Malcolm X.

In a second study, Brooks removed the prayer from the beginning of the speech and replaced it with a standard introduction taken from an original recording of one of Malcolm X's public speeches. Retesting revealed a favorable shift by those who were unfavorably predisposed initially.

From this foundation, Brooks wondered if the same
shift would occur with any speaker who produced an initially unfavorable response in an audience. Additional subjects were then pretested for their evaluation of speakers, including James Hoffa and George Wallace, both of whom elicited an unfavorable response at the time. A brief passage, approximately 30 seconds in length, was presented to different groups. The results indicated that the favorable response was not confined to just Malcolm X, but any speaker initially rated as unfavorable. Later, Brooks found that the early reversal also occurred with speakers initially rated favorable as well. Those subjects viewing the speaker favorably shifted in the unfavorable direction. Brooks noted that the mechanism whereby such shifts occur could be attributed to forewarning, low ego-involvement, stereotyping or a combination of all three mechanisms.

A final study by Tannenbaum (1967) has direct application to the present study. Tannenbaum sought to determine whether the influence of the refutation treatment was constant or whether it would vary as a function of the kind of source it was identified with. Tannenbaum predicted that:

If the refutation were identified as coming from a favorable source, its impact should be more pronounced and hence the resistance it may confer should be enhanced. On the other hand, if the refutation were issued by an unfavorably regarded source, the subject should tend to discount it, and its influence in reducing the attack's impact would be lessened [p. 295].
Utilizing the same messages constructed by McGuire (1961), a fictitious Dr. John Schmidt, Professor of Medicine, and an unfavorable *Truth and Health* magazine were associated with the refutational message. A control group was also used. All three groups received a main attack, identified as emanating from a favorable (high credibility) source. Both the favorable and unfavorable defense conditions conferred significant amounts of resistance against the favorable counterattack, the negative source conferring significantly less. (Means: refutation-positive source, 11.33; refutation-negative source, 8.37; attack-only, 6.38.)

In a second study, a favorable and unfavorable source were attributed to the attack treatment, with the only source of the refutation defense given as positive. The results indicated the following:

That when the two attacks are presented by themselves, the attack from the negative source leads to significantly less opinion change...When the refutation is presented prior to the positive-source attack, there is a marked diminution in the effect of the attack...When the refutation from the favorable source is combined with the subsequent attack from a negative source, there is an actual increase in favorability of attitude toward the concept [p. 296].

At this point it is apparent that the research in source credibility, albeit copious, is still being approached unsystematically far too often, and at times, unscientifically. First, many of the sources are chosen on an intuitive level and are assumed to be of either high or
low credibility. Equally often, the sources chosen differ in a number of dimensions other than credibility, but which may effect source perceptions. For instance, a few researchers would argue that George Wallace, Governor of Alabama, and Senator Edward Kennedy are equally credulous sources. To some political observers, Governor Wallace still generates a certain hostility, perhaps a carry over from his earlier position on racial desegregation. Although hostility in this case may not be part of the source's credibility, it certainly has an effect on the perception of that credibility. This example should serve to illustrate the point. Many researchers still choose their source, inferring that source credibility is a static concept that exists in a vacuum. Similarly, other researchers have reported experiments in which sources were chosen without concern for the message or topic attributed to the specific source. Once again, few researchers would argue that a garbage collector and a heart surgeon do not differ in source credibility on a number of dimensions, but is the difference relevant to the concept is the question that must be asked. For research purposes, both sources must be able to plausibly speak on the same topic. When empirical research is conducted on the basis of assumed credibility levels, without regards to topic or concept, no means are available for knowing whether the sources actually varied.
Secondly, sources used in most investigations have been either "high" or "low" without intermediate levels of credibility. Achieving the intermediate levels of source credibility obviously presents a problem, and explains the paucity of research literature pertaining to the effects of the "medium" source.

Another common mistake which has only recently come to the attention of informed empiricists, is the lack of factor-analytic congruency between experiments. Tucker (1971) has cautioned against assuming that the dimensions used in one particular study remain invariant across experiments, subjects, concepts, sources, and cultures.

Hovland and his associates conducted experiments on delay and reinstatement of the source cue, which points out another rather broad gap in experiments pertaining to attitude change. Standard procedure in this area has been for the experimenter to attribute a message to either a high or low credibility source after exposing the subjects to a written or taped biographical sketch of the source. Yet, in only several experiments have the auditors been reminded of the source within the communication and/or after the communication.

Source Credibility Summary

Through it all, a number of fairly stable predictions do emerge with regard to the impact of source credi-
bility. At the risk of oversimplification, a brief summary follows:

1) First, the higher the initial prestige of the source, the more likely the communication is to win short-term change of opinion.

2) The effects of high and low sources appear to dissipate with time, in the absence of source cue reinstatement.

3) High and low prestige is unrelated to the materials retained. The greatest learning seems to take place with "neutral" sources.

4) It also appears that the persuader and the message are intricately interrelated, and in the course of a persuasive attempt, audience attitude toward the persuader, message, or both may change. Early research efforts demonstrated that irrelevant characteristics such as age, demeanor, and dress may influence source perceptions.

5) Communications that advocate a greater amount of change from an audience's view do in fact produce a greater amount of change than communications that advocate a position similar to that already held by the audience.

6) When a high credibility source gives a low credibility message, source credibility declines, but the reverse does not hold true.

7) Similar sources are considered to be more credible than dissimilar sources.
8) Introductions given speakers can modify perceived ethos. Expert sources produce more attitude change when introduced before the communication, rather than afterwards, while early mention of low credibility sources tends to inhibit attitude change. Identification of a low credibility source after the message is more effective in changing attitudes.

9) A communicator, regardless of prestige, is seen as more credible when arguing for a position opposed to his own best interests.

10) A communicator's effectiveness can be increased if he initially expresses some views that are also held by his audience.

Statement of Hypotheses

At the conclusion of their 1961 study on inoculation, McGuire and Papageorgis made the following "alternative interpretation" of the obtained superiority of the reading (passive) condition over that of the writing (active) condition:

Even though no explicit indication of message source was given in any of the immunization communications, there was probably a strong tendency for the subject to assume that the essays presented for reading came from a high prestige source since their subject matter was rather technical and involved specialized information, and stylistically, they were well organized and literate [p. 334].
The reasoning behind the present study\(^1\) closely parallels that of the authors' in admitting that an intervening source variable could have contributed to the results. From a logical point of view, it seems that McGuire's subject matter may have been attributed either to the individual presenting the material, the organization (university), or to someone who had explicit enough knowledge of the field, e.g., a doctor or dentist, to construct the messages.

Several other reasons also prompted the study, in addition to that already cited. First, on the basis of experiments by Johnson and Scileppi (1969, 1972), it now seems apparent that "source credibility differences affect attitude change primarily under low ego-involvement conditions. Low ego-involvement, as operationally defined by Johnson and Izzett (1972) infers "a high acceptance set [pp. 81-82]." If it can then be assumed that the cultural truisms which were employed by McGuire (widely accepted beliefs) represent an uncontaminated belief strata, then it also seems logical that the source manipulation would not only be more manifest, but would result in far greater attitude change. Under such favorable conditions, the effect of both low and high source manipulation should be more

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evident than in a competing, highly ego-involved, controversial belief strata.

A third consideration is simply that application of the source variable to the inoculation paradigm is relatively unexplored. Tannenbaum (1967) manipulated first the attack source and then the refutational defense source under conditions of favorable and unfavorable sources, holding first the defense and then the attack constant. Never were the two conditions, favorable and unfavorable defense versus favorable and unfavorable counterattack, manipulated together. In addition, Tannenbaum used a health magazine as the unfavorable source and a professor of medicine as a favorable source in one condition. The refutation treatment or the attack, depending on the experiment, was alternately held constant under conditions of favorable source credibility. Factor-analytic work by Berlo, Lemert, and Mertz (1969) has since questioned the practice of combining personal, impersonal, and public sources, as was done in the Tannenbaum study. According to factor-analytic experiments, various types of sources load differently on dimensions of perceived credibility. This revelation would make the Tannenbaum series open to replication under generically compatible source conditions.

Upon close examination of the motivational mechanisms of the variables manipulated within the present study, a number of predictions can be made. With regards to the
message type, refutational-same defense and supportive defense, the predictions seem fairly clear. The works of McGuire (1961, 1961a, 1962) and Tannenbaum (1965, 1966, 1967) seem to confirm that the refutational-same defense is superior in conferring resistance against counterpersuasion. The reason for this according to McGuire is that the refutational-same defense, by mentioning and specifically refuting the same arguments to which the subject is later exposed to, threatens the individual and motivates him to assimilate the defensive material. Thus, by providing both the material and the motivation, resistance is conferred against the counterattack. The supportive defense, however, supplies only belief bolstering information without the intrinsic threatening and motivating components of the refutational defense. Theoretically, this boosts the individual's belief level, but leaves him poorly prepared to withstand a main attack.

The majority of the experiments in source credibility advocate the superiority of the highly credible source over that of the low credibility source. With some exceptions, sources of both high and low credibility have been considered separately, never as competing sources. The general procedure is to expose subjects to a message attributed to a highly credible source, followed by one attributed to a low credibility source. Some investigations are even contained within the scope of investigating just
one level of source and its impact. Tannenbaum (1967) noted that each source is evaluated in light of its message, however, the present author contends that the scope may be much broader than that expressed by Tannenbaum. Not only is each source evaluated with its message, but with any competing sources and their messages within the same spectrum.

Sources evaluated individually are known to act as mediating cues, cues for acceptance or rejection. Low credibility sources reportedly "inhibit" attitude change by forewarning that the information to follow may be unreliable and should be viewed skeptically. According to the present author, this should help to focus attention on the source's message under certain conditions.

High credibility sources, however, are concept boosting components that enhance attitude change. Sources that are perceived as being favorable signal that the information is reliable and can be trusted. Greater attitude change under conditions of high source attribution is, presumably, due to the reduction of counterarguing, and suspension of critical analysis.

It is safe then to assume on the basis of current knowledge that sources act as mediating cues for acceptance or rejection, providing the auditor with an "evaluative set." The source variable per se provides no additional motivating or threatening material, but may either enhance or
inhibit the assimilation of such material. On the basis of this reasoning, we may predict the following:

H1:

Refutational-same defenses will be significantly superior to supportive defenses in conferring resistance to a subsequent belief-reducing counterargument.

Under those conditions imposed by "inoculation theory" pairing defensive messages and counterarguments with sources involves a number of source-message combinations. The full gamut of source-message combinations was not explored by Tannenbaum (1967). Since each treatment combination evokes a different cognitive evaluative set for the auditor, a single all-encompassing predictor such as that projected by Ward and McGinnies (1974) seems insufficient. The Ward-McGinnies proposal that "low credible sources inhibit...while...high credible sources enhance [p. 17]," does not seem to adequately take into consideration all source treatment-message combinations that are found within the inoculation paradigm, indeed, in most "natural" settings. The general validity of this interpretation is recognized, however. Obviously, under certain message and context conditions, a low credibility source would not always "totally" inhibit attitude change. Likewise, it is generally agreed that attitude change in a natural setting does not always evolve out of one message from one source from one exposure, but through several ex-
posures from one or more sources utilizing different message strategies. Although the present study will not begin to tackle the myriad conditions in which source-message combinations are bonded to induce psychological resistance, it does attempt to predict and explain some of the several source-message combinations common to the inoculation theory. Therefore,

H2:

Refutation of arguments by a low-credibility source which are the same as those to which the receiver is later exposed to in a counter-argument message by a high-credibility communicator will enhance the low-credibility communicator's persuasiveness, conferring a significant degree of resistance.

Two mechanisms are postulated for the predicted result. The first, herein labeled source confirmation should receive its impetus from the attacking high-credibility source. In other words, audiences whose initial evaluation of a communicator are clearly unfavorable will tend to shift to the opposite direction when the receiver is later exposed to a counterargument message by a high-credibility source that argues those points specifically refuted by the low-credibility source. The counterattack by the high-credibility source should confirm that the points outlined by the low-credibility source are valid arguments, worth attacking by a highly evaluated source. The mechanism whereby psychological resistance is expected to be induced, may be attributable to the psychological demands found
in the communication setting. In the low source defense versus high source attack (LD-HA) treatment, a psychological demand is placed on the receiver to recall the defensive and motivating material presented by the low credibility source. It is expected that the psychological demand to recall the material is only present when a second, subsequent source of high credibility presents a message attacking the same points previously refuted by a low source. Under these circumstances it is expected that the two sources and their messages will be spontaneously and intimately associated. As a result of increasing the low credibility source's saliency and forcing recall of the defensive message, a significant measure of resistance is hypothesized.

Another mechanism whereby such a conversion could possibly occur is through source-message incongruity. As Brooks (1970), and Burgoon and Chase (1973) have noted, a source who is expected to argue in a low intensity manner, who is actually more intense, may be effective. The messages employed in this study, adopted from McGuire (1961), contain specialized knowledge, technical detail, and are overall, cogent. Auditor expectations of a message attributed to a low-credibility source should contrast markedly.

The third hypothesis predicts that:

H3:

Refutation of arguments by a low-credibility
source that are the same as those to which the receiver is later exposed to in a counter-argument message by another equally low-credibility communicator will diminish the low-credibility communicator's persuasiveness, suspending any significant degree of resistance.

This hypothesis logically follows from the prediction made in the first hypothesis. A refutation emanating from a negative source should produce no appreciable amount of resistance against a subsequent attack by an equally low credibility source. Although the points being attacked are still the same as those previously refuted by the low cred-ibility source, the fact that the attack is also attributed to a low credibility source is expected to impede recall of the defensive material. In other words, when the source configuration is one of a low defense versus a low attack (LD-LA), less likelihood exists that the sources will be spontaneously associated as in the first hypothesis. At-tribution of a low credibility source to the attacking mes-sage is expected to inhibit the psychological demand for recall of the defensive material. The result of the pre-dicted cognitive reaction would be to make the auditor highly vulnerable to an attack, even one emanating from an equally low communicator.

Similarly, hypothesis four predicts that:

H4:

Refutation of arguments by a high-credibility source that are the same as those to which the receiver is later exposed to in a counterargument by either a high- or low-credibility communicator,
will confer a significant amount of resistance.

The fourth prediction follows from the work of Tannenbaum (1965, 1967), Johnson and Izzett (1971), and Greenbert and Miller (1966). Attribution of a high credibility source to a refutational message should serve to bolster or enhance the concept. That is, a message emanating from a positive source should "enhance" the intrinsically threatening components of the refutational defense, thus contributing to the motivation for assimilation of the defensive information. In this condition, the refutational defense should prove equally effective against either a high source attack, or a low source attack, although it seems reasonable to expect less attitude reduction in the low source attack condition.

As previously noted, the attribution of a source does not add any degree of motivating or defense stimulating material—conditions that are necessary for inoculation to occur. Sources can, however, bolster or inhibit the effect of such material where it already exists. The fact that highly credible sources have demonstrated their ability to "boost" concepts qualifies their use in developing resistance to persuasive attempts under certain situations. In contrast, low credibility sources can be expected to impede assimilation and inhibit attitude change under certain specifiable conditions.

It should be pointed out that the above hypoth-
esized mechanisms for source effectiveness are empirical generalizations which have largely been developed by researchers under conditions less than those requiring spontaneous recall and association. The research efforts to date have failed to consider the persuasive impact of two or more source-assertions spontaneously recalled. By far, the majority of the source experiments have examined the source impact (with assertion) in isolation. Yet it seems highly unlikely that any long term attitude or opinion change could be expected to occur under such "artificial" conditions. A more realistic situation is one in which auditor exposure to a source-assertion is followed either immediately or within a relatively short period of time by a second, related source-assertion. Under these conditions spontaneous recall could be expected to occur, the source-assertion interaction and evaluation inducing change or resistance to change.

McGuire (1961) demonstrated the superiority of the refutational-same defense over that of the supportive defense beyond a reasonable doubt. The theoretical basis for this superiority is reportedly, due to the absence of the motivating and threatening components in the supportive treatment. From this vantage point, the source manipulation is not expected to be effective in conferring resistance in the supportive defense condition. It is conceded, however, that the attribution of a high credibility source
to the supportive defense treatment should result in significantly more initial bolstering of that belief than in the refutational-same defense condition.

The author realizes that this line of reasoning, however, represents a departure from the findings of Tannenbaum, as described in detail in the "Discussion" section. Nevertheless, unless the attribution of a highly credible source can be expected to raise the mean belief level significantly from the control group level, immunization is not expected to occur. In the absence of defense stimulating material a very large and significant increase is required to withstand the subsequent novel counterattack. Another explanation for this general prediction is the fact that the supportive defense, unlike the refutational-same, does not "mention and refute" the same points which are subsequently attacked. Under these conditions and in the absence of this specific "indexing cue", spontaneous recall and association are not expected. Consequently, immunization in the supportive defense was not predicted.

Method

General Procedure

Each subject took part in a 45-minute experimental session which was presented as a reading comprehension test administered annually by the Florida State Division of Testing. The booklets were duplicated in off-set style
printing and appropriately labeled, "York Reading Comprehension Test." The students were told that it was designed to measure comprehension skills. The subjects were also told that they should underline directly in the test booklet those passages and phrases that identified the main points. A time limit of five minutes per printed page of material was announced, with the experimenter stating the time remaining periodically to maintain the subterfuge. Subjects were told to work straight through the test booklet, and were not allowed to turn back to the previously read material.

The subjects were told in advance that a comprehension test and several related exercises pertaining to the written portions of the test were interspersed throughout the booklets, and that they should answer those portions quickly and continue on.

After completing the reading and source-rating portions of the test, subjects were requested to complete the opinion questionnaire that appeared at the end of the 14-page booklet. They were asked to indicate their personal beliefs on the issues regardless of what materials may have been presented in the test. These instructions were presented in the interest of "determining the extent to which the reading comprehension score obtained in this test is affected by the person's feelings about the topics discussed." Afterwards, subjects filled out a critique de-
signed to test the effectiveness of the manipulations. An effort was made after the experiment to explain the true purpose of the test and the deceits used.

Subjects
A total of 307 male and female students attending Florida Technological University during the Spring quarter of 1974 took part in the experiment. Of the students participating, 71 percent were freshmen and sophomores, 23 percent were juniors, and six percent were seniors, all enrolled in speech-communication courses. They constituted a rather heterogenous sample, including full-time and part-time students. Approximately 200 of the students were tested during their regularly scheduled class periods, with the remainder tested outside of class in a room reserved specifically for testing purposes.

Experimental Design
A total of eight experimental conditions were administered in the 2 X 2 X 2 factorial analysis of variance design, representing all possible combinations of the defenses (refutational-same and supportive) times the attack-source (high and low), times the defense-source (high and low). Control conditions for each of the message strategies, attack-only and defense-only, were also tested under conditions of high and low source credibility. A final control condition was administered under conditions of
neither-defense-nor-attack, with the subjects receiving a filler argument on the topic of air pollution.

Subjects in the after-only design were exposed to two different types of message strategies, supportive and refutational-same, under conditions of high and low source credibility message combinations. Each subject served in three randomly assigned experimental treatment groups.

Also included in the design were an equal number of control conditions for each of the previous experimental conditions (one for each source-message combination). (See Figure 1). The source-no-message (SNM) control groups were combined with the experimental groups and tested in the population at-large. The source-no-message control groups were initiated to measure the pre-message credibility level of each of the eight sources. Post-message source credibility levels were measured within the experimental treatment conditions.

The significance levels reported in the "Results" are based on analyses of variance where the error terms represent the residual variance in the conditions being compared after the treatment with individual differences removed. The .05 level of probability was established as the criterion level of significance. The design for data analysis is reported in Table 2.
# Experimental Design

**Figure 1**

## Defenses

<table>
<thead>
<tr>
<th>Sources</th>
<th>A1 (Refutational-Same)</th>
<th>A2 (Supportive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 (High)</td>
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### Attitude

### Scores
### Table 2
Design for Data Analysis

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<th>Message Condition</th>
<th>Supportive Defense</th>
<th>Refutational-Same</th>
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<tr>
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<td></td>
<td></td>
<td>-</td>
<td>N-N</td>
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</tr>
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</table>

Note.—Belief cells were analyzed in a 2 X 9 analysis of variance (AOV) to test the effects of source introductions on belief level. "Y" cells were analyzed in a 4 X 8 (AOV), while "Z" cells were analyzed in a 4 X 4 (AOV) to test the effects of authoritativeness and character (A--C).
Materials and Treatments

Booklet construction. A 14-page experimental booklet was administered to each subject. Each booklet contained three source combinations and two defense treatment conditions, with subjects serving in a total of three experimental treatments. Both supportive defenses and refutational-same defenses were contained in each booklet under varying source attribution levels. For example, a typical booklet contained one high credibility refutational counterattack (HRA), and two supportive conditions, low credibility supportive defense (LSD), followed immediately by a low credibility supportive (LSA) counterattack. All possible source combinations were exhausted, maintaining one supportive defense message condition, and one refutational defense message condition throughout.

The first page of the test booklet was labeled "York Reading Comprehension Test," followed by three paragraphs of instruction. The first paragraph indicated that the test represented one of several standardized examinations designed to "test your ability to critically analyze what you read." To maintain the facade, the booklets were printed in off-set type instead of the mimeograph form usually employed.

The second paragraph of the instruction sheet cautioned the subjects to read carefully and to "underline
directly in the test booklet those passages, phrases, or words that seem most important."

The final and third paragraph requested that the subjects "answer the questions that appear...based only on your own personal feelings, regardless of whether your opinion happens to coincide with the statements or not." The subjects were also reminded that the test would be timed, with five minutes allocated for each page of printed material.

Pages two, five, and eight of the test booklet were devoted to descriptions of the source attributed to the messages. The messages followed the source biography pages immediately (pages 3, 6, and 9), and contained the same information in the same style and format as employed by McGuire (1961). Pages four, seven, and 10 presented semantic differential type scales for the purpose of rating the source on a total of 12 dimensions of credibility. The seven-point scales were assigned bipolar adjectives of the type developed by McCroskey (1966), with one represented as *most* favorable, four as neutral, and seven as *least* favorable. In addition, the source cue was maintained throughout—in the introduction, within the message, and at the top of the source rating scale.

Pages 11 and 12 contained the "opinion survey" designed by McGuire with several filler propositions added. Subjects were asked to indicate their belief in each state-
ment by marking a 15-point graphic scale at the point between "Definitely false" and "Definitely true" which indicated their degree of assent with the statement.

The final and last page of the test booklet contained a standard "critique" of the test designed to measure how well the subjects had estimated the true intent of the exercise, with a reminder not to discuss the examination with those who had not yet taken it.

**Opinion measures.** Two of the four health beliefs tested by McGuire were selected on the basis of their previously demonstrated ability to be "widely accepted" by college-age audiences. The two beliefs were the following: "Everyone should get a chest X-ray each year in order to detect any possible TB (tuberculosis) symptoms at an early stage;" and "Everyone should brush his teeth after every meal if at all possible."

The beliefs on these issues were measured by the identical opinion questionnaire used by McGuire containing 17-statements, four of which touched on each issue. Two additional "filler" propositions were included to maintain the subterfuge utilized in the "neither-defense-nor-attack" control group. The subject was instructed to indicate his belief in the proposition by marking a 15-point scale (See Appendix E). For computation purposes, a numerical value of 15 was assigned to the end of the scale ("Definitely true") indicating concurrence with the belief, with a value
of one ("Definitely false") indicating rejection of the belief. Two of the items of the four employed with each belief were reversed. The scores reported in the "Results" section which follows are based on the average of the responses to the four items on the given belief.

Source measures. The McCroskey (1966) "Scales for the Measurement of Ethos" were utilized for the source assessment. The authoritative dimension was represented by the following bipolar adjectives: reliable-unreliable; informed-uninformed; qualified-unqualified; intelligent-unintelligent; valuable-worthless; and expert-inexpert. The character dimension also employed six dimensions including: honest-dishonest; friendly-unfriendly; pleasant-unpleasant; unselfish-selfish; nice-awful; and virtuous-sinful. For computation purposes, a numerical value of seven was assigned to the end of the scale indicating an unfavorable (low credibility) perception of the source, with a value of one (high credibility) indicating a favorable perception of the source. The scores reported in the "Results" section are based on the mean response to each of these six categories on both the authoritativeness and character factor.

The source measures consisted of seven-point

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2 The author assumes full responsibility for the use of this scale in the absence of suitable pedagogics on factor-analytic techniques. These scales were derived by McCroskey (1966) in "written introduction" contexts, and are logically applied in the present study on the same basis.
Likert-type scales ranging from one to seven. Subjects were advised to "rate the communicator (source) of the message which you have just read on the basis of your personal feelings, impressions..." A separate source rating instrument was provided for each source with the source cue reinstated directly above the scale.

Source messages. Four biographical sketches of fictitious persons containing approximately 600 words each were constructed for each defense treatment. Thus, the refutational defense contained a high credibility defense (HRD), with a corresponding high credibility main attack (HRA); a low credibility refutational defense (LRD), and a low credibility main attack (LRA). Similarly, the supportive defense contained a high credibility defense (HSD); a high credibility attack (HSA); a low credibility defense (LSD); and a low credibility attack (LSA).

In the refutational defense condition the messages were attributed to fictitious dentists (toothbrushing issue), while in the supportive defense (chest X-rays) the messages were attributed to hypothetical physicians specializing in radiology. To avoid exposure of the facade by today's increasingly sophisticated subjects, the biographical sketches were constructed from outlines appearing in the Journal of the American Dental Hygienists' Association and the American Medical Association Medical Review. In keeping with empirical findings related to "source introductions" the
messages were lengthy (600 words) and detailed. Similarly, sources appearing in low credibility conditions (See Appendix G) were young (approximately 25-30 years of age); usually had a reputation of associating with people of doubtful repute; followed a history of remaining single either through choice or through divorce; placed personal gain and profit over the consideration of other people, were careless, unconscientious, and had been denounced by a person of high authority and credibility within their profession for unethical behavior. Phrases such as "Dr. Lewis's conduct is both detrimental to the profession and unbecoming of a person in the dental profession," were attributed to specific authorities. To avoid biasing the results, none of the adjectives employed in the source semantic differential rating scales were used.

In the high credibility treatment conditions, equally high standards were employed to maintain the plausibility of the biographical sketches. Fictitious sources of high source credibility were usually older (Hovland, 1951) in the age range of 59 to 64, and followed a long and distinguished professional career.

Highly credible sources earned degrees from prestigious universities, held tenured faculty positions, and were members of church, civic, and professional organizations. In addition, these sources presented an image of "leading" people by initiating research and community im-
provement projects, by establishing themselves as one of the leading opinion makers of their profession, and by demonstrating their concern for other people. They were quoted by the journals and periodicals in their respective profession, had received numerous service and academic distinctions, portraying an image of vigor and dynamism. High sources maintained stable home lives, were married, with children in similar professions, and were involved in civic projects.

In both high and low source credibility conditions the biographical sketches were presented as "information." The leading paragraph noted that the message which followed was taken from an address made by the particular source to a specific group. The title of the communicator's address was then quoted, with the concluding remark that the biographical sketch was presented to "help you better understand the speaker's point of view."

Defensive messages. Both the supportive and refutational defenses consisted of reading printed messages of the same length (600) words and style as used by McGuire. Each message was divided into three paragraphs. In the supportive defense, as constructed by McGuire, the first paragraph mentioned that the belief was certainly true, but that to forestall any possible objections "we should familiarize ourselves with the reasons for holding the belief [McGuire, 1961c, p. 186]." Two such supporting arguments
were then presented, and developed in greater detail with purportedly factual material in the following two paragraphs. Each paragraph contained the name of the attributed source in journalistic style, e.g., "Dr. Norman Korn opened his address by observing that..."

In the refutational defense, the first paragraph mentioned that the belief was apparently true, but that occasionally "reports by well-intentioned but misguided persons were heard." For this reason it was suggested that it would be wise to know the fallacies in these erroneous counterarguments, two of which were then mentioned and refuted, but not in any detail. In the paragraphs that followed the two counterattacks were refuted in some detail.

Counterattacking messages. The messages used in the immediate counterattacks, like the defenses, were 600 word messages developed by McGuire. The first paragraph noted that although the belief was still widely accepted, recent breakthroughs were beginning to demonstrate that the belief was fallacious. Two counterarguments against the belief were then mentioned. The two paragraphs that followed developed the counterattacks in detail.

In both the counterattacking message condition and the defensive message condition, several minor alterations were introduced to facilitate the experimental design. In each of the first two paragraphs of the message, the fictitious source's name and title were reinstated to illustrate
that the text was a quote. In addition, the source cue was reinstated as a concluding remark in the third paragraph, e.g., "On the other hand," urged Dr. Holman, "if we faithfully carry out the necessary precaution of getting an annual chest X-ray, we can be sure of quick and successful cure, and prevent TB from ever again becoming the No. 1 killer in the U.S."

**Independent Variables**

**Sources.** Source manipulation took the form of 600 word printed descriptions of the source in each source-message combination. The biographical sketch preceded the message attributed to the source.

The sources were described in test booklets under conditions of high or low\(^3\) communicator credibility attributed to refutational-same defense messages; refutational attack messages; supportive defense messages, and supportive attack messages.

After reading the biographical information, subjects then read the attributed message, and responded to a scale designed to test their perception of the source on both authoritativeness and character dimensions. A source's credibility rating on each dimension was obtained

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\(^3\)A moderate level of source credibility was also tested, but due to the inability to obtain statistically significant differences between the low and high credibility source, was discarded.
by summing each subject's response on the six scales measuring that dimension.

*Defensive pretreatments.* Subjects were administered 600 word messages in both the refutational-same and the supportive defense conditions, followed by immediately contiguous 600 word counterarguments. In the refutational-same defense condition, subjects read messages mentioning and refuting possible counterattacks. In the supportive defense, only belief bolstering information was supplied. The messages were the same ones employed by McGuire (1961a).

**Dependent Variables**

*Sources.* Six, seven-interval scales (scored from 1 to 7) for each of the two dimensions (authoritativeness and character) were used to test the success of the credibility manipulation. The scales used to assess authoritativeness of the source were reliable-unreliable; informed-uninformed; qualified-unqualified; intelligent-unintelligent; valuable-worthless; and expert-inexpert. The scales: honest-dishonest; friendly-unfriendly; pleasant-unpleasant; unselfish-selfish; nice-awful; and virtuous-sinful were used to measure the character of the source. Mean credibility ratings were obtained across each dimension with a score less than 24 indicating a favorable source, and a score greater than 24 indicating an unfavorable source.
Resistance to persuasion. Resistance to persuasion occurred when a defense-attack experimental treatment produced a mean belief level significantly higher than its corresponding attack-only treatment (McGuire, 1961a).

Results

Data Analysis

Results were tabulated using an analysis of variance program (ANOVRA) developed by Games, Gray, Daubert, Herron and Pitz, in conjunction with an analysis of variance computer program developed by Nie (1969) to accommodate the missing cell configuration of the present design. Three separate analyses were conducted, with the .05 level of statistical probability established as the criterion significance value. When significant interactions were obtained, one-tailed $t$ tests were employed to facilitate interpretation of the directional hypotheses formulated.

Adequacy of the Experimental Conditions

Post-experimental questionnaire results. The experiment was represented as a reading comprehension test designed to measure comprehension skills. To test the effectiveness of the subterfuge, subjects were asked to indicate what they believed the specific intent of the examination to be. Out of 288 students polled in the mixed treatment groups, 63 subjects gave responses indicating that they might have
perceived the experiment to involve persuasion or attitude change. A separate analysis of variance on the data from these 63 subjects provided no significant difference from those obtained from the remaining 225 subjects.

Response to the final reminder not to discuss the test with those students who had not yet taken the exam, revealed an acceptable rate of compliance. Only 14 students indicated that they had any advanced knowledge of the test, and this knowledge was mainly confined to the length of the test and procedure for ensuring credit for participation. The subjects also indicated that the time allocated for the test was satisfactory. One subject stated that she had previously been exposed to the persuasive messages in a similar experiment, therefore, her data were not computed.

Measurement of opinion items. Two control conditions set the determinates within which the immunization effects would be measured. The control data (Tables 3 and 4)

4Of the total 63 subjects who gave responses indicating possible discernment of the experiment's intent, 58 were confined to one Speech 100 class. In this particular instance, the test was administered to an intact class of approximately 80 students, and specifics of the experiment's objective were inadvertently announced by the instructor immediately preceding administration of the test. The subjects served in mixed treatment groups, however, so that any bias introduced was randomly distributed across all treatment and control groups. A separate analysis of variance on the data of the subjects indicating discernment of the experiment's intent, and those indicating no discernment, revealed no significant difference.
Table 3
Mean Belief Levels Produced by Source Manipulations

<table>
<thead>
<tr>
<th>Source Condition</th>
<th>N</th>
<th>Source Dimensions</th>
<th>Initial Mean Attitude</th>
<th>Mean Postmessage Attitude</th>
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<td></td>
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<tr>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Refutational-Same Defense Conditions</td>
<td></td>
<td>Character</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Defense</td>
<td>12</td>
<td>10.16&lt;sup&gt;b&lt;/sup&gt;</td>
<td>17.83</td>
<td>46.16 (11.54)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Low Defense</td>
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<td>22.94</td>
<td>27.08</td>
<td>46.16 (11.54)</td>
</tr>
<tr>
<td>High Attack</td>
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<td>13.55</td>
<td>19.13</td>
<td>46.16 (11.54)</td>
</tr>
<tr>
<td>Low Attack</td>
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<td>24.55</td>
<td>28.86</td>
<td>46.16 (11.54)</td>
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<tr>
<td>Supportive Defense Conditions</td>
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</tr>
<tr>
<td>High Defense</td>
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<td>8.11</td>
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<td>42.58 (10.65)</td>
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<tr>
<td>Low Defense</td>
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<td>27.41</td>
<td>42.58 (10.65)</td>
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<tr>
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<td>10.33</td>
<td>17.16</td>
<td>42.58 (10.65)</td>
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<tr>
<td>Low Attack</td>
<td>12</td>
<td>20.13</td>
<td>26.16</td>
<td>42.58 (10.65)</td>
</tr>
</tbody>
</table>

Note.--Numbers in parentheses represent calculated means based on summed response. Complete adherence to the belief equals 15.00.
<sup>a</sup>Control group mean levels.
<sup>b</sup>The lower the source dimension score, the greater the source in credibility.
# Table 4

Mean Belief Levels Produced by All Source-Message Combinations

<table>
<thead>
<tr>
<th>Issues</th>
<th>Source-Message Combinations</th>
<th>Control Group No Immunization</th>
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<tbody>
<tr>
<td></td>
<td>HCD-LCA</td>
<td>HCD-HCA</td>
</tr>
<tr>
<td>Chest X-rays</td>
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</tr>
<tr>
<td></td>
<td>34.91a (8.73)</td>
<td>33.08 (8.27)</td>
</tr>
<tr>
<td>Total N:</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Refutational-Same Defense Conditions</td>
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</tr>
<tr>
<td>Tooth Brushing</td>
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</tr>
<tr>
<td></td>
<td>42.58 (10.65)b</td>
<td>37.66 (9.42)</td>
</tr>
<tr>
<td>Total N:</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Note.—N=12 for all treatment group cells.

a Means based on four responses on a 15-point scale with a score of 60 representing complete adherence to the belief.

b Numbers in parentheses represent computed means based on the summed response. Complete adherence equals 15.00.
indicate that the initial beliefs on the two issues were quite extreme. The initial mean belief level in the neither-attack-nor defense condition was 11.09 on the 15-point scale across the two critical issues. Submeans for the toothbrushing and chest X-ray were, respectively, 11.54 and 10.65. Subjects pre-message attitudes toward the two critical issues were tested using a t test. This analysis yielded a nonsignificant t value of 1.02 (d.f. = 36). Thus, all subjects could be assumed to be similar in their attitudes toward the topic prior to message reception.

Adequacy of the source manipulation. Due to the complex design of the present study, it was necessary to construct credible and noncredible sources who could plausibly be attributed to either a defensive or counterattacking message strategy. Thus, the experimental treatment groups required the manipulation of four sources in each defense condition. In the refutational-same defense condition, fictitious sources were constructed to fill the following conditions: a high credibility defense (HCD); a high credibility attack (HCA); a low credibility defense (LCD); and a low credibility attack (LCA). The same source conditions were required in the supportive defense as well, with all of the possible combinations of the above source conditions being manipulated to induce maximum resistance.

It was generally felt that since both the credible and noncredible sources would be manipulated experimentally
under the conditions described, the source perception would be more refined and more accurate if the same sources were rated without the message under the same conditions. In other words, each source in the pre-message condition was rated by the subjects according to their perception of the source in a defending or attacking situation under both supportive and refutational-same defense conditions. This was accomplished by linking the source with the issue, e.g., "The address was one of a series made by Dr. Wright entitled, 'Some Dangers of Excessive Tooth Brushing,' in which he attacked the widely accepted health practice."
The subjects were then provided with 600-word biographical statements and asked to rate the source on the dimensions of authoritativeness and character (See Appendix C). The procedure developed for the pre-message rating of sources is in accord with the work of Walster, Aronson, and Abrahams (1966) which showed that a low credibility communicator is enhanced when arguing against his own best interest. It is generally held that sources are viewed according to the message side advocated in a particular persuasive context.

From this foundation, guidelines were established which required that a statistically significant difference (p<.05) be found between the low and high credibility source in each condition, i.e., a high credibility refutational defense versus a low credibility refutational de-
fense, etc. This was necessary to determine if two levels of credibility could be achieved before attributing the persuasive messages to the sources.

The source control conditions were administered in randomly assigned mixed groups within the population at large, yielding a statistically significant difference ($p<.005$) between the low and high credibility source on both dimensions in each source condition.

The computed mean for the high credibility sources under defensive conditions (supportive and refutational) of authoritativeness was 1.52 based on a 7-point scale, with "1" assigned the highest level of credibility. The scores reported in Table 5 represent the summed score across each of the six dimensions, so that the "averaged" score is obtained by dividing the summed scores by six to obtain the proportional scale value.

The average character score for the combined high credibility defensive conditions was 2.76, computed from the summed scores of 17.83 and 15.38, respectively. Likewise, the high credibility sources yielded an average authoritative score of 1.99 (supportive=10.33, refutational=13.55) when assigned the position of attacking the issue. The average character score for the combined high credibility sources under "attacking" conditions was 3.02.

The low credibility sources assigned to defensive message topics yielded an average of 3.80 on the authori-
Table 5
Source Credibility Means for Source Treatment and Source Control Groups

<table>
<thead>
<tr>
<th>Source Credibility Dimensions</th>
<th>Source Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Message Conditions</td>
</tr>
<tr>
<td></td>
<td>HCD</td>
</tr>
<tr>
<td>Authoritativeness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>***8.11&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td>Character</td>
<td>15.38&lt;sub&gt;c&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

| Authoritativeness              |     |     |     |     |     |     |     |     |
|                               | 10.16<sub>i</sub> | ***22.94<sub>i</sub> | 13.55<sub>j</sub> | 24.55<sub>j</sub> | 9.25<sub>m</sub> | 28.08<sub>m</sub> | 11.08<sub>n</sub> | 26.08<sub>n</sub> |
| Character                      | 17.83<sub>k</sub> | *27.08<sub>k</sub> | 19.13<sub>l</sub> | 28.86<sub>l</sub> | 19.41<sub>o</sub> | 29.66<sub>o</sub> | 18.91<sub>p</sub> | 28.66<sub>p</sub> |

Note.--N=36 in all cases. Means are based on six factors of each dimension (See Table 1) ranging from a mean of six (highest credibility) to a mean of 42 (lowest credibility). Scale neutral point equals 24. Same-lettered means differ significantly (p<.005).

*<sub>p</sub><.05  
**<sub>p</sub><.01  
***<sub>p</sub><.005
tativeness dimension (22.94 plus 22.75) and 4.54 on the character dimension (27.08 plus 27.41). Noncredible sources attributed to messages attacking the issue received average source ratings of 3.72 (24.55 plus 20.13) and 4.58 (28.86 plus 26.16) respectively, on the authoritativeness and character dimensions. These scores and their implications are discussed in detail in the "Discussion" section.

The results of the source manipulation, reported in Table 5, also reveal that while there was a statistical inclination for the sources to gain on both dimensions when associated with the actual message \( (p<.001, \text{Tables 6 and 7}) \), the sources were still significantly different \( (p<.005) \) from each other. Significant levels of difference were found between the high and low credibility sources on both dimensions in all conditions, both with and without message attribution.

**Effectiveness of source manipulation on belief level.** The highly credible source boosted the initial mean belief level in both the refutational-same and supportive defenses, although the source boost failed to approach traditional levels of statistical significance. While the critical \( t \) value of 1.71 was not achieved \( (d.f.=24, \ t=1.25) \) in the supportive defense, the source boost does represent a 23 percent gain over the remaining scale values. The highly credible source's belief level (defense-only) of 11.63,
Table 6

Analysis of Variance of Authoritativeness and Character Dimensions of Source Credibility in Defensive Message Strategies

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>MS</th>
<th>F-ratio</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authoritativeness</td>
<td>7</td>
<td>2652.276</td>
<td>72.793</td>
<td>0.001</td>
</tr>
<tr>
<td>Character</td>
<td>7</td>
<td>1467.105</td>
<td>45.427</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Note.--One-way analysis of eight conditions.
*Comparison of both dimensions in supportive and refutational message treatment groups with supportive and refutational no-message groups.
Table 7

Analysis of Variance of Authoritativeness and Character Dimensions of Source Credibility in Counterargument Message Strategies

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>MS</th>
<th>F-ratio</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authoritativenessa</td>
<td>3</td>
<td>3040.661</td>
<td>61.837</td>
<td>0.001</td>
</tr>
<tr>
<td>Character</td>
<td>3</td>
<td>1714.831</td>
<td>62.747</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Note.--One-way analysis of four conditions.
aComparison of both dimensions in supportive and refutational message treatment groups with supportive and refutational no-message groups.
when compared with the initial mean belief level of 10.65, suggests the superiority of the supportive defense in direct strengthening ability. In the refutational-same defense, the highly credible source belief level of 11.85 represents a nonsignificant gain of nine percent over the remaining scale values.

Meanwhile, the low credibility sources failed to boost the initial mean belief levels, but they did act to maintain the belief levels. This finding is in accord with the findings of Greenberg and Miller (1966) that early attribution of a low credibility source may either inhibit attitude change or cause the auditor to revert back to the original belief level. No significant differences were found between the low defense-only belief level and the control belief level in either of the defense conditions. In fact, in the supportive defense condition, the low credibility source maintained the belief level at exactly \( t = 0.000 \) the same level as that produced in the initial mean belief level.

Similarly, both the low and high credibility sources (attack-only) reduced the belief significantly when not preceded by a pretreatment defense \( (p < .005) \), but failed to confer statistically different amounts of belief reduction. The mean belief levels of 7.35 and 5.94 for the low and high sources, while in the predicted direction, do not differ significantly.
To reiterate, although a clear numerical distinction was found between both the high and low credibility sources, both with and without message attribution, the statistically significant difference failed to emerge when comparing the effects of the source manipulation on the resulting supportive belief levels. While the belief levels in the supportive condition are clearly in the right direction for the single treatment groups, statistical significance was not achieved. See Table 3.

In the refutational-same defense the two levels of source credibility differed significantly in producing differential belief levels under both attack-only and defense-only message conditions. The high attack-only and low attack-only treatment groups yielded belief levels at 5.08 and 7.23 respectively, a statistical difference at the .05 level of probability (d.f.=24, t=1.77). Likewise, the high defense-only belief level compared with that of the low defense-only belief level was significant at the .05 level (d.f.=24, t=1.89). The data reported in Table 3 show that the source manipulation had a significant effect on the resulting belief levels in the refutational-same defense condition, but not in the supportive defense condition. This discrepancy may be partially resolved by observing that all four of the sources in the supportive condition tended to be slightly more credible in the authoritativeness and character dimensions than were the
refutational-same sources. The overall increase, although slight, may have had the effect of neutralizing any differential belief level effects. As indicated, however all the results were in the expected direction.

**Effects of message attribution on source credibility perception.** Separate analyses of variance on the source credibility dimensions from pre- to post-message evaluation, indicate a statistically significant difference \( (p=.001) \) in the source perception. Significant shifts occurred between those auditors who rated the sources without the persuasive message, and those auditors who evaluated the sources with their respective messages. The data, previously reported in Tables 5, 6, and 7 demonstrate that the high credibility source recorded a substantial gain in perceived authoritativeness when defending the chest X-ray health practice. The average source with-message authoritativeness level of 1.35 (based on the summed score of 8.11) represents a statistically significant gain \( (p=.005) \) from the source no-message level of 1.93 (summed score=11.58). Similarly, the low credibility source improved significantly on both dimensions of credibility when associated with a message attacking the health truism. These significant gains may have had the effect of cancelling out the differential belief level changes, which would normally be expected to result of the source manipulation.

In the refutational-same defense, the two levels of
low source credibility (attack and defense) yielded significant gains in both authoritativeness and character when associated with the persuasive messages. When attributed to the pretreatment defense, the combined source with-message authoritativeness level for the low source was 3.82 (based on the summed response of 22.94), which represents a gain at the .005 level of probability over the same condition without message attribution.

The overall trend established in the present study is for the low credibility sources to gain in credibility under either "defending" or "attacking" message conditions. The high credibility sources, meanwhile, tend to lose significantly when attacking the issue, and gain significantly when defending the issue.

Relative superiority of refutational-same defenses over supportive defenses in conferring resistance. Hypothesis 1 was confirmed. As can be seen in Figures 2 through 11, the refutational-same defenses were clearly superior in conferring resistance to the subsequent counterarguments. In fact, in only one source-message combination (high defense vs. high attack) did the supportive defense give any indication of establishing resistance, and this did not approach acceptable levels of significance. See Figures 5 and 10.

In the low-defense versus low-attack treatment neither defense conferred any appreciable amount of immunization, as predicted. Figures 2 and 7 indicate that the
Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations

Low-Defense versus Low-Attack

*Means those followed by the same letter with connecting lines do not differ significantly from one another ($p < .05$).
FIGURE 3

Comparison of Mean Belief Levels for Refutational-Same Source Message Combinations

Low-Defense versus High-Attack

*Means those followed by the same letter do not differ significantly from one another (p<.05).

**Means those followed by different letters differ significantly from one another (p<.005).
Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations

High-Defense versus Low-Attack

*Means those followed by the same letter do not differ significantly from one another ($p<.05$).

**Means those followed by different letters differ significantly from one another ($p<.025$).
FIGURE 5

Comparison of Mean Belief Levels for Refutational-Same Source-Message Combinations

High-Defense versus High-Attack

*Means those followed by the same letter do not differ significantly from one another (p<.05).

**Means those followed by different letters differ significantly from one another (p<.005).
Comparison of Mean Belief Levels for Refutational-Same Source Message Combinations

High-Defense versus Low-Defense and High-Attack versus Low-Attack

*Means those followed by different letters differ significantly from one another (p<.05).
FIGURE 7

Comparison of Mean Belief Levels for Supportive Source-Message Combinations

Low-Defense versus Low Attack

*Means those followed by the same letter do not differ significantly from one another (p<.05).
FIGURE 8

Comparison of Mean Belief Levels for Supportive Source-Message Combinations

Low-Defense versus High-Attack

*Means those followed by the same letter do not differ significantly from one another ($p < .05$).
FIGURE 9

Comparison of Mean Belief Levels for Supportive Source-Message Combinations

High-Defense versus Low-Attack

*Means those followed by the same letter do not differ significantly from one another (p<.05).
Comparison of Mean Belief Levels for Supportive Source-Message Combinations

High-Defense versus High-Attack

*Means those followed by the same letter do not differ significantly from one another ($p<.05$).

Note.--High-Defense versus High-Attack treatment compared with High-Attack only treatment produces a $t$ value of 1.61 ($0.05<p<0.10$).
Comparison of Mean Belief Levels for Supportive Source-Message Combinations

High-Defense versus Low-Defense and High-Attack versus Low-Attack

*Means those followed by the same letter with connecting lines do not differ significantly from one another (p < .05).
mean belief level produced by this source combination was exactly the same for both of the defenses, although two entirely different mechanisms are posited for this effect. A comparison of the two conditions and the hypothesized mechanisms are described in the "Discussion" section which follows.

Similarly, the supportive condition gives no indication of conferring resistance in the low defense versus high attack treatment condition. This contrasts conspicuously with the immunizing efficacy of the low source in the refutational-same defense. When not preceded by a pre-treatment low-defense, the belief level was reduced to 5.94, a reduction of 4.71 points from the control level of 10.65. When preceded by the low defense pretreatment, the belief was actually reduced 0.19 points more than when not preceded by the defense. (See Figure 8). The belief level drop of 5.94 to 5.75 represents an effectiveness level beyond 100 percent for the attack in reducing the belief level when preceded by the low source defense. The implications of this finding are discussed in greater detail later.

In the high defense versus low attack immunizing treatment, the high defense actually strengthened the belief level by 23 percent, but failed to confer a significant amount of resistance even when the subsequent attack was attributed to a low source. See Figure 9, Tables 3 and
4. The attack-only belief level of 7.35 is only slightly lower than the 8.73 mean belief level of the immunizing condition. This difference does not represent a statistically significant difference, thus the pretreatment defense condition was not successful in immunizing against the subsequent low attack. The shifts in credibility are reported in Figures 12 and 13.

Relative efficacy of the low-credibility source in immunizing against a refutational-same counterargument emanating from a high credibility source. That a low source can be effective in inoculating against a counterattack by a high source when the attack consists of those points specifically refuted, was confirmed. While the low defense was effective by itself in maintaining the belief (10.54), it was far from completely effective in maintaining the belief against a strong attack attributed to a high credibility source. Nevertheless, prior immunization by the low credibility source left the belief 3.36 points higher ($p < .005$) than the 5.08 point level to which it was reduced when the strong counterargument presented by the high source had not been preceded by prior defense.

One can obtain some feeling for the degree of resistance actually conferred by the low credibility communicator when evaluating the resistance in proportional terms. For instance, the high attack-only (Figure 3, Table 3) reduced the belief to 5.08 from the initial mean belief level
Mean Comparisons for Refutational Pre-Message and Post-Message Authoritative Levels

Note.—Broken line refers to post-message authoritativness level. Straight line refers to pre-message control level.

aThe lower the number the more authoritative the source.

bRefers to source categories: high credibility defense; low credibility defense; high credibility attack, and low credibility attack.
FIGURE 13

Mean Comparisons for Supportive Pre-Message and Post-Message Authoritative Levels

Note.—Broken line refers to pre-message control level. Straight line refers to post-message authoritative level.

aThe lower the number the more authoritative the source.

bRefers to source categories: high credibility defense; low credibility defense; high credibility attack, and low credibility attack.
of 11.54 when not preceded by a pretreatment defense. This represents a drop of 6.46 scale points. When the high source attack was preceded by a low source defense, the belief level dropped only 3.10 points. This represents a 52 percent reduction in the effectiveness of the high source attack. The data clearly establishes the effectiveness of the low credibility communicator as an effective immunizer against high source attacks under those conditions tested in the present study.

Low credibility refutational-same defense versus low credibility refutational counterattack. The inability of the low credibility source to induce psychological resistance against counterarguments attributed to equally low credibility sources was substantiated. Although this prediction was based on health truisms using counterarguments which attacked those points previously refuted, a more general application of this source-message treatment combination would probably prove valid.

As previously noted, although the low credibility source (defense-only) does not substantially boost the belief level, no significant difference was found between the low and the initial mean belief (d.f. = 24, t = 0.956). Hence, it can be assumed that the low credibility source attribution does maintain the belief level.

Figure 2 demonstrates the inability of the low source defense to withstand a low source attack. Propor-
tionally, the low attack-only reduced the belief level to 7.23 from the initial belief level of 11.54 when not preceded by the pretreatment. This represents a belief reduction of 4.31 points. Similarly, when the low source attack was preceded by the low source defense (8.27), a belief drop of 3.27 points was registered. The difference between these two belief reductions is not significant. The low attack-only source reduced the belief level to within 25 percent of the low attack-only belief level. Another way of stating this is that the low attack was 75 percent effective against a low defense. The hypothesis is further substantiated through $t$ test calculations on the respective belief scores. This analysis yielded a nonsignificant $t$ value of $0.851, d.f.=24$, indicating the superiority of the low source attack. The effectiveness of the source and message manipulations are shown in Table 8.

Superiority of the high credibility source in conferring resistance to subsequent counterarguments attributed to high and low credibility sources. The data reported in Figure 5 indicate that the high credibility defense, while far from completely effective, did confer a significant amount of resistance against a subsequent high credibility attack. The high attack (Figure 5) reduced the belief to 5.08 from the initial mean of 11.54 when not preceded by a defensive pretreatment. This drop of 6.46 scale points, compared with the 2.12 point drop of the immunization treatment represents a 66
### Table 8
Analysis of Variance for Experimental Groups

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F-ratio</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defenses (A)</td>
<td>357.789</td>
<td>1</td>
<td>357.789</td>
<td>4.230</td>
<td>0.025</td>
</tr>
<tr>
<td>Source Credibility (B)</td>
<td>13095.176</td>
<td>8</td>
<td>1636.897</td>
<td>13.288</td>
<td>0.001</td>
</tr>
<tr>
<td>A X B</td>
<td>968.940</td>
<td>8</td>
<td>121.118</td>
<td>0.983</td>
<td>0.450</td>
</tr>
<tr>
<td>Error</td>
<td>24391.332</td>
<td>198</td>
<td>123.189</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
percent reduction in the effectiveness of the high attack. Analysis of the belief scores using a simple $t$ test yielded a statistically significant difference between the immunization treatment and the corresponding attack-only treatment at the .005 level of probability ($d.f.=24, t=5.661$).

Prior immunization, although not totally effective, left the beliefs from approximately 3.00 to 5.00 points higher than the level attained when the counterarguments had not been preceded by a defense. In the high defense versus low attack immunization treatment, however, maximum resistance did occur. The low attack failed to reduce the belief level substantially from the initial mean belief level ($d.f.=24, t=0.728$) in the immunization treatment.

The immunization treatment belief level of 10.65 represents a nonsignificant ($d.f.=24, t=0.728$) drop of .89 points from the initial mean belief of 11.54. When the message was not preceded by the pretreatment defense, the low attack-only reduced the belief to 7.23. (See Figure 4, Tables 3 and 4). This represents a drop of 4.31 points from the initial mean belief level. Computation of the two belief drops, indicates an 80 percent reduction in the effectiveness of the low source attack. Although the high credibility communicator did not boost the belief level significantly from the initial mean belief level (11.85 compared to 11.54), it was highly effective in maintaining the belief against a low source attack. Thus, hypothesis 4
was confirmed under conditions of both low and high source attack, although it is immediately apparent that greater resistance was produced when the attacking message was attributed to a low credibility communicator.

Discussion

In 1973, Gerald R. Miller and Michael Burgoon authored a book which reviewed some of the current findings in persuasion. Titled New Techniques of Persuasion, the authors concluded the chapter on "Inducing Resistance to Persuasion" by observing that:

Kelman and Hovland's (1953) finding that source and assertion are disassociated over time, thus minimizing the source's importance leads us to conclude that researchers would be wise to give up on Tannenbaum's search for the proper source-assertion combinations and to concentrate on refining the refutational and supportive message strategies...Although much effort has been expended to specify the effects of source-assertion interactions, the characteristics of the message appear to be much more important than source characteristics in conferring resistance [pp. 41-42].

Although the findings of the present study indicate that there is certainly some validity to the authors' assertion, these authors fail to recognize the value of positive and negative sources in either accentuating or attenuating auditor attention upon the contents of the particular message strategy. As noted in the introductory literature, sources per se are obviously unable to contribute any additional motivating material, however, this does not negate
their impact in the immunization process. On the contrary, the main effect of the source variable is its potential impact on the message itself. Sources are known to act as "evaluative sets," enhancing or inhibiting learning, attention, retention, and attitude change. For example, it can be argued that a low credibility source provokes less threat than one from a high credibility source, and therefore less motivation exists for the auditor to utilize the material presented.

It is also interesting to note that the authors' observation was based solely on the experimentation of Tannenbaum, since no other experimenter until present has attempted to manipulate the source variable within the resistance paradigm.

Similarly, the distinguished authors overlook those communication situations in which the source and his communication are so intimately associated that one spontaneously recalls the source when he thinks about the particular issue. It is equally probable that recall of a particular issue when intimately associated with a salient source evokes cognitive evaluation of other sources who have addressed the same issue, either pro or con. This is the hypothesized mechanism for the predictions presented in all four of the hypotheses. The present study addressed this rather general hypothesis by maintaining the source cue throughout, and by assuming that the communication process
in the present setting, indeed, in most natural settings, is one far broader than an auditor evaluating a source, evaluating the source's message, and evaluating the source with the message. The underlying assumption of the present study is that in a persuasive context, sources are evaluated not only individually and with their respective messages, but with other sources and their messages. This cognitive process may be generally taken for granted, but seldom does one find it propounded in the literature. With this principle in mind, the results of the experimental manipulations are discussed.

The findings of the present study suggest utility of both practical and theoretical import. In addition, it represents a needed extension of the work accomplished by Brooks (1970), Brooks and Scheidel (1968), Greenberg and Miller (1966), and Ward and McGinnies (1974) with respect to source perception and evaluation.

The data from the present study suggests that the source variable can alter the assimilation of the intrinsic motivating and threatening components of a particular message strategy under high and low source credibility conditions. The data also suggests that the psychological demand for spontaneous recall of the defensive material imposed by a second, subsequent source attacking the same specific points previously refuted, may profoundly alter traditional immunization predictions. The effect of these
predictions and their implications are discussed below.

Hypothesized mechanisms for source-assertion immunizing effects. Hypothesis 2 predicted that a low credibility source (refutational-same) would be significantly effective in immunizing against a high credibility attack. As reported in the "Results" section, this hypothesis was substantiated. The "confirmation hypothesis" is in line with the observations made by Schulmann and Worrall (1968) that the "majority of persons in the low credibility condition immediately after exposure spontaneously thought of both the source and the communication [p. 380]." This mechanism considered alone would explain the "inhibiting effect" described by Ward and McGinnies (1974) and the "forewarning effect" described by Greenberg and Miller (1966). In contrast, however, the high credibility source elicits a tendency after exposure for the auditors to think spontaneously not about the source, but only about the communication content. When the two sources are juxtaposed in a communication setting such as that found in the typical inoculation paradigm under refutational-same defense conditions, a quasi-source reversal is produced through message confirmation and recall. This is accomplished through the psychological demand placed on the auditor to recall the earlier presented defensive material, when the second presentation is attributed to a highly credible source who attacks the same points previously refuted by a non-credi-
ble source. The data from the present study indicates that the demand for recall is present only when a more threatening, highly credible source is attributed to the attacking message. For example, given a high credibility refutational attack, the auditor concentrates on the communication content. The communication content in this situation, is the same content previously refuted by the low credibility source in the pretreatment defense. Such a process it is reasoned, would automatically make the low credibility source and attributed message spontaneously recalled. Recall of the defensive material, although probably limited, would provide a degree of immunization to the subsequent high source attack while confirming the low credibility source's reliability. That is, the same specific points which the low credibility source outlined as points of opposition were developed in detail as counterarguments by the high source. The totality of this cognitive reaction, is to inoculate the auditor through the process of recall and association.

Another mechanism whereby the source reversal could have occurred springs from the basic cognition offered by Koeske and Crano (1968). According to these authors, source reversal may be a matter of auditor logic and deduction, "that the existing evidence must have been irrefutable to convince an 'incongruous' low credibility source [p. 397]."
Brooks (1970) suggests the possibility of contrast effects operating in particular communication settings to produce the source reversal:

This principle assumes that we carry stereotypes into such social settings as the public speech. There, the speaker's behavior may be discrepant with our stereotyped expectations. If the discrepant stimuli cannot be assimilated or ignored, they are likely to be exaggerated in the listener's perception [p. 155].

Brooks further posits that the speaker's persuasiveness may have little to do with this effect, but rather the message may contrast with stereotyped expectations. In the present study this mechanism, like those previously mentioned, could easily account for the effect. The messages constructed by McGuire were literate and well organized, and would probably contrast markedly with auditor expectations of a low credibility communicator.

Under differing source-assertion combinations, however, it is apparent that different mechanisms are set into motion which create or destroy the necessary conditions under which immunization may occur. Although these mechanisms may be attributed largely to the motivating components of the refutational-same defense, it seems obvious that the present findings are due to an interaction of source and message mechanisms. For instance, hypothesis 2 predicted no immunization under conditions of a low credibility counterattack. In fact, the prediction was that the low credibility source in the subsequent attack would reduce
the belief significantly.

One possible explanation for the lack of immunizing efficacy, and the success of the low credibility attack, may again be attributed to the psychological demands imposed by the source. For instance, although the points attacked by the low credibility source are the same points refuted by the low credibility source in the defense, no demand exists to recall the defensive material due to the negative characteristics of the attacking source. See Figure 4. As previously noted, attribution of a low credibility source to a persuasive message causes the auditor to focus on both the content and the source. In the absence of a subsequent counterattack by a high credibility source to confirm the low credibility source's message, the source-assertions are not spontaneously associated, and in fact may be completely dissociated. Without the psychological demand imposed by a source of high credibility to provoke recall of the defensive material, no immunization could be expected. Therefore, when the low credibility pretreatment defense is followed immediately by a low credibility counterargument, the attack reduces the belief significantly.

In the pretreatment defense, the presence of a low credibility source effectively inhibits total assimilation of the defensive and motivating material, increasing vulnerability to a persuasive attack, even one attributed to
an equally low communicator. Similarly, the fact that the low credibility "attack" source fails to provoke spontaneous recall of the defensive material, results in dissociation of the two source-assertions. This severing process serves to effectively increase the auditor's vulnerability to the subsequent attack.

Another plausible explanation is simply that if an equally low credibility source launched the counterattack, the auditor's evaluation of the attacking source would necessitate reevaluation. This explanation would hold with the findings of Walster, Aronson, and Abrahams (1966) that the "persuasiveness of a low credibility communicator can be enhanced when he argues against his own best interest [pp. 341-342]." Within the present context, the finding would be analogous to the familiar adage that "it takes a thief to catch a thief."

In contrast, hypothesis 4 predicted that a high credibility source attributed to a defense would be effective in immunizing against attacks attributed to both low and high credibility sources. As noted in the "Results" section this hypothesis was confirmed.

The same mechanism responsible for the effect produced in hypothesis 2 and 3 can just as easily account for the above effects. Under conditions of a low source defense, when the subsequent attack is attributed to a high credibility source, spontaneous association and recall of
the defensive source-assertion produces immunization. However, when the subsequent attack is attributed to a low credibility source, no demand is placed on the auditor to recall the defensive information, and the effect is one of dissociation and increased vulnerability.

When the defense is attributed to a high credibility source, however, the effect is slightly different. First, the initial attribution of the high source to the refutational message should serve to enhance or bolster the concept. The positive source should enhance the intrinsically threatening components to a point to withstand the belief reducing impact of even a high credibility source main attack. Although spontaneous association and recall is still predicted under this source-assertion combination (high defense vs. high attack), the high source defense should initially increase defensive assimilation to withstand the belief reducing counterarguments. In fact, the spontaneous association of the two source-assertions in this condition may actually contribute to the immunizing effectiveness. See Figure 5.

When the source-assertions are changed to the configuration seen in Figure 4, the belief level would predictably be higher. Under conditions of a high source defense followed by a low source attack, the belief bolstering effect of the high source is even more apparent. The dissociation bond produced by the low source attack
increases the belief bolstering effectiveness of the high source defense, producing maximum resistance.

This is just the opposite of the effect produced by the low defense versus low attack combination. Without the reinforcing effect produced by the attribution of a high credibility source defense, low source dissociation fosters vulnerability to the non-credible attack. With the high source defense instated, however, the low source dissociation increases the belief maintaining effectiveness of the highly credible defense. In other words, in both the high defense versus low attack (HD-LA) and the low defense versus low attack (LD-LA) treatment conditions, no demand for defensive information recall is required of the auditor. Likewise, spontaneous recall of the earlier source-assertion does not occur. In the latter condition, the absence of this cognitive requirement combined with the "inhibiting effect" produced by the low source defense, increases the receiver's vulnerability to the persuasive counterattack. In the former condition, the lack of spontaneous recall produced by the low credibility attack, combined with the bolstering effect of the highly credible source contrasts markedly. The effect is maximum immunization.

The supportive defense yielded findings identical to those reported in hypothesis 2 under this immunizing treatment (Figure 7), however the reason for this is
slightly different. In the supportive pretreatment condition, no motivation exists within the message for assimilating defensive material. Assigning a low credibility source to the pretreatment defense serves to accentuate the absence of stimulating material and to negate any bolstering effect that might otherwise derive from the defense, thereby increasing the belief's vulnerability to a persuasive counterattack.

Results of the supportive source-message combinations provide additional evidence of the inferiority of this pretreatment defense strategy in immunizing against widely held beliefs. The data clearly indicates that regardless of source attribution, immunization is unrealistic without the intrinsic motivating and threatening components peculiar to the refutational-same strategy. In fact, evidence of the source manipulation is, in some respects, even more apparent with the supportive than the refutational condition.

Figure 8 provides an excellent example of the effects of the source variable on the belief level of those subjects exposed to supportive pretreatment defenses. Although the low defense maintained the belief at exactly the same level as the initial mean belief when not followed by an attack, the low source provided even less motivation to use the belief bolstering material. When followed immediately by a high credibility source attack, the belief
level was reduced beyond the belief level of the attack-only treatment. This can be explained by two reasons. First, in the absence of motivating material, the low source further serves to inhibit assimilation. The presence of the low credibility source inhibits assimilation of belief bolstering material which would normally occur, and the high credibility source attack simply contrasts the apparent vulnerability. Even when the high credibility source is attributed to the pretreatment defense, it cannot by itself exert enough influence to withstand the subsequent attack. Likewise, the general theory of spontaneous recall and association requires that the same elements proposed in the defensive treatment be present in the subsequent counterattack message—an ingredient not found in the supportive defense. In the absence of this essential ingredient, it seems unlikely that the mere attribution of a highly credible source to the defensive message could boost the concept enough to withstand a main attack attributed to either a high or low credibility source.

According to Tannenbaum (1967),

If the initial attitude toward the concept can be boosted and made even more intensely favorable, it should be less susceptible to subsequent persuasion attempts in a negative direction [p. 282].

In Tannenbaum's experiment the supportive messages were identified as coming from a professional committee. They offered supportive evidence for the particular health
practice without any direct reference to the main attack. The mean belief for the concept boost strategy was 10.85, significantly \((p<.05)\) higher than the attack-only mean of 8.39 and quite close to the no-message control group mean of 11.22. In an additional study, a significant \((p<.001)\) strengthening of the concept belief (11.91 to 13.29) was noted.

Although the present study failed to replicate the immunization achieved by Tannenbaum in the supportive defense, the mean belief levels were generally in the right direction. See Figures 9 and 10. In the present study, the high defense-only boosted the mean belief level to 11.63 from the control group level of 10.65. Although this is not a significant boost, it does represent a boost in the right direction. The combined source-assertion treatments (high defense versus high attack, high defense versus low attack, etc.), however, failed to confer any significant amount of resistance. Several reasons exist for the lack of immunizing efficacy in the supportive "concept boost" treatment as opposed to the success of Tannenbaum's manipulations.

First, since Tannenbaum gives no indication of the effectiveness of the source manipulation by way of a credibility score, comparisons are hindered. No dependent measure of the source manipulation was taken. Secondly, Tannenbaum attributed the supportive defense to a "profes-
sional committee" which may have had greater credibility and more authoritativeness than a personal source. In addition, it seems likely that the auditors would experience more difficulty in derogating a "collective" source than a personal source.

Thirdly, no experiment to date has attempted to measure the scale value increases needed to sustain the belief level produced by a supportive defense against a persuasive main attack. Tannenbaum noted that the belief was increased from 11.91 to 13.29 when a favorable (professional committee) source was attributed to the supportive defense. He also reported that this manipulation was sufficient to immunize against the persuasive attack.

In the present study, the belief level was bolstered from 10.65 to 11.63 when a high credibility source was attributed to the message. It seems possible that this (.98 points) increase is not significant enough to induce resistance, and that furthermore, a collective or non-personal entity source such as that employed by Tannenbaum would be more effective than the personal source used in the present study. Finally, Tannenbaum manipulated the attack and defensive message portions separately under varying source combinations, never under combined source-assertion conditions as in the present study. Likewise, Tannenbaum combined the defensive non-personal sources with personal counterattacking sources. In other words, the
"professional committee" was attributed to the supportive defense, while a "Dr. William J. McGuire" was attributed to the supportive counterattack. This comparison seems illogical and impractical. It is doubtful that a single, personal source would have even a slight chance of reducing the belief level produced by a collective, non-personal source. If this is true, as suspected, the immunization reported by Tannenbaum in the supportive defense condition is simply the result of generically incompatible sources. The lack of compatible sources and dependent source measures make comparisons between the Tannenbaum study and the present study difficult, at best.

The findings of the present study, and the inconsistencies noted in previous studies, provides additional evidence for the contention that the source has little influence, except in those cases where the source and message are saliently associated, or where exposure to one source-assertion provides spontaneous recall of a second source-assertion. The present study asserts that the source and message are, in fact, "saliently associated" in the refutational-same defensive strategy, but not in the supportive defense.

In addition, contrary to the opinion of some researchers, the present study suggests that the source variable can be effective in either accentuating or attenuating resistance to a persuasive communication. Since the two
elements required by inoculation theory as necessary for
the induction of immunization—the defensive information
and motivating threat—are present in both the high and low
source conditions, equal degrees of resistance would be
expected to result if the source variable had no effect.
As demonstrated, this was not the case.

Limitations and future directions. In the present study
the source biographies were equal to the persuasive mes­sages in length, and the source cue was maintained through­out the inoculation sequence. In light of the fact that
previous researchers have failed to find significant dif­ferences between the low and high source on at least one
dimension of credibility, e.g., authoritativeness or char­acter, the present study offers a possible explanation.

Indications are that the source introduction must
be lengthy and detailed, although plausible. Since a
number of techniques were used to enhance or derogate the
source to produce the two levels of source credibility, it
is difficult, if not impossible, to isolate those component
parts (e.g., testimony, evidence, etc.) which contributed
to the sum total of perceived credibility or noncredibility.

Several of the generalizations presented in the
present study with regard to auditors' perception of the
source's credibility, and attention to the attributed mes­sage might be entirely different under more "natural" con­ditions. For instance, the sources and messages used in
the present study were manipulated within a written context. As such, it represents a rather artificial environment to judge source-assertion effects. When a source is attended to in person, source demeanor, dress, mannerisms, gestures, and a multitude of subtle verbal and nonverbal cues provide the stimuli for judging source credibility. Likewise, sources of a controversial or celebrity status could be expected to have differential effects on source perception, message assimilation, and attitude change when viewed "in-person" as opposed to the more static world of the written context.

In the present study the auditors' perception of both the credible and noncredible sources was greatly curtailed due to the lack of factor analytic application. Although the sources were assessed within the parameters of "authoritativeness" and "character," such dimensions obviously limit source perception. For instance, it seems immediately apparent that the source cannot be rated on the "objective" (Whitehead, 1968) factor if the factor is not included in the dependent measure. In fact, lack of factor analysis on those dimensions used under the guise of assumed relevancy, may actually induce false assumptions concerning source perception and factor loading. Just as the absence of a factor limits source perception, the mere presence of a factor (e.g., honest-dishonest, etc.) does not automatically ensure that the specific factor contrib-
uted significantly to the perceived credibility or noncredibility unless factor analysis is conducted. A more accurate assessment of source perception could be achieved by using the "marker variables" employed in previous research efforts and factor analyzing them with each source, each concept, and within each context.

As a corollary to this line of reasoning, the data in the present study tends to support the specific source values obtained under credible and noncredible source manipulations by Clark, Stewart, and Marston (1972). These researchers found that the low credibility scores were closer to the neutral point (2.627 to 3.709). They also noted a tendency for the auditors to avoid the less extreme scores. In the present study the high credibility scores ranged from 1.52 to 1.99 on the authoritative dimension, while the low credibility source scores ranged from 3.72 to 3.80. Character scores for the high sources ranged from 2.76 to 3.02, with the low credibility scores between 4.54 and 4.58. The findings tend to bear out the work of Clark, Stewart, and Marston "that extremely low [or high] ratings are unlikely to result, at least when the source is not a real individual known to the respondents [p. 196]." The present study also noted that the "character" scores were consistently higher than the authoritative scores, and tended to hover closer to the neutral point in both the high and low credibility source condition. This is prob-
ably due to the difficulty in rating source character when the source is not known or personally observed. As suggested by Clark, *et al.*, one way of reducing the ambiguity surrounding the properties of the sources would be to perform factor analytic studies in which high and low credibility are factored separately (p. 196).

By way of internal criticism, the possibility that the results were confounded by regression effects does not appear to be valid. The study examined differential belief level changes as a function of source-assertion links under refutational-same and supportive defense conditions. Although regression might in some instances account for the existence of attitudinal shifts, it could not account for the observed differences in attitudinal change. These seem more likely attributable to the variations of source credibility employed.

Likewise, order effects would not present a valid criticism. The source and message combinations were randomly assigned in mixed treatment groups eliminating this alternate explanation.

A number of recent studies, however, have found support for the idea that demand characteristics account for a portion of the change variance in laboratory opinion experiments. Where studies employ high and low source manipulations, it appears that the demand characteristics criticism may be valid to some extent. The demands of the
high source condition are usually apparent even to the most naive subject. The high source is described in glowing terms which connote authoritativeness and trustworthiness, and his message articulates change in a specified direction. Hence, correct perception of the demand characteristics plus the impact of the persuasive communication should combine to produce at least some of the attitude change.

In the low source condition, the demand characteristic conveyed is that change is not desired nor expected. In this case, the subjects would not expect the message to be as persuasive and might attempt not to be influenced.

Since the demand characteristics in the present study, as in most opinion change studies, are confounded, it is difficult to know how much of the change is directly attributable.

The present study used message topics of a nonego-involving nature. Additional research might consider manipulating both message intensity and source credibility with respect to highly salient or ego-involving topics. Studies conducted by Bowers (1963), Burgoon (1972), and Hovland and Pritzker (1957) suggest that message intensity, due to the contrasting effect (Brooks, 1970), may be a major determinant of attitude change. McEwen and Greenberg (1970) concluded that the most effective persuasive strategy is to ensure that the intensity of a persuasive message and the intensity of attitudes about a source are
isomorphic.

For instance, with ego-involving topics it might be expected that a low intensity message emanating from highly credible sources would be more effective in producing attitude change among receivers initially opposed to the proposition. Similarly, supportive defenses of a controversial nature might be expected to be highly effective in immunizing against a belief reducing counterargument when both the source and message intensity are high.

Additional research should also attempt to determine the point in the communication transaction in which the source either gains or loses in credibility. Likewise, no studies to date have addressed the specific levels of credibility that are required for minimal persuasive success. The question which should be asked then is, "What is the level of source credibility to which an initially favorable source can be reduced, and still accomplish persuasion. Finally, research efforts in this area should be directed toward determining which factors (e.g., honest-dishonest, moral-immoral, etc.) are essential for a source to possess and still remain effective.

Summary

Previous studies have questioned the importance of the source variable in conferring resistance to persuasive communications. Except for the work of Tannenbaum, however,
no systematic exploration of the effects of the source variable in the immunization process have been undertaken.

A series of experiments conducted by McGuire (1961) revealed that the refutational-same defense was superior to the supportive defense in immunizing efficacy. The refutational-same defense, which mentions and specifically refutes the same arguments which are used in the subsequent counterattack, confers resistance by providing both motivation and material. The supportive defense, however, provides only belief bolstering material by mentioning only those reasons or arguments that specifically support the issue.

In contrast, sources do not contribute any belief stimulating material or motivation, but may bolster or inhibit the assimilation of such material. Sources act as evaluative sets, providing the receiver with mediating cues for acceptance or rejection. Low credibility sources inhibit attitude change, while focusing the auditor's attention on both the source and the communication content. High credibility sources act as belief bolstering cues by focusing the auditor's attention on the communication content.

The present study tested four hypotheses designed to demonstrate the importance of the source variable in conferring resistance when the sources are varied under all combinations of defense and counterattack message strategy.
The first hypothesis predicted that the refutational-same defense would be superior in conferring resistance over that of the supportive defense. This prediction was based on the lack of motivating material in the supportive condition.

The remainder of the hypotheses predicted the immunizing efficacy of the refutational-same defense under all possible combinations of source attribution. The underlying assumption for the hypotheses was based on the general hypothesis that sources are evaluated not only individually and with their respective messages, but with other sources and their respective messages. It was also held that the message structure of the refutational-same defense would make spontaneous recall of specifically valenced sources automatic under certain conditions.

Hypothesis 2 predicted that the low credibility communicator would be significantly effective in conferring resistance against a high credibility counterattack. This was based on the theoretical assumption that the psychological demand to recall the low credibility communicator's message imposed by the high credibility source, would produce some degree of immunization.

The third hypothesis predicted that the low credibility counterattack would be significantly effective in reducing resistance, when the pretreatment defense was attributed to an equally low source communicator. It was
predicted that the low credibility pretreatment defense would not provide enough motivation for assimilation of the defensive material, thereby increasing the belief's vulnerability. The prediction was also based on the theoretical assumption that the juxtaposition of two low credibility sources would result in dissociation. Due to the limited belief bolstering effect of the low source defense and lack of spontaneous recall demand imposed by a low source attack, the attack was expected to effectively reduce the immunizing efficacy of the low defense.

The final hypothesis predicted that a pretreatment defense assigned to a high credibility source would be effective in inoculating against either a high or low source counterattack. Under this condition it was argued that the auditor's attention would focus on the communication content, increasing assimilation of the defensive material. This mechanism, combined with the degree of spontaneous recall imposed by the attack source was hypothesized to explain the immunizing efficacy.

A total of 307 college students participated in 12 experimental conditions during the Spring quarter of 1974. The 2 X 2 X 2 factorial analysis of variance design represented all possible combinations of the defense (Refutational-same and supportive) times the attack source (high and low), times the defense source (high and low). Subjects were given 14-page booklets which attributed both
high and low credibility sources to three experimental treatment conditions. Sources biographies were composed on both credible and noncredible sources, and immediately preceded the message strategies.

The source cue was maintained immediately preceding the message in the form of the source biography, at three critical points in the message, and immediately prior to source evaluation. After reading the source biographies and the persuasive messages, which was represented as a reading comprehension test, subjects were asked to complete opinionnaires which measured source perception and belief level. Source perception was measured using McCroskey's (1966) dimensions of authoritativeness and character.

The results indicated that the source manipulation was successful. The low and high sources differed significantly from each other on both dimensions of credibility at the .005 level of probability. In addition, a statistically significant difference \( (p=.001) \) was found between sources evaluated without the message and those evaluated with the message. Low credibility sources tended to gain in credibility when either attacking or defending, while high credibility sources gained significantly when defending, but lost slightly when attacking an issue.

All four hypotheses were confirmed at the .05 level of probability or better. The results were discussed with respect to statistical regression, order effects, and de-
Conclusions

A number of tentative conclusions may be derived from the present experimental study with regards to the effects of high and low credibility sources in immunizing against belief reducing counterarguments. It should be noted, however, that while the conclusions listed below may have more widespread application, they were derived from the manipulation of sources within a written context, using refutational-same and supportive defenses, and are necessarily confined to this scope for the present.

1) Low credibility sources tend to gain significantly in perceived credibility when associated with messages which either defend or attack the issue.

2) High credibility sources tend to gain significantly in perceived credibility when associated with messages which defend the issue, but tend to lose in perceived credibility slightly when associated with a message that attacks the issue.

3) When associated with a counterattacking message strategy that attacks those points previously refuted, high credibility sources tend to heighten spontaneous recall of the defensive material. Low sources attributed to a refutational-same counterargument tend to impede recall, resulting in message dissociation.
4) When attributed to the pre-treatment defensive message strategy, high credibility sources tend to bolster the concept and increase assimilation of the defensive material. Low credibility sources, however, tend to maintain the belief level without any significant bolstering. The hypothesized mechanism for the low credibility source effect rests with auditor perceptions that "the information to follow may be unreliable." Therefore, there is a tendency for the auditor to discount the message, reverting back to the pre-message level.

5) There is some indication that the source variable in general may have little influence, except in those cases where the source and message are saliently associated, or where exposure to one source-assertion provides spontaneous recall of a second source-assertion.

6) It is hypothesized that the structure of the refutational-same message, by specifically mentioning and refuting those points which are subsequently attacked, contributes to spontaneous recall and association. As such, this may be one more mechanism in addition to the "threatening and motivating" mechanism proposed by McGuire, and the "assertion weakening" mechanism postulated by Tannenbaum, wherein resistance to persuasion is induced.

7. Finally, the present study contradicts the opinions of some researchers by demonstrating that the source variable can significantly affect traditional
immunization predictions.
Appendix A

General Instructions
INSTRUCTIONS: This is a timed reading comprehension test designed to test your ability to critically analyze and comprehend what you read. Please begin immediately after reading the instructions and continue until the exercise is complete. Since portions of the test are specifically designed to measure comprehension and retention, please do not turn back to a section once you have completed it.

Please read each page carefully, underlining directly in the test booklet those passages, phrases, or words that seem most important to you.

After you have completed all of the required reading, please answer the questions that appear at the end. Try to answer the questions completely and honestly, based only on your personal feelings, regardless of whether your opinion happens to coincide with the statements or not. You do not need to sign your name, but to assist us in analyzing the data please PRINT your age, sex, and class standing (freshman, sophomore, junior or senior) directly at the top of this page. You may now begin.
Appendix B

Source Instructions
Instruction Sheet

This portion of the reading comprehension examination is primarily concerned with the source of a given communication. Some researchers now feel that the way we perceive a source as a communicator of information may affect the results of reading comprehension tests.

On the page that follows are listed a number of adjectives from one through seven, which are frequently used to assess speakers. Once again, there are no right or wrong answers. Please rate the communicator of the message which you have just read on the basis of your personal feelings and impressions. Work quickly, since only two minutes are allowed for this portion of the test. Be sure to note that in all cases, four (4) represents the neutral point on the scale.

(Please continue)
Appendix C

Source Rating Scale
Source Rating Scale

**SOURCE:** Dr. Jason Lewis

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliable</td>
<td>1/2/3/4/5/6/7</td>
<td>Unreliable</td>
</tr>
<tr>
<td>Informed</td>
<td>1/2/3/4/5/6/7</td>
<td>Uninformed</td>
</tr>
<tr>
<td>Qualified</td>
<td>1/2/3/4/5/6/7</td>
<td>Unqualified</td>
</tr>
<tr>
<td>Intelligent</td>
<td>1/2/3/4/5/6/7</td>
<td>Unintelligent</td>
</tr>
<tr>
<td>Valuable</td>
<td>1/2/3/4/5/6/7</td>
<td>Worthless</td>
</tr>
<tr>
<td>Expert</td>
<td>1/2/3/4/5/6/7</td>
<td>Inexpert</td>
</tr>
<tr>
<td>Honest</td>
<td>1/2/3/4/5/6/7</td>
<td>Dishonest</td>
</tr>
<tr>
<td>Friendly</td>
<td>1/2/3/4/5/6/7</td>
<td>Unfriendly</td>
</tr>
<tr>
<td>Pleasant</td>
<td>1/2/3/4/5/6/7</td>
<td>Unpleasant</td>
</tr>
<tr>
<td>Unselfish</td>
<td>1/2/3/4/5/6/7</td>
<td>Selfish</td>
</tr>
<tr>
<td>Nice</td>
<td>1/2/3/4/5/6/7</td>
<td>Awful</td>
</tr>
<tr>
<td>Virtuous</td>
<td>1/2/3/4/5/6/7</td>
<td>Sinful</td>
</tr>
</tbody>
</table>

(Continue to the next page)
Instructions: The following true and false statements are related to the paragraphs which you have just read. Do not turn back to find the correct answer. In some instances, there is no correct answer, and you should place a "U" in the space immediately to the left. Please mark your answer sheet "T" (True), "F" (False), or "U" (Uncertain).

1. ____ Most of us brush our teeth more or less automatically.

2. ____ It has been suggested that excessive tooth brushing may result in cancer of the gums.

3. ____ The enamel of the teeth may be damaged severely by excessive tooth brushing.

4. ____ The chest X-ray is the only sure way of detecting tuberculosis.

5. ____ Brushing the teeth after every meal will virtually eliminate tooth decay.

6. ____ More doctors recommend "Crest" toothpaste than any other brand.

7. ____ X-ray radiation is particularly damaging to the reproductive tissue, and that is the only reason why chest X-rays should be avoided.

8. ____ Chest X-rays for the detection of tuberculosis are recommended on an annual basis.

9. ____ Bleeding of the gums indicates weakness of the gums caused by lack of stimulation.

10. ____ Overexposure to chest X-rays may result in sterility.
Appendix E

Opinion Questionnaire
Opinion Questionnaire

The following two pages contain the 17-item opinion questionnaire used in: McGuire, William J. "Persistence of the Resistance to Persuasion Induced by Various Types of Prior Belief Defenses."

Beliefs on each of the four truisms were measured by four items as follows:

a) Chest X-ray truism: items 1, 6, 10, 15.

b) Merits of penicillin truism: items 2, 7, 11, 16.

c) Frequent tooth brushing truism: items 3, 5, 13, 14.

d) Routine annual checkup truism: items 4, 9, 12, 18.

Five of the items are "reversed" as they appear on the questionnaire, i.e., the left end was given a value of "15" and the right "1" in assessing adherence to the truism. All other items received a "1" value on the left and a "15" on the right.

The repeated items used for the reliability check appear as items 6 and 16. Items 8 and 19 were added to accommodate the "filler" essays.
Opinion Survey

As was indicated earlier, we are interested in determining the extent to which the reading comprehension score obtained in this test is affected by the person's feelings about the topics discussed. Hence, we are here asking you to indicate your personal feelings about the truth of the statements listed below by circling the one number that best indicates your judgment of the truth of that statement. Notice that the larger the number, the more true the statement is judged; the smaller the number the more false it is judged.

Please respond to each of the 17 statements on this and the following pages by indicating your own personal opinion of the statement's truth, regardless of whether your opinion agrees or disagrees with some or all of the material read in this test. Answer the questions in the order presented, and do not skip any question. Work rapidly, as only three minutes are allowed for answering all 17 questions.

1. Everyone should get a chest X-ray each year in order to detect any possible TB (tuberculosis) symptoms at an early stage.

   /1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/  
   Definitely/Probably/Uncertain/Probably/Definitely/False/False/Uncertain/Probably/Definitely/True/True

2. The effects of penicillin have been, almost without exception, of great benefit to mankind.

   /1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/  
   Definitely/Probably/Uncertain/Probably/Definitely/False/False/Uncertain/Probably/Definitely/True/True

3. Everyone should brush his teeth after every meal if at all possible.

   /1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/  
   Definitely/Probably/Uncertain/Probably/Definitely/False/False/Uncertain/Probably/Definitely/True/True

4. Everyone should see his doctor at least once a year.

   /1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/  
   Definitely/Probably/Uncertain/Probably/Definitely/False/False/Uncertain/Probably/Definitely/True/True
5. Brushing one's teeth can become a harmful practice, if one does it too often.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True

6. Chest X-ray examinations for TB should be taken regularly and often.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True

7. The benefits to mankind from using penicillin have far outweighed any disadvantages.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True

8. Automobile exhaust is the major source of air pollution in the United States today.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True

9. If everyone were to get a complete physical checkup once every year more harm than good would result.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True

10. Even though one may not have any reason for suspecting TB, it is a good idea to have frequent chest X-ray examinations.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True

11. Probably the greatest single advance in the history of medical science was the discovery of penicillin.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True

12. People should not be urged to have a complete medical checkup so often as once a year.

/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/
/Definitely/ Probably / Uncertain/ Probably / Definitely /
False False True True
13. The best way to prevent tooth decay is to brush one's teeth frequently.

\[
\begin{array}{ccccccccc}
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15
\end{array}
\]

Definitely/ Probably/ Uncertain/ Probably/ Definitely/ True/ True

14. There are disadvantages to brushing one's teeth too often, as well as too seldom.

\[
\begin{array}{ccccccccc}
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15
\end{array}
\]

Definitely/ Probably/ Uncertain/ Probably/ Definitely/ True/ True

15. All things considered, getting an annual chest X-ray for detecting TB is a very wise practice.

\[
\begin{array}{ccccccccc}
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15
\end{array}
\]

Definitely/ Probably/ Uncertain/ Probably/ Definitely/ True/ True

16. It is rather foolish to call penicillin a "wonder drug" when there are so many disadvantages to its use.

\[
\begin{array}{ccccccccc}
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15
\end{array}
\]

Definitely/ Probably/ Uncertain/ Probably/ Definitely/ True/ True

17. Chest X-ray examinations for TB should be taken regularly and often.

\[
\begin{array}{ccccccccc}
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15
\end{array}
\]

Definitely/ Probably/ Uncertain/ Probably/ Definitely/ True/ True

18. We should all have medical checkups, not only when we feel ill, but also at frequent intervals even when we feel well.

\[
\begin{array}{ccccccccc}
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15
\end{array}
\]

Definitely/ Probably/ Uncertain/ Probably/ Definitely/ True/ True

19. Most air pollution can be attributed to industrial waste and byproducts.

\[
\begin{array}{ccccccccc}
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15
\end{array}
\]

Definitely/ Probably/ Uncertain/ Probably/ Definitely/ True/ True
Appendix F

Critique Sheet
Critique Sheet

Instructions: Please respond to the questions below in your own words.

1. Did you have enough time to adequately complete the test?

2. Were you told about any portion of the test by other members of your class or other students? If so, what?

3. Have you ever taken a test similar to this one in the past? If so, please describe briefly.

4. What do you believe the purpose of the test to be? Describe in detail.

Reminder: To maintain the integrity of the examination, please do not discuss it with those who have not yet taken it. Thank you.
Appendix G

Source Biographies
Source Biographies

The following 16 pages contain the source biographies used in the experiment. Four low credibility sources and four high credibility sources were constructed to accommodate the defending and attacking messages. Each source biography consists of approximately 600 words, being equal in length to the message strategies employed by McGuire.

The source biographies are coded below, and are matched with the same code letters of the corresponding message type:

a) LSA: Low Supportive Attack
b) LSD: Low Supportive Defense
c) LRA: Low Refutational Attack
d) LRD: Low Refutational Defense
e) HSA: High Supportive Attack
f) HSD: High Supportive Defense
g) HRA: High Refutational Attack
h) HRD: High Refutational Defense
For your information. The piece you are about to read was taken from an address made by Theodore D. Woolsey, M.D. Dr. Woolsey, presently under investigation by the American Medical Association, has been charged with "criminal negligence" in the case of one former patient who died from an over-exposure of X-ray radiation. The address entitled, "Some Harmful Effects of Chest X-rays," was one of several delivered to civic organizations in Richmond, Virginia, prior to the above incident. Before you read the address, however, and to help you better understand the speaker's point of view, we have provided you with some of the pertinent facts about his training and personal history.

Theodore Woolsey, 37, received his undergraduate training at the University of Denver in 1960. After several years of "hitch-hiking" he decided on medicine as a career and was admitted to the West Virginia University College of Medicine. He was known by fellow students as a "loner, but an average student." Dr. John Harnish, now practicing in Rochester, New York, roomed with Woolsey while at WVU, and recalls that "he was moody, sometimes melancholy and depressed, and violently furious when disagreed with." According to Harnish, Dr. Woolsey was constantly in trouble with his professors, and was accused on two separate occasions of plagiarism.

After graduation, Dr. Woolsey moved to Richmond, Virginia, to obtain post-graduate training in respiratory illnesses and radiology. Woolsey established a fairly lucrative practice and soon became involved in local politics. In 1970 he ran for the county commissioner post and was elected by a landslide vote, but later resigned under accusations that he had bribed an elections official to fix the vote. No charges were filed against Dr. Woolsey.

In early 1971, Dr. Woolsey was hospitalized in the St. Theresa Hospital for a condition vaguely described as "mild depression." It was later learned that Dr. Woolsey had gone into a rage, cursing one of his patients who refused to hold still while being X-rayed. Dr. Robert Lattner, Director of Mental Health at St. Theresa, stated that Woolsey had been under "tremendous pressure and simply needed some rest." Lattner indicated that Dr. Woolsey seemed to be a very tense person, a condition for which he had been taking medication for nearly five years. Lattner refused to comment on the specific diagnosis of Woolsey's illness.

Due to Dr. Woolsey's mental and physical condition,
the American Medical Association recommended that he be re-examined by a board of specialists before resuming private practice. At the time of the AMA's recommendation, legal action was also pending, stemming from charges brought by Mr. and Mrs. Dale Wottling. The Wottling's alleged that Woolsey was directly responsible for the death of Mr. Wottling's father, John Edward, Sr., who died of radiation exposure after being treated over a period of two years by Woolsey. The Richmond county coroner's autopsy report confirmed that the elder Wottling did, in fact, die from X-ray overexposure. Final action in the case is still pending at this time.

Dr. Woolsey, still recuperating, now resides alone in Samdstone, Virginia, where he spends most of his time gardening and building model airplanes.

The full text of his speech follows.
LSD

For your information. The piece you are about to read was taken from an address made by James Holman, M.D. He is presently under investigation by the American Medical Association for "unethical and unprofessional behavior." The address was one of a series entitled, "The Importance of an Annual X-ray Exam for Detecting Tuberculosis," presented to civic organizations with the explicit disapproval of the AMA. Before you read the address, however, and to assist you in understanding the speaker's point of view, we have provided you with some of the pertinent facts about his life history.

Dr. James Holman, 33, graduated from the Curtis Institute of Medicine, a small and recently established medical school in Philadelphia. Having decided on radiology as his field of specialty, Dr. Holman returned to his home town of Atlanta to receive post-graduate training and to begin establishing a private practice. In 1971 he was offered an adjunct faculty position with the University of Alabama Medical College, which he readily accepted due to the unprosperous nature of his business. Unable to secure bank loans for the purpose of building an office, Holman was forced to open for practice, using his two-bedroom home as office and clinic. Dr. Holman, a bachelor, soon found himself in numerous legal suits. A total of 11 "character" and "malpractice" suits were filed against Holman during the first nine months of his practice.

During the time that Holman was facing the legal suits, the University of Alabama discovered that he had been using departmental funds to finance personal "pleasure" trips to Mexico and the Bahamas. The funds which Dr. Holman was accused of taking were earmarked for a special "children's respiratory illness and disease clinic." Due to the seriousness of the allegations and legal suits, the American Medical Association launched an intensive background investigation of Dr. Holman and of the charges brought against him. In June of 1972, upon the recommendation of the AMA, Dr. Holman was suspended. In barring Dr. Holman from practicing medicine, the Professional Standards Committee observed, "...that Dr. Holman's conduct is both detrimental to the profession and unbecoming of a person in the medical profession." The committee report noted that "while in private practice, Dr. Holman required many of his female patients to disrobe on the pretense that 'wearing apparel often interferes with the X-ray negative.'" Dr. Holman indicated to his female patients, according to the AMA transcripts, that most physicians preferred to take X-rays with the patient undressed, but were reluctant to
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require it. He explained to the patients that the pro-
cedure was initiated simply to provide the patient with
total care.

On the basis of "immoral and unethical conduct,"
Dr. Holman was disbarred from ever practicing medicine in
the United States again. Prior to the investigation, Dr.
Holman had been warned repeatedly for making "unjustified
statements to public and private organizations." The
American Tuberculosis Association publicly censured Dr.
Holman in the Atlanta Constitution for "...distributing infor-
mation on the nature of respiratory illnesses and the use
of X-rays in detecting tuberculosis which lacked scientific
evidence or support..." In fact, one of the charges that
resulted in Dr. Holman's suspension was that "he made per-
sonal appearances and guest lectures for the sole purpose
of soliciting business." Dr. Holman now resides with his
mother and sister in Decatur.

The full text of his address follows.
For your information. The following piece which you are about to read was taken from a speech made by Dr. Jason Lewis, 29, a disbarred member of the American Dental Association. The address was one of a series entitled, "Some Dangers of Excessive Tooth Brushing," presented to civic and parent organizations with the explicit disapproval of the American Dental Association. Before you read the address, however, and to help you better understand the speaker's point of view, we have provided you with some of the pertinent facts about his life history.

Dr. Lewis, 33, graduated from the Curtis Institute of Dentistry, a small and recently established dental school in Philadelphia. Having decided on a general practice in dentistry, Dr. Lewis returned to his home town of Atlanta to establish a practice. In 1971 he was offered an adjunct faculty position with the University of Alabama's Dental College, an offer which he readily accepted due to the unprosperous nature of his business. Unable to secure bank loans, Dr. Lewis converted one of the rooms in his two bedroom home into a small clinic. Dr. Lewis, a bachelor, soon found himself faced with numerous legal suits. A total of nine character and malpractice suits were filed against Lewis alleging immoral behavior, unprofessional conduct, and damages.

During the interim that Lewis was under attack, other troubles plagued the young dentist. The University of Alabama discovered that Lewis had been using departmental funds to finance personal trips to Mexico and to the Bahamas. In a letter of "dismissal," the departmental chairman accused Lewis of deliberately misappropriating and frauding the University to obtain financing of illegal activities. The funds which Lewis had been accused of "misappropriating" were originally earmarked for a special "children's dental care and oral hygiene clinic." Subsequent legal action initiated by the University revealed that Lewis had used the funds to finance a "gambling and prostitution operation." No other details were available. Due to the seriousness of the allegations, however, the American Dental Association launched an intensive background investigation of Dr. Lewis.

In June of 1972, upon the recommendation of the ADA, Dr. Lewis was suspended from practicing the science of dentistry in the United States. In barring Dr. Lewis, the Professional Standards Committee observed, "that Dr. Lewis's conduct is both detrimental to the profession and unbecoming of a person in the dental profession." The
committee recommended his dismissal due to "immoral conduct and questionable professional ethics..."

Prior to the investigation by the ADA, Dr. Lewis had been warned repeatedly by the Association for making "unjust and fallacious statements to the public with regards to the fees charged by men in the profession." The Association also alleged that Lewis had "made personal appearances and guest lectures for the sole purpose of soliciting business...and that much of the advice offered patients with regards to oral hygiene practices was not founded on scientific evidence to the contrary..."

The full text of Dr. Lewis's address follows.
For your information. The following piece which you are about to read was taken from a speech made by Dr. Norman Korn, 29, a disbarred member of the American Dental Association. The address was one of a series entitled, "Some False Charges Against Tooth Brushing Practices," presented to women's organizations throughout the southeastern United States. The series of lectures was made by Dr. Korn with the public disapproval of the American Dental Association on the grounds that "such statements are unjustified, lacking scientific support or evidence..." Before you read the address, however, and to help you better understand the speaker's point of view, we have provided you with some of the pertinent facts about his life history.

Dr. Korn, a 1970 graduate of the University of Minnesota School of Dentistry, was licensed to practice in Minneapolis in September of 1971. His academic records indicate that he was only a marginal student and that due to a technicality in testing procedure on his senior final, was allowed, after appealing the decision, to re-examine on a test that he had failed. During his first six months of general practice in Minneapolis, 14 malpractice suits were filed against Dr. Korn by patients alleging "deliberate extraction of healthy teeth for the sole purpose of personal gain and profit." Several of his patients alleged that Dr. Korn also prescribed "radical oral surgery for minor gum infections," and that he "failed to comply with minimal clinical sanitation standards, thereby contributing to the infection of patients' gums and teeth."

A subsequent investigation by the Professional Standards Committee of the American Dental Association recommended that Dr. Korn be "disbarred from the Association due to unethical and unprofessional behavior." He was also censured by the ADA and by colleagues for making "unjustified statements to the public which were both malicious and fallacious in content."

Due to charges stemming from legal suits against Dr. Korn, the Minneapolis county prosecutor initiated an in-depth investigation against him. Evidence obtained during the investigation and subsequently presented to a jury by the prosecutor charged Dr. Korn with "criminal negligence" in the case of an elderly patient who died during oral surgery.

Dr. Korn later admitted under oath that "due to the financial strain of paying back loans accrued while attending dental school, he was under pressure to make money as
fast as possible." He further stated that his carelessness, although not intentional, was prompted by the combination of financial and marital strain. At the time of the court action, Dr. Korn was separated from his wife of two years, Patricia, who claimed that she had undergone "extreme cruelty, both mental and physical." Korn is presently serving a three year probation as a result of the criminal negligence conviction, and has been permanently barred from practicing the science of dentistry anywhere in the continental United States.

The full text of his address follows.
For your information. The piece you are about to read was taken from an address made by Paul Craddock, M.D., Director of Medicine at a leading university. The address was one of a series entitled, "Some Harmful Effects of Chest X-rays," delivered at a meeting of the American Medical Association. Before you read the address, however, and to help you better understand the speaker's point of view, we have provided you with some of the pertinent facts about his background.

Paul Craddock is director of the National Center for Health Statistics, Health Services and Respiratory Diseases, Department of Health, Education and Welfare (HEW). He received the M.D. with highest honors from Yale University, and obtained post-graduate education in respiratory illnesses and radiology at Johns Hopkins School of Hygiene and Public Health. In addition to his directorship responsibilities, Craddock was recently appointed consulting director of the Yale Medical Research Institute.

Before assuming his present position with Yale University, Dr. Craddock was active in private practice in San Francisco, where he still makes his home. He has held faculty-research positions with the Stanford Medical Research Center and at Queens College, New York. The 1973-74 editor of the American Medical Association Medical Review, Dr. Craddock was a family physician and confidant to the late President Eisenhower. The recognition that Craddock received during his years of service with Eisenhower assisted tremendously in his proposal for a "Medicare" program for the elderly. The Medicare program, long since approved, owes its existence almost entirely to Dr. Craddock's prestigious influence.

Dr. Craddock's reputation as a researcher, physician, consultant, and administrator is unquestionable. In 1962, President John F. Kennedy, in recognition of Craddock's distinguished service proclaimed that "Americans everywhere stand to benefit from the devotion and dedication of men like Dr. Craddock." In presenting Craddock with the HEW Superior Service Award, President Kennedy praised his courage, spirit, and dream for a better and healthier America.

The distinguished scientist, now 67, has placed his estate in trust to provide scholarships for other men and women who aspire to medical careers. Although Craddock states that he is sincerely looking forward to retirement, his contributions to the field of radiology and radio-
biology have far from ceased. He is presently the chairman of a research group sponsored by the Ford Foundation, organized to investigate the causal links of children's respiratory diseases.

Craddock, who makes his home in San Francisco, has long been a vocal advocate of free medical aid. During the past decade, Craddock assisted in introducing over 12 legislative bills to provide a wider range of out-patient medical services for the aged and indigent. When not busy in Washington or at Yale University, Craddock takes his expertise to area high schools as guest lecturer and adviser. Dr. Craddock is married to the former Donna Lynn Hightower of Chicago, Illinois.

The full text of his speech follows.
For your information. The piece you are about to read was taken from an address made by Robert Van Hoeke, M.D., Professor of Medicine. The address was one of a series entitled, "The Importance of an Annual X-ray Exam for Detecting Tuberculosis," presented to civic and parent organizations throughout the southeastern United States. Before you read the address, however, and to help you better understand the speaker's point of view, we have provided you with some of the pertinent facts about his life history.

Dr. Van Hoek earned his M.D. degree from Columbia University and received post-graduate training in radiology and radiobiology from Reed College. In addition to a small, but prosperous private practice maintained in Los Angeles, Hoek is also the acting director of the National Center for Health Services Research and Development. As a past president of the American Medical Association, Dr. Van Hoek now serves as a consultant to numerous federal and state agencies, including the Mental Health Administration and the Department of Health, Education and Welfare.

As a tenured faculty member at the Stanford Medical Research Center, Dr. Van Hoek has provided many contributions to the field of radiology. He has authored five textbooks on respiratory illnesses and radiobiology, in addition to being a frequent contributor to the Medical Record News. During the last year he has been on sabbatical leave from the Stanford Research Center, visiting other medical and research facilities as a guest lecturer and visiting instructor. The lecture tour, which was funded in part by the Department of Health, Education, and Welfare, provided Dr. Van Hoek the opportunity to share his knowledge of tuberculosis and respiratory disease diagnoses with fellow researchers, and interested citizens as well.

Dr. Van Hoek, 64, has a depth of experience not equalled by many medical doctors in any field. His experience includes serving at several governmental posts, authoring and co-editing numerous articles and medical publications, in addition to active practice in his specialty. His career as a researcher and professor of medicine has been equally distinguished. In 1970, Dr. Van Hoek received national recognition in the Scientific American for his efforts towards developing a better, safer, and more reliable technique for X-raying broken bones. During that same year Van Hoek was awarded the American Tuberculosis Association's "Outstanding Teacher and Researcher Award." Other awards include the PHS Distinguished Service and Meritorious Service Awards.
Although Dr. Van Hoek laughingly threatens retirement next year, it seems highly unlikely that the affable and energetic professor of medicine will ever really retire. Always dedicated to meeting the needs of his fellow men, Dr. Van Hoek was responsible for dispatching the first mobile chest X-ray units in the United States. Upon retirement he plans to open a "respiratory clinic" in Los Angeles with a staff of three interns free of charge to patients. As he put it in a recent interview, "God has been very good to me. I have received more than my share of opportunity during this lifetime. The least I can do is demonstrate my gratitude through a few more years of service." A deeply religious man, Dr. Van Hoek makes his home in Los Angeles, California, with his wife Gloria. He has two sons, James and Sonny, both of whom are presently attending medical school at John Hopkins.

The full text of Dr. Van Hoek's speech follows.
For your information. The following piece which you are about to read was taken from a speech made by Dr. Steven A. Wright, 59, Associate Professor of Dentistry and American Dental Association member. The address was one of a series entitled, "Some Dangers of Excessive Tooth Brushing," presented to fellow members of the Minneapolis Dental Association. Before you read the address, however, and to help you better understand the speaker's point of view, we have provided you with some of the pertinent facts with regards to his background, accomplishments, and life history.

Dr. Wright, a licensed dentist in Minneapolis, is the 1973-74 president of the Minneapolis Dental Association. A Phi Beta Kappa graduate of the University of Minnesota and a member of Psi Omega, Dr. Wright has been a faculty member and consultant to the University of Minnesota School of Dentistry for the past eight years. Dr. Wright has served in many capacities in the Minnesota District Dental Association, Minnesota Dental Association, and is the current editor of the American Dental Association (ADA) News Report. Other accomplishments include membership on the board of the American College of Dentists, and past president of the American Association for Advancement of Science. Dr. Wright has written over 35 articles and critical essays over the past eight years, many of which have appeared in the Journal of the American Dental Hygienists' Association and the Journal of Periodontology.

Dr. Wright, a 1946 graduate of the University of Minnesota School of Dentistry, has been at that institution as a professor and researcher since 1965 when he was named associate professor and acting chairman of the department of operative dentistry. Previously, he was in private practice in Memphis, served on the faculty at the University of Tennessee, and was dental education adviser to the El Salvador dental school for the U. S. State Department's foreign aid program. He also was acting dental dean at West Virginia University in 1960. He holds honorary doctorate degrees from the Massachusetts Institute of Technology and from the University of Leipzig, Germany, for "outstanding contributions to the field of preventive dentistry and operative dentistry." The American Dental Association awarded him a certificate of achievement in 1967 as the nation's "Outstanding Researcher of the Year."

Although Dr. Wright candidly admits that his primary devotion is toward furthering our knowledge of preventive dentistry through research, he is equally valued for
his work in related areas. He is technical consultant to
the U.S. National Committee on hospital data and has served
in a consulting capacity to the National Center for Health
Statistics for nearly 20 years. A past national chairman
of the American Cancer Society, Dr. Wright devotes annually
two months of his clinic time treating those patients in
remote areas of his region who are unable to afford or seek
proper dental care. He is one of the sponsors of Federal
Bill #1237-G which proposes "guaranteed dental care to the
sick, indigent, and elderly." He resides in Minneapolis
with his wife, Geneva, two dogs, and three children.

The full text of Dr. Wright's speech follows.
For your information. The piece you are about to read was taken from an address made by Dr. Phillip R. Barron, 64, Professor of Dentistry and American Dental Association member. The address was one of a series entitled, Some False Charges Against Tooth Brushing Practices." presented to civic and parent organizations throughout the southeastern United States. Before you read the address, however, and to help you better understand the speaker's point of view, we have provided you with some of the pertinent facts about his life history.

Dr. Barron, a licensed general practitioner in Richmond, is the 1973-74 president of the Virginia Dental Association, and is a tenured faculty member at the University of Maryland School of Dentistry. A graduate of the University of Maryland School of Dentistry himself, Dr. Barron is also the past president of the American Society of Dentistry, and the Southeastern Society of Pedodontics. His professional affiliations include the American Academy of Pedodontics, a professional branch of dentistry that deals with the care and treatment of children's teeth; Virginia Association of Professional Men and Women; International College of Dentists, McKee Dental Study Club; and Omicron Kappa Upsilon. Locally, he is active in the Rotary Club, the Civic Committee for Community Improvement, and is currently serving a four year nomination as vice chairman of the Richmond Better Business Bureau.

Before accepting his present position with the University of Maryland, Dr. Barron served as the assistant dean of admissions and student affairs at the Medical University of South Carolina College for over 12 years. During that time, the now distinguished Dr. Barron contributed substantially to our present understanding of oral hygiene and preventive dentistry. The author of over 20 textbooks dealing with oral hygiene, Dr. Barron served as a consultant to the Department of Health, Education, and Welfare under the Kennedy Administration in helping to establish "storefront" clinics for the dental needs of the poor and indigent. In 1966, Dr. Barron was recognized by the American Dental Association as "one of the nation's foremost scholars in preventive dentistry." Commenting on his scholastic and research achievements in 1968, Newsweek magazine reported that, "Dr. Barron's contributions in the field of dentistry will not be fully recognized until a generation of dental school graduates have come and gone."

At 64, Dr. Barron is still active both in the community and in the academic environment. Citing his un-
selfish interest in helping people, *The Reader's Digest* described him in 1970 as their "Most Unforgettable Character--devoted, concerned, kind, and refreshingly dedicated to the welfare of others." In addition to his committee work, which Dr. Barron lists as one of his hobbies, other interests include sponsoring Explorer Scout Activities, sailing and skiing. Dr. Barron and his wife, Ruth, have three adopted children, Fumio, 13, Rhonda Jean, 11, and Rodrigues Salvador, 9.

The full text of Dr. Barron's address follows.
Appendix H

Supportive and Refutational-Same Defenses
Some False Charges Against Tooth Brushing Practices

Dr. Phillip R. Barron opened his address to the gathering of civic organizations by observing that "we are all aware that one should brush his teeth after every meal. Yet, from time to time, stories by well-intentioned but misguided reporters are published claiming that this healthful practice is unwise. Often these stories seem, on hasty examination, to be reasonable, but a closer look shows us that they are based on distortions of the facts and are misleading. While no one would claim that brushing one's teeth after every meal will positively prevent tooth decay, it is easy to demonstrate by scientific facts and figures that this practice does reduce the amount of decay and that the practice is in general a very important health measure. Because brushing one's teeth after every meal is so important, and because these distorted arguments against the practice may sometimes sound convincing on the basis of a brief reading, it will be useful to review here some of these misleading arguments against frequent tooth brushing and to show where their errors lie.

Dr. Barron, the past president of the American Society of Dentistry continued his address by noting that "one of these misleading arguments is based on the erroneous claim that brushing the teeth tends to cause gum injuries and pushes the gums back, exposing the more vulnerable part of the teeth to decay. As a matter of fact, brushing the teeth causes less damage to the gums than does eating itself. It would be ridiculous to suggest that we should give up eating as that we should give up brushing our teeth because of the trivial amount of gum damage involved. In fact, in the long run, frequent brushing improves the health of the gums as well as that of the teeth. For example, bleeding of the gums is most commonly observed when the person brushes his teeth after a long period of neglect. Bleeding indicates weakness of the gums from lack of such stimulation as proper brushing gives them. It has been found in experiments that bleeding gums are less common in persons who brush after every meal than in those who fail to do so. The gums are among the strongest tissues of the body. The stimulating gum-message involved in vigorous brushing after each meal has been shown to strengthen these gum tissues rather than weaken them.

"Another misleading argument against tooth brushing is that tooth pastes contain harsh abrasives which pit the

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enamel of the teeth, leaving them open to bacterial damage. Such tooth pastes did indeed exist fifty years ago in this country, and are still used in some parts of the world, but all tooth pastes now sold in this country are free from such defect. Since the advent of the Pure Food and Drug Act all tooth pastes, before they are made available to the public, must be thoroughly tested and all abrasives (plus any other questionable contents) must be eliminated before the dentifrice is put on the market. By the time a tooth paste reaches the public in this country it has been thoroughly analyzed and tested and has been approved by both the United States Public Health Service and the American Dental Association as perfectly harmless for the public to use. In conclusion, Dr. Barron observed that, "it is important that such misleading arguments as those which we saw here do not cause us to neglect this simple and highly effective health practice of brushing our teeth after every meal."

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Korn continued his address by noting that "one of the misleading arguments is based on the erroneous claim that brushing the teeth tends to cause gum injuries and pushes the gums back, exposing the more vulnerable part of the teeth to decay. As a matter of fact, brushing the teeth causes less damage to the gums than does eating itself. It would be as ridiculous to suggest that we should give up eating as that we should give up brushing our teeth because of the trivial amount of gum damage involved. In fact, in the long run, frequent brushing improves the health of the gums as well as that of the teeth. For example, bleeding of the gums is most commonly observed when the person brushes his teeth after a long period of neglect. Bleeding indicates weakness of the gums from lack of such stimulation as proper brushing gives them. It has been found in experiments that bleeding gums are less common in persons who brush after every meal than in those who fail to do so. The gums are among the strongest tissues of the body. The stimulating gum-massage involved in vigorous brushing after each meal has been shown to strengthen these gum tissues rather than weaken them.

"Another misleading argument against tooth brushing is that tooth pastes contain harsh abrasives which pit the enamel of the teeth, leaving them open to bacterial damage."
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The Importance of an Annual X-Ray Exam for Detecting TB

Dr. Robert Van Hoek opened his address to the group of civic and parent clubs by observing that "great progress through medical research has been made in the past fifty years in the fight to control, detect, and cure TB (tuberculosis). At the turn of the century this disease was the nation's No. 1 killer. In the past few decades, however, TB has been reduced to a minor and well-controlled health problem. The most important single weapon that has made this historic advance possible has been the widespread adoption by the American people of the practice of getting annual chest X-ray examinations, which remains the best way of detecting TB symptoms in their earliest stages. In order to maintain the gains which have been made, the public's continued cooperation in this X-ray campaign is essential. The chest X-ray is the surest way of detecting TB symptoms, thus providing maximum protection from this highly contagious disease, not only for the patient himself but also to his loved ones and others with whom he comes in contact. Furthermore, the annual chest X-ray examination gives assurance that TB will be detected in its earliest stages when the cure is easy, painless, and complete. Let us explore more thoroughly the reasons which make the annual chest X-ray so important for the detection of TB symptoms.

Van Hoek continued his address by noting that "the chest X-ray is extremely important because it is the only sure way of detecting TB. This disease can seldom be recognized by outward symptoms. People who have TB and have not had chest X-rays, very rarely know it until it is far advanced, because the first outward symptoms are so slight that they are usually either ignored entirely or mistaken for a common cold. However, through the miracle of X-rays, we can get a picture of the patient's lungs that will clearly show any signs of TB. With other methods, TB symptoms may go unnoticed, but when a chest X-ray is used, the symptoms are always detectable. The detection of this disease is a vital necessity not only for the sufferer himself but for his loved ones and associates. TB is a contagious disease and a person who does not realize that he has it will be exposing his family, friends, and others with whom he comes in contact to the danger of getting the disease. Therefore, the annual chest X-ray is extremely important for the patient and for the public at large because only through annual chest X-ray examinations can we
be confident that TB symptoms are detected.

One extremely important aspect of the chest X-ray examination is that it can detect the disease in its very early stages, when it is easily cured. Since TB destroys lung tissue, it is extremely important to diagnose and treat it as soon as possible, for the earlier it is discovered, the greater are the chances for a quick and complete recovery. Once the disease is discovered, modern medical treatment can stop further destruction of the lung tissue, but it cannot restore the tissue already damaged before the disease was discovered. The annual chest X-ray assures early detection of the disease when treatment is so simple that in most cases the patient does not even have to be hospitalized. If the disease is not diagnosed until the more obvious symptoms appear and the disease is in the advanced stages, it may be too late to avoid serious and even fatal consequences. Treatment of TB in the late stages takes a long time and is quite expensive. And even if the patient lives, the disease has usually caused so much damage that he is partially incapacitated for life and is exposed to the danger of a later re-occurrence of the disease. On the other hand," urged the distinguished scientist, "if we faithfully carry out the necessary precaution of getting an annual chest X-ray, we can be sure of quick and successful cure and prevent TB from ever again becoming the No. 1 killer in the U.S."

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Appendix I

Supportive and Refutational-Same Counterarguments
Some Dangers of Excessive Tooth Brushing

Dr. Steven A. Wright opened his address by noting that "many people brush their teeth more or less automatically after each meal without realizing that of late, medical reports have been calling this procedure into question. Recent medical and biological studies indicate that the beneficial effects of constant tooth brushing have been exaggerated. Furthermore, it has been demonstrated that a number of bad effects can result from brushing teeth so often. Constant gum irritation can result in infection and even mouth cancer. Also, brushing teeth so frequently tends to push back the gums and expose the non-enameled parts of the teeth to decay. Hence, medical authorities are beginning to urge that instead of brushing our teeth so frequently, we take other measures to improve dental health, such as a better diet. Let us review some of this recent evidence demonstrating that constant tooth brushing does not do any great amount of good and can do much harm.

Dr. Wright continued his address by observing that "the most undesirable effect of tooth brushing is the damage it causes to the gums. All of us must have noticed that when we brush our teeth, we often cause our gums to bleed. Such bleeding, obviously, indicates some degree of gum injury. These injuries, besides the physical damage they cause, increase the likelihood of infection. Doctors generally concede that most serious gum infections result from accidental injury to the gums inflicted during tooth brushing. Furthermore, repeated injuries of the gums caused by constant tooth brushing can, even when each of these injuries is only slight, produce mouth cancer. Also, frequent brushing can actually increase rather than decrease the amount of tooth decay by exposing the unprotected areas of the teeth to the decay-causing bacteria. Nature has given our teeth a very good protection: the enamel sheath. This sheath covers only the exposed portions of the teeth: there is no enamel under the portions covered by the gums. Tooth brushing pushes back the gums and exposes those unprotected parts of the teeth to decay-causing bacteria. It is apparent, then, that too frequent brushing can cause gum infections and even mouth cancer, and may increase rather than diminish the amount of tooth decay.

"Even the enamel itself can be damaged by constant tooth brushing. Many tooth pastes and powders have been
found to contain harsh abrasives which tend to wear down this enamel. This wearing and pitting of the enamel opens still another path by which the decay bacteria can destroy the teeth. The presence of some harsh abrasives is required in both tooth pastes and powders in order for these dentifrices to do an adequate job of making our teeth look clean. It is, therefore, inevitable that some harm is done to the enamel whenever we brush our teeth. While the abrasive effect of such brushing is very slight, the accumulated effects of constant brushing can be disastrous. The highly acclaimed Dr. Wright noted in conclusion, "that the realization that brushing after every meal can well cause more harm than good has prompted many dental authorities to discontinue the recommendation of constant tooth brushing as a general health measure."

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Some Dangers of Excessive Tooth Brushing

Dr. Jason Lewis opened his address by noting that "many people brush their teeth more or less automatically after each meal without realizing that of late, medical reports have been calling this procedure into question. Recent medical and biological studies indicate that the beneficial effects of constant tooth brushing have been exaggerated. Furthermore, it has been demonstrated that a number of bad effects can result from brushing teeth so often. Constant gum irritation can result in infection and even mouth cancer. Also, brushing teeth so frequently tends to push back the gums and expose the non-enamed parts of the teeth to decay. Hence, medical authorities are beginning to urge that instead of brushing our teeth so frequently, we take other measures to improve dental health such as a better diet. Let us review some of this recent evidence demonstrating that constant tooth brushing does not do any great amount of good and can do much harm.

Dr. Lewis stated that "the most undesirable effect of tooth brushing is the damage it causes to the gums. All of us must have noticed that when we brush our teeth, we often cause our gums to bleed. Such bleeding, obviously, indicates some degree of gum injury. These injuries, besides the physical damage they cause, increase the likelihood of infection. Doctors generally concede that most serious gum infections result from accidental injury to the gums inflicted during tooth brushing. Furthermore, repeated injuries of the gums caused by constant tooth brushing can, even when each of these injuries is only slight, produces mouth cancer. Also, frequent brushing can actually increase rather than decrease the amount of tooth decay by exposing the unprotected areas of the teeth to the decay-causing bacteria. Nature has given our teeth a very good protection: the enamel sheath. This sheath covers only the exposed portions of the teeth: there is no enamel under the portions covered by the gums. Tooth brushing pushes back the gums and exposes those unprotected parts of the teeth to decay-causing bacteria. It is apparent, then, that too frequent brushing can cause gum infections and even mouth cancer, and may increase rather than diminish the amount of tooth decay.

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Some Harmful Effects of Chest X-Rays

Dr. Paul Craddock opened his address to the members of the American Medical Association by emphasizing the "medical associations and public health authorities have recently begun to question the wisdom of repeated X-ray examinations for detecting TB. Exposure to radiation—even the small amount encountered in the X-ray examination—has come to be recognized as a danger to health. Exposure to radiation can produce bone cancer as well as leukemia (cancer of the blood). The radiation produced by X-rays is also extremely damaging to reproductive tissues, resulting in sterility of "defective" children. Let us examine in more detail some of the evidence that has led public health officials to advise against the dangerous exposure to radiation involved in repeated chest X-rays.

Craddock continued the address by remarking that "one of the most serious hazards involved in X-ray diagnosis, is the possibility that repeated exposure to this type of radiation will produce cancer. In recent years there has been an alarming increase in the incidence of bone cancers, leukemia, and related malignant diseases. Studies on the effect of atomic fallout have shown that this alarming increase can be traced, at least in part, to the supposedly small amount of radioactive waste given off by these nuclear bomb tests. Exposure to any kind of radiation—gamma rays, X-rays, etc.—allows powerful invisible particles to penetrate to the vulnerable tissues deep within our bodies, damaging these tissues and producing malignant tumors or "cancer." Scientists at Stanford Medical School recently exposed monkeys to regular X-ray radiations and found that 85% of these animals developed cancer at the region of exposure after ten such treatments. In humans, X-rays are particularly likely to produce bone cancer and leukemia (a form of cancer affecting the white blood cells). Because of this grave danger, it is essential that we keep X-ray dosage at a minimum and not undergo X-ray examinations for TB (or any other disease) routinely each year. Rather we ought to confine our exposure to these dangerous radiations to the rare occasions when there is some positive reason for suspecting the disease and upon specific recommendation of a physician.

"Another danger involved in X-ray examinations is that radiation is particularly damaging to the reproductive tissue. Hence, X-ray examinations can cause sterility,
that is, inability to have any children, or if they do not produce complete sterility, there is the highly undesirable possibility that the damage to the reproductive tissue will produce radical changes in the chromosomes and genes of the germ cells, thus causing mutations. Children born of such damaged germ cells tend to have serious, often fatal defects. Probably the major cause of the current rise in the number of defective births is the increased amount of radiation to which we are now being exposed. These mutations may develop slowly and progressively and go undetected for generations. To avoid such damage to the germ cells we should limit our exposure to radiation of all sorts, including routine X-rays. For our own good," observed the distinguished Dr. Craddock, "and for the sake of generations yet unborn, we should restrict our exposure to a minimum, and have X-rays taken only on individual medical advice."

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Some Harmful Effects of Chest X-Rays

Dr. Theodore D. Woolsey opened his address to the gathering of civic club members by emphasizing that "medical associations and public health authorities have recently begun to question the wisdom of repeated X-ray examinations for detecting TB. Exposure to radiation--even the small amount encountered in the X-ray examination--has come to be recognized as a danger to health. Exposure to radiation can produce bone cancer as well as leukemia (cancer of the blood). The radiation produced by X-rays is also extremely damaging to reproductive tissues, resulting in sterility or "defective" children. Let us examine in more detail some of the evidence that has led public health officials to advise against the dangerous exposure to radiation involved in repeated chest X-rays.

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Appendix J

Filler Essays
The Orlando Sentinel Star carried the following news story recently, citing automobile exhaust as the major source of air pollution in the United States today, and attributing the substantial increases in respiratory illnesses to the toxic effect of carbon monoxide emissions. The full text of the Sentinel story follows:

EXPERTS AGREE: AUTOMOBILE IS MAJOR SOURCE OF AIR POLLUTION IN U.S.--Rise in Respiratory Illnesses Result

"As any student of the late-late show will testify, carbon monoxide can kill! Unfortunately, this invisible, odorless, and tasteless gas is having its effect on the American population in scenes less dramatic than the start-the-engine-close-the-garage gambit seen on late night television. Records available from the Environmental Protection Agency prove conclusively that the automobile is the major source of air pollution in the United States today. Through a scientific procedure of obtaining and analyzing air samples from metropolitan population areas, the Environmental Protection Agency was able to substantiate that as much as 85% of the air pollution in the United States today is caused by automobile emissions. Substantial increases in lung and respiratory diseases have been attributed to the toxic levels of carbon monoxide emitted from the internal combustion engine. Yet, from time to time, stories by well-intentioned but misguided reporters are published claiming that the major source of air pollution is not from automobile exhaust, but aircraft engine emissions. Often these stories seem, on hasty examination to be reasonable, but a closer look shows us that they are based on distortions of the facts and are misleading. While no one would claim that aircraft emissions do not contribute a percentage of the total air pollution, it is easy to demonstrate by scientific facts and figures that aircraft emissions are far from being the major source of air pollution in the U.S. Because air pollution poses such a serious threat to our society, and because distorted arguments have circulated widely attributing the major source of air pollution to aircraft emissions, it will be useful to review here some of these misleading arguments and to show where their errors lie.

"One of these misleading arguments is based on the fuel actually dumped by the thousands of jet and turboprop aircraft following take-off from major airports around the
United States. This automatic dumping of residual fuel is a standard procedure of jets operated by U.S. scheduled airlines and actually poses little threat to us or to our environment. As a matter of fact, the kerosene which is dumped by the aircraft after take-off is vaporized immediately upon discharge and wind currents prevent any measurable concentration on the ground. Furthermore, most aircraft fly either the biosphere, which is the layer of air we breathe, or near the outer limits of the biosphere before dumping their excess fuel, and there is little or no chance of the vapors accumulating near the ground level as is the case with automobile exhaust. In contrast, the internal combustion engine which is used to power most street transportation, emits hydrocarbons and nitrogen oxides which mixes with soot and dirt to cause a photochemical smog, a phenomenon which is especially familiar to residents of the Los Angeles basin. Furthermore, in laboratory conditions, concentrations of 30 parts per million carbon monoxide for eight to 12 hours have been shown to raise the body's hemoglobin from its normal level of 0.04 percent to five percent. Equating these levels with actual conditions, a study has noted that concentrations in Los Angeles are as high as 27 parts per million for as long as eight hours, and during rush hours go up to 38 parts per million for one-hour periods. Such phenomenon does not occur with either the exhaust or excess fuel emitted by the aircraft in our skies, and there is little or no evidence to support the contention that they are the major source of air pollution.

"Another misleading argument supporting aircraft exhaust and emission as the major pollutant, has to do with ground observations of high speed aircraft. The visible exhaust plume that can be seen trailing behind aircraft and the increased levels of exhaust odors at airports has led to the fallacious argument that aircraft are bigger polluters. Due to the inefficiencies of the present day aircraft engines, the exhaust is much more visible than that of the automobile, yet we have all stood on the intersection of a busy street corner and breathed in the noxious and often odorous high concentrations of carbon monoxide. Even with the modern smog control devices on the automobile's internal combustion engine, experiments conducted throughout the country by both government and private research agencies prove beyond doubt that automobile is still the major cause of air pollution.
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Date August 6, 1974

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY William Gene Matthews ENTITLED The Relative Efficacy of High and Low Credible Sources in Immunizing Refutational-Same and Supportive Defenses Against Belief-Reducing Counter-arguments BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Communication.

Director of Thesis

Director of Degree Program

Recommendation Concurred In:

Committee on Final Examination