

UNIVERSITY OF MANITOBA

Thesis

RESISTANCE TO PERSUASION AS INCREASED BY SOCIAL INFLUENCES

AN EXPANSION OF MCGUIRE'S THEORY OF INOCULATION

Submitted by

Mary Catherine Casserly

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ABSTRACT

An experiment by Anderson and McGuire (1964) was used by the author as the basis of this experiment which extended the Theory of Inoculation. This theory of how resistance to persuasion can be developed was extended to include certain social influences which had not been considered previously. The purpose was to demonstrate that the social co-operation of individuals involved in the same task increases the amount of resistance to persuasion which is demonstrated. In addition, reassurance that a reference group holds a belief increases a person's adherence to it when that belief is attacked. These hypothesis were supported. With certain exceptions the experimental paradigm replicated that of Anderson and McGuire (1964) except that in one condition subjects were encouraged to interact rather than to co-act on a task and they were also given reassurance that the students on the campus of the University of Manitoba either accepted or maintained mixed feelings regarding the efficacy of chest X-rays which had just become compulsory for all students and staff on campus. We supported their findings with regard to the effectiveness of any pre-treatment prior to an attack and the importance of challenging a belief which has existed in an ideological monolithic environment. However, contrary to Anderson and McGuire's results, we found the supportive treatment to be effective and demonstrated the positive influence of reassuring a person that a belief is held by a group when subjects were co-operating on the defence of that belief.

A human being is a social animal operating within a social environment. Subtle forces are acting on man continually which influence his ideas, his attitudes and his actions. These forces tend to be varied and contradictory and if they were of equal strength could cause a persons's beliefs and values to be in a continual flux. Everyday observation, however, indicates to us that stability is a dominant characteristic of man. This stability results from man's resistance to the persuasiveness of the social and psychological influences of his world. How this resistance has been developed has been examined by such researchers as McGuire (1961), Anderson (1962), Manis and Blake (1963), McGuire and Papageorgis (1961) and Tannenbaum (1967). Their findings have indicated crucial factors in the maintenance of an attitude including pre-exposure to contradictory ideas and the effect of the prestige of the source of these ideas. But certain important factors have been ignored including the effect of a reference group and the method by which a person practises resistance to the persuasive forces. We have attempted to take these variables into account. To do so we have employed the heuristically rich model of William McGuire and his associates.

#### McGuire's Theory of Inoculation

One of the most important theories dealing with resistance to persuasion is McGuire's Theory of Inoculation which examines the maintenance of a belief which has been attacked. This explanation of why resistance has developed is based on an analogy to medical inoculation.

He has developed the psychological equivalent of the events which occur when the body resists infection from alien viri.

There are two basic kinds of therapy which an individual can receive to fight a disease: supportive and preventive. Supportive therapy is characterized by the fact that it reinforces the tendency toward good health. When one has caught a cold he may take drugs to speed his recovery and to make him feel better as he is doing so. These drugs have not necessarily extinguished the strength of the germ but they do make the patient feel better as he is recovering. Supportive treatment in McGuire's theory is employed in a similar fashion. When a person's belief is attacked, he receives support that despite contrary evidence what he thinks is still correct. In later attacks, he will tend to continue to maintain this belief.

Preventive therapy, on the other hand, neutralizes the effect of an attack. When a person is inoculated with a small amount of a germ, the resources of his body enable him to successfully overcome its strength. Consequently, he develops an immunity to later, stronger attacks by the same strain. McGuire has designated the refutational defence treatments as the psychological equivalent of immunization. By presenting arguments which an individual can refute, he can be vaccinated so that he accepts his belief as valid despite any conflicting evidence to which he might be exposed at a later date.

These defences are of two types: refutational-same and refutational-different. In the first case, a person is led to see the weaknesses in an attack and how they can be refuted. Later, in a

massive counterattack he is presented with the same arguments so that he can easily repeat what he has already learned. For example, a person may learn that he should brush his teeth frequently. When this belief is attacked because someone indicates the cost of the toothpaste, he can refute this argument by indicating the greater cost of dental surgery when toothpaste has not been used in the care of the teeth. At a later date he may encounter this same argument but having defeated it once, he can easily recall the necessary facts involved in the resistance to a persuasive attempt.

A refutational-different defence is similar except that the argument that the person encounters during the subsequent attacks are novel. This time, for instance, he might be told in the attack that brushing one's teeth is injurious to the gums. His previous refutations are not necessarily applicable but having overcome one set of arguments, he is supposed to be able to generalize and so he might respond that it is not the brushing which is harmful, but rather the incorrect manner of brushing. McGuire (1961) has concluded that man can be inoculated against alien ideas by being taught how to reject them in their relatively weak state. This is the bases for his theory of resistance to persuasion.

#### Cultural Truisms

In order to examine beliefs and manipulate them through the various treatments involved in McGuire's theory, it was necessary that he employ concepts which existed in an ideologically monolithic environment: that is, he had to use concepts from a non-contaminated



environment which had never received either supportive or refutational defences and, in fact, had never been part of any controversy. McGuire employed cultural truisms which are beliefs accepted without question by members of a culture. Typical of such a truism is the belief that people should brush their teeth regularly.

#### The Defensive Treatment of Beliefs

McGuire (1961) originally postulated that these truisms, although they appeared strong, were actually quite vulnerable to persuasive attacks because the individual could not make the appropriate defensive reactions for two reasons. These reasons were; first, the lack of practice in defending these beliefs, and second, the lack of motivation to practise. Having never had any reason either to question or to defend his beliefs a person does not consider the possibility of such a situation arising. This leaves him extremely vulnerable to any strong attack in the same manner that an organism is susceptible to a virus which has never previously been encountered nor successfully resisted in a weaker strain. However, if a person does become sick, the illness will be of less intensity if, up to this time, he has been in good health and continues to take care of himself. In addition to this supportive therapy, preventive therapy will decrease the effectiveness of the germ. It follows then, that any defence prior to an attack is superior to no pre-treatment at all (McGuire, 1961).

One criterion of an effective pre-treatment is that it stimulate a person in such a way that he feels capable of resisting any attack. It becomes a form of armour which is not easily penetrated.

McGuire (1961), McGuire (1962), McGuire and Papageorgis (1961), and Papageorgis and McGuire (1962) found that intrinsically threatening defences of the refutational treatments provided more resistance to later persuasive attacks than did completely reassuring defences of the supportive treatment. To apply the biological analogy again, a susceptible individual should be exposed to a mild strain of a new virus rather than receive supportive therapy. In addition, McGuire (1964, p. 206) stated that: "The immunizing efficacy of the refutational defences derive at least as much from the threatening prior mention of the attacking arguments which had been mentioned as from any actual defence which is activated." This conclusion was based on the results of Anderson (1962), McGuire and Papageorgis (1962) and Papageorgis and McGuire (1962). Therefore, this basic postulate of inoculation theory that the intrinsically more reassuring supportive defences would be less effective in conferring resistance to subsequent attacks than the intrinsically more threatening refutational defences should also be found in experimental replication such as the present study.

The strategy of the refutational treatment is to provide the motivation and material for the defence "by making him (the victim of the attack) aware of the vulnerability of the truism.... (and by giving him) careful guidelines in developing defensive materials." (McGuire, 1964, Pp201-202) The individual can act on these guidelines in two ways: actively or passively. Active participation requires that the subject give of his own abilities

in developing his resistance. Under such a condition McGuire required a subject to write an essay. The individual was given points to expand upon but it was up to him to develop them in any way that he should choose. Passive participation requires a person to become aware of the relevant arguments for his belief. In general, this requires an individual to read an essay in support of the truism and underline the pertinent points. There are other ways that each of these general approaches can be applied. The present study employed McGuire's usual method of essay writing as well as introducing group dialogue in the application of this theory. The latter consisted of members of a small group working together on the defence with an emphasis on verbal interaction.

Forced-compliance studies (Kelman, 1953; King and Janis, 1956; Brehm and Cohen, 1962) have usually found that active participation in the defence of a belief opposing one's views generally augments the amount of internalized change. However, McGuire and Papageorgis (1961) hypothesized that in the case of defending already accepted truisms, the opposite prediction would hold: namely, the greater the active participation requirement, the less the conferred resistance to subsequent attack. They felt that the individual would be overcome by the perceived difficulty of the task and, not having a background of resources, would feel incapable of defending his belief. Therefore, he would accept opposing arguments as valid and be persuaded by them. The passive participants, on the other hand, only have to indicate what the specific arguments are and they are aware that a strong case can be made for their belief. Because of this, they should be

resistant to counterarguments. Their hypothesis was confirmed both in this study and in subsequent ones (McGuire, 1963 a; McGuire, 1963,c). However, these later studies also showed, in addition, that the sizable superiority of reading over writing (that of passive over active) which was demonstrated in the first study did not hold for the refutational-different. The converse held that if a person was to be faced with a novel counterargument at a later date, he was apt to be more resistant to them if he had developed his own arguments during his inoculation. He could then generalize his refutational abilities to this new situation better than if he were attempting to generalize another person's arguments to a different attack. It would appear that the more effort and involvement that is required in the defensive pre-treatment, the greater should be the increase in the effect of inoculation in the refutational-different case. Because the present study demanded active participation and the involvement of the subject, then, theoretically, the refutational-different group should have the strongest resistance to persuasion of any of the defensive treatments.

#### The Importance of Co-operation in Resistance to Persuasion

McGuire's theory contains the important concept of pre-treatment so that a person is aware that his belief can be challenged and because of this, he will practise so that he will be prepared to handle this challenge when it arises. This is a process which goes on continually outside the laboratory situation. In a meeting of the Alcoholics Anonymous, the alcoholic is motivated to resist further temptation by his colleagues who insist on a public rehearsal of

the case for temperance.

However, the theory tends to ignore the context within which a phenomena such as resistance to persuasion is likely to occur. The usual procedure in a psychological experiment and the one employed by McGuire and his associates is to have large numbers of introductory psychology students gather in a room. The subjects are then exposed to the particular variable and the experimenter attempts to generalize these resulting findings to "the real world". But one can question legitimately whether this real world actually does function in such a manner. Students, in convincing themselves that a professor is poor, gather in a lounge and take turns pointing out his faults. Football fans in an office all decide that the home team won't be beaten in the coming year because of the innumerable qualities of the players. People who know each other can work together on developing resistance to persuasion. Jackson and Saltzstein (1958) defined a group as a unit in which people feel "psychological membership". It is groups which occur in the natural social environment of man and it is groups, not assemblies, that should be examined for their effect on the phenomenon of resistance to persuasion.

Deutsch and Gerard (1955) have pointed out that in a typical experiment examining social influences on human behaviour a subject is not given experimental instructions which make him feel that he is a member of a group faced with a common task requiring co-operative effort for its most effective solution. In the usual experiment, subjects are required to co-act rather than to interact. This seems to

be removal from the ordinary course of events.

In a society, it is the members which maintain the uniqueness of that society despite all the hostile forces opposing it. If the society is to survive it is necessary that its individual members be resistant to the attacks on the beliefs held by his group. Therefore, the present study proposed to study inoculation which occurred in the interacting groups as well as in the more usual co-acting assemblies which had been examined previously by McGuire. Because man has been socialized to function within the group, we hypothesized that this factor would be crucial to the development of resistance to persuasion.

#### The Effect of Reassurance on One's Belief

If a belief is important to a group, the members of that group will be aware that they should hold this belief. Sherif (1935) in one of the original studies on the effect of the reference group found that not only was the person's judgment influenced by other people's judgments but also that this modified norm judgment tended to persist in the absence of those who were originally instrumental in shaping it. Later work by Gerard (1954) found that the more firmly were beliefs anchored to a reference group the less susceptible they were to social influence to change this opinion. Argyle (1957) provided further evidence that people conform to the norms of their reference groups or group to which they wish to belong. Furthermore, Festinger (1963, p. 239) has stated that: "Groups toward which a member is highly attracted are more successful in influencing his opinion than are groups toward which his attraction is weak." Hovland (1959) and Sherif, Sherif, and Nebergall

(1965) have also made the important point that when subjects enter the laboratory they do not leave their reference groups at the door.

One method by which an individual knows what belief his reference group holds is that he receives reassurance from them that they are in agreement about a topic. In a sports-oriented school, a student gains more recognition for making a particular team than he does for being first in the class and thus is reassured that his athletic approach to school is better than a more scholastic approach. In the present study, we assumed that the general population of the University of Manitoba served as the reference group for the average Introductory Psychology student and that he would be influenced by the supposed acceptance of the cultural truism, or lack of it, which was indicated by this group. This supposed acceptance should be important in maintaining resistance to any persuasive attempt to change the belief.

#### Group Reassurance as Examined by Anderson and McGuire (1964)

Anderson (1962), one of McGuire's students, has studied this variable of prior reassurance of belief by the group within the experimental paradigm formulated by McGuire (1961). According to this interpretation, any reassurance should have the effect of making the person complacent in his belief that he is correct in what he believes or thinks. Therefore, such prior knowledge should have the effect of causing the reassurance to detract from the threat contained in the defences. The result would be to decrease a person's motivation to practise. Anderson (1962) and the follow-up article by Anderson and

McGuire (1964) hypothesized that a highly reassuring defence conferred less resistance to a subsequent persuasive attack than did a more threatening defence. Their explanation is based on previous findings by McGuire (1961) and McGuire (1963) that it was necessary to threaten a person rather than to further reassure him about the validity of his belief before a person would be stimulated to develop his defences and acquire resistance to persuasion. Because of this effect, they also predicted that the prior reassurance would have less detrimental effect on the immunizing efficacy of the refutational defences as compared with the supportive defences, since the refutational contained the intrinsic threat of the attacking arguments.

#### Method

To examine these variables of defensive treatments and reassurance Anderson employed McGuire's basic paradigm. For each of four different truisms, three types of messages were used: two refutational defences and a supportive defence. In addition there were two sets of attacks used in the massive counterarguments.

Each of the ninety-six introductory psychology students who were used as subjects served in four conditions, each involving a different truism and a different pre-treatment. These conditions were: supportive, refutational-same, refutational-different, and a control condition in which subjects received no pre-treatment and only the attack.

The cover story given to the subjects was that this task was a test of analytic thinking ability and scientific aptitude developed to identify gifted individuals. They were asked first to complete a "Group



Consensus Information" sheet which contained statements of twelve health truisms each accompanied by a fifteen point graphic scale. The value of '15' was given to the end of the scale which indicated acceptance of the cultural truisms, and a value of '1' was given to the opposite end. Subjects were asked to fill in the chart. Then, while the students completed a 66-item personality inventory, an assistant 'busily' and openly computed group averages for each of the items. These items were actually predetermined so that one-half the subjects heard an average mean of 14.50 on the items which were to be attacked and one-half heard a mean of 7.50. The former level indicated almost total unanimity and thus high reassurance and the latter, a great lack of consensus among the members of the group and thus none reassurance of the belief. The crucial manipulation consisted of having the students record these mean beliefs beside the truisms so that they were aware of the apparent typical opinion on these issues.

The next step was the defensive pre-treatment and the attack by the presentation of the massive counterarguments. Subjects were given seven pages of essays to read and underline. This demanded passive participation by the subjects. The first three pages contained one supportive essay, one refutational-same and one refutational-different. The next four pages, which the subject read immediately afterwards, consisted of an attack of the four previously reassured items.

In order to measure the resistance to persuasion, subjects were given a short multiple-choice comprehension test on the reading material, a background information questionnaire and then a 17-item

questionnaire designed to measure their personal beliefs on the truisms. This questionnaire was almost identical to the one administered in the first part of the experimental session. This was followed by a post-experimental questionnaire.

### Results

The results are indicated in Table 1. The hypothesis were supported. Of the defensive treatments, the refutational-same was the most effective followed by the refutational-different. The supportive was just slightly less effective than no defence at all. The second hypothesis was also supported: namely that prior reassurance had a detrimental effect on the immunization treatment. In addition, reassurance had a more detrimental effect on supportive defences than on the refutational defences confirming the hypothesis dealing with the interaction effect.

### Alternative Explanation for Anderson and McGuire's Findings

The introduction of the concept that prior reassurance of group consensus as a factor in producing resistance to persuasion is an important contribution to the theory. As such it deserves to be explored further. However, certain of Anderson and McGuire's fundamental assumptions may be questioned. The first is that the reading and underlining of essays is not the typical method by which a person's beliefs are supported or attacked. Rather it is through interaction that a typical immunization results. Allen (1961, p. 146) has stated this position well: "The greater effect of the face-to-face group may not be the result only of mere public compliance. Instead

TABLE 1

Final Belief Levels with and without Reassuring Feedback of Peer Group Adherence before the Defences as reprinted from Anderson and McGuire (1964)

Feedback Condition	Defence and Attack Condition				
	Neither Defence Nor Attack	Refuta-tional-Same Defence	Refuta-tional-Different Defence	Supportive Defence	Attack Only (No prior defence)
Reassurance	12.40	11.52	10.80	9.58	10.20
No reassurance	12.68	12.12	11.41	11.06	10.74
Combined	12.54	11.82	11.10	10.32	10.47

Note. A score of 15.00 indicates complete adherence to the truism.

in the more public situation the group may be regarded as more convincing." Therefore, we suggested that the defensive pre-treatment would be more effective where interaction, rather than the usual co-action, model, is employed.

Secondly, Anderson and McGuire's definition of what constituted reassurance is questioned. Anderson and McGuire stated that the reassurance originated from the questionnaires that the subjects had completed. Yet, because one is in the same physical setting with strangers it does not follow that he would arbitrarily accept their views as his own. In fact, if he knew that he had rejected the truth of the statement and perhaps that others had done likewise it is possible that he could have questioned the authenticity of all the values which he was given by the assistant who had scored the papers. As has been explained earlier in this paper, an individual is more apt to refer to the values of his reference group in determining his resistance to persuasion than he is to accept the values of strangers. The general student population was assumed to be a more important source of relevant reassurance than people drawn at random from this whole and with whom the subject would never have much continuing contact.

In addition, some of the strength of Anderson and McGuire's obtained results possibly are due to demand characteristics inherent in the experimental paradigm which was used. Orne (1959) has demonstrated that the 'good' subject will respond to the cues provided to him in an attempt to validate the experimenter's hypothesis. The original

procedure included an attitude measure, a personality inventory, reading of seven essays containing the defensive treatments and massive counterattacks immediately followed by a post measure of attitude change. In this situation it would seem apparent even to the most naive subject that some change is required of him. Otherwise, why would the experimenter measure his personal feelings twice within one hour if he were really only interested in his "analytical abilities to read". To measure the phenomena of inoculation as precisely as possible it was necessary to eliminate the variance due to these demand characteristics.

#### Methodological Alterations from Anderson and McGuire (1964)

The basic design of the present study has been adopted from that used by Anderson and McGuire (1964) but certain important alterations have been introduced. First, their definition of the constitution of a group has been rejected. Under this variable, two levels have been employed: the first, co-acting individuals replicated that of the original study; the second emphasized the necessity of interaction and had teams of five working together in the various treatments.

Another change has been made in the specified source of reassurance. This study attempted to use an external reference group of the university population while Anderson and McGuire based theirs on the supposedly obtained scores from the experimental group.

In addition, an attempt was made to eliminate some of the demand characteristics which seemed to be evident to use in the original study. Anderson and McGuire had administered numerous tasks, many of

which seemed to detract from the understanding of the experiment and of its results. Therefore, we eliminated the pre-measure of attitude toward the truisms. The personality inventory was also deleted as an attempt to reduce evaluation apprehension and to lessen the very obvious 'busy-ness' of the experimenter who was required to compute the scores of the attitude measure rapidly during this period. Also, the post-measure of resistance to persuasion was disguised as a survey conducted by a neutral external organization and was presented as part of a program unrelated to the present situation.

In the original design the subjects were attacked on four different truisms, for each of which they were given different pre-treatments. Previous research (McGuire, 1961; McGuire, 1963) had shown that the truth of these truisms was not judged by the subjects to be significantly different. Therefore, subjects in the present study were all exposed to the same truism and to only one type of pre-treatment for each subject. Because of this change they were not as likely to be made aware that a different type of defence was possible for their belief.

Finally, Anderson and McGuire required passive participation of their subjects. Because the definition of the group as an active body was one of the independent variables in our study, such an approach was not possible. Therefore, two kinds of active participation were used: the first was the writing of an essay by the individual subjects; the second was the group dialogue to develop the defence.

These alterations were designed to increase the clarity of the

original design while still permitting a certain amount of comparison between the two experiments. In addition, one of the main purposes of this study was to apply McGuire's Theory of Inoculation in a more typical setting and to take into consideration some of the other factors which tend to influence a person in such a situation.

### Statement of the Hypotheses

#### Main Effects

Hypothesis I: The Effect of Co-operation in the Defence of a Belief

Where specific orientation is given to unify members, then individuals in this interacting condition should be more resistant to attempts at persuading them than are subjects not given this orientation to function co-operatively.

Hypothesis II: Level of Reassurance of Belief

Where reassurance about the validity of one's belief is seen as originating from an important external reference group, the kind of reassurance received will determine the stability of one's belief when it is attacked: that is, if the reassurance is one indicating high uniformity of opinion with regard to the acceptability of that belief, then the individual should tend to maintain that belief in the face of opposition to it to a greater degree than the individual who has received lower reassurance regarding the acceptance of that belief by his reference group. (This is in opposition to Anderson and McGuire, 1964)

Hypothesis III: Defensive Treatment of a Belief

Any defence prior to an attack on a belief is superior to no pre-treatment at all. (This is a basic postulate of the Theory of Inoculation.)

Hypothesis IV: Types of Defensive Treatment of a Belief

Within the defence condition, the intrinsically more reassuring supportive defences should be less effective in conferring resistance to the subsequent attacks than the intrinsically more threatening refutational defences. (This is a basic postulate of the Theory of Inoculation.)

Hypothesis V: The Efficacy of the Defensive Treatments of a Belief

Of the three defensive pre-treatments, the refutational-different should confer the greatest resistance to persuasion where subjects are required to participate actively. (This is based on McGuire, 1963).

Interaction Effects

Hypothesis VI: Co-operation and Type of Reassurance

Where a subject can work as a member of a team which is defending a belief, and, in addition, receives positive external reassurance from a reference group of the acceptability of that belief, then he will tend to show a greater resistance to persuasion than one who has received high external reassurance about that belief: that is, the amount of reassurance has an inverse relationship for subjects who



co-act rather than interact and in such a case no reassurance is more effective in resistance to persuasion.

Hypothesis VII: Co-operation and Defensive Pre-treatment of a Belief

If the subject is interacting in the defence of his belief, then resistance to persuasion will be greater in the refutational-different condition than in either of the other two defensive pre-treatments because the subject may feel that because the group has effectively rebutted one set of arguments, it is capable of doing so again. However, where the subject is co-acting, the refutational-same treatment should be the most effective because it requires no further effort by the subject for the refutation of the counterarguments and the maintenance of his belief.

Hypothesis VIII: Level of Reassurance and Effectiveness of the Defensive Pre-treatments of a Belief

High reassurance of the acceptance of a truism by an important external reference group will tend to increase the effectiveness of the refutational defences and decrease the effectiveness of the supportive treatment. Low reassurance should have an inverse effect.

Hypothesis IX: Co-operation, Type of Reassurance and Defensive Pre-treatments of a Belief

A. Where subjects are exposed to neither a defensive pre-treatment nor to an attack on their belief, they should indicate the greatest.

acceptance of the truism, especially those receiving high reassurance as compared to low reassurance. The variable of co-operation is not likely to be effective in such a situation.

B. Where there is no pre-treatment prior to an attack on a belief, then the subjects receiving high reassurance of a belief should be more resistant to persuasion than those subjects not receiving this reassurance from the external reference group.

C. Within the supportive condition, the subjects who should exhibit the resistance to persuasion are those interacting subjects in the low reassurance condition followed by co-acting individuals who received low reassurance. Highly reassured subjects should be less effective in their resistance to persuasion.

D. Within the refutational-same defensive pre-treatment, the interacting subjects receiving high reassurance should be the most effective in resisting persuasive manipulations and low reassured interacting subjects the least effective. The low-reassured co-acting subjects should be more resistant than the highly reassured subjects to the persuasiveness of the massive counterarguments.

E. Within the refutational-different condition the interacting subjects, especially those who have been highly reassured should be the most resistant to persuasion than co-acting subjects, especially if they have been highly reassured.

## METHOD

### Design

This experiment was disguised as a project conducted by the Manitoba Department of Health and Social Services through the co-operation of the Department of Psychology of the University of Manitoba. Because it sometimes happens that other groups use the subject pool this cover story is basically plausible. The agency was presented as trying to develop a campaign to convince students of the necessity of chest X-rays. Ostensibly, they intended to use the reasons in favour of the X-rays which were advanced by the students themselves.

The experimental design consisted of three factors in a 2 X 2 X 5 combination. The first factor was the level of co-operation. Subjects served either as members of an interacting team who co-operated on a task or as co-acting individuals who performed in the presence of other subjects but did not work toward any group goal. The second factor was the level of reassurance given to the subjects. They were told either that campus opinion favoured annual chest X-rays, or that campus feeling was mixed. The third factor consisted of the three defensive treatments and two control conditions used by Anderson and McGuire. The three defensive treatments were as follows: in the first, the supportive treatment, subjects were given communications which served to affirm the validity of the belief and which was to be attacked later by the negative arguments. In the second, refutational-same, subjects refuted the same arguments in the attack as they had

during the period of inoculation. The third defensive treatment was the refutational-different condition where the subjects were asked to refute arguments in the defensive treatment which differed from those they had to refute in the attack. There were two control groups: the neither-defence-nor-attack group received only the post-measure and no other defensive treatment; the attack-only-no-defence group received the massive counterattack against the truism as well as the measure of belief but did not receive any defensive treatment.

No pre-measure of belief was taken in any of the groups. We attempted to disguise the post-measure of belief as a survey taken for a different reason by the Manitoba Department of Health and Social Services.

The outline of the experimental procedures is presented in Table 2. The interacting condition differed from the co-acting individual condition in that while both had to participate actively in the defence, in the former this was a team approach by people who had been introduced to each other and in the latter, the individual worked with a minimum of interaction with other subjects. These subjects sat in a large classroom and worked silently on their task under the supervision of the experimenter who allowed no talking.

### Subjects

The subjects were one hundred and eighty female subjects and one hundred and twenty male subjects registered in the Introductory

TABLE 2  
Outline of Experimental Procedures

VARIABLES	Defensive Treatments				Attack Only
Levels of Defence	Neither Attack Nor Defence (Control Group 1)	Supportive Defence	Refuta- tional-Same Defence	Refuta- tional-Different Defence	No Defence (Control Group 2)
Reassurance Manipulation	INTRODUCTION AND COVER STORY				
Co-acting versus Interacting Manipulation	Subjects were told either that campus opinion uniformly favoured annual chest X-rays (High) or that campus opinion was mixed (low).				
Dependent Variable	↓	Ss asked to read "press release" containing only supportive arguments for having annual chest X-rays (See Appendix A)	Ss asked to read a "press release" which summarized two arguments ("cancer" and "sterility") that have been advanced against having annual chest X-rays and then refutes them. (See Appendix B)	↓	
		Ss asked either to write individual essays (co-acting condition) or to hold group discussions (interacting condition) defending annual chest X-rays.			
		Annual chest X-rays attacked, citing "cancer" and "sterility" arguments. (See Appendix C)	Annual chest X-rays attacked, citing "needed resources" and "better techniques" arguments (See Appendix D)		
	Ss' personal opinion regarding annual chest X-rays obtained as part of a "general health survey" by the Dept. of Health and Social Services. (See Appendix E)				

Psychology course who participated in this experiment as part of the course requirements. A note on the sign-up booklets used by subjects to register for the experiment stated that this was not a psychology experiment but that it was a study conducted by the Manitoba Department of Health and Social Services through the co-operation of the Department of Psychology, University of Manitoba, and that credit would be given for participation. To lessen the possibility of friends serving together, sign-up booklets were put out at various times with the effect that only one person could sign up for a particular session in that booklet.

Within each of the ten team conditions of high and low reassurance over the five levels of defensive treatments there were three groups of five subjects per group. Therefore, within each of the cells there were fifteen subjects who served in only one condition. In the individual condition, there were ten groups of fifteen subjects who worked separately on the task. The male to female ratio in the group composition was generally held to two to three.

## Procedure

### I Co-action Condition

#### A. Defensive Treatments:

The setting for the co-action condition was a large university classroom equipped with tables and chairs to serve as desks. Each of the fifteen subjects was seated in alternate seats in each row throughout the room. After the experimenter had signed the cards

to give each subject credit for participation, she gave them the following instructions:

Hello. I'm Catherine Casserly.

As you may have heard, in January the Senate of the University decided to make annual chest X-rays for TB compulsory for all staff and students. The reason for this was that the Manitoba Department of Health and Social Services felt prevention of communicable diseases was especially important in any organization the size of the University of Manitoba.

However, it is possible that some people will feel upset about this regulation because it does require them to do something they did not have to do before. The provincial government would like to avoid this problem by being able to explain the importance of an annual chest X-ray to everyone's satisfaction. They have asked our help because they know that the psychology department has access to the ideas of many students through the subject pool.

(The Experimenter then introduced the "Reassurance" manipulation by saying one of the following sentences:)

From a campus survey we took in the fall it seems that students are split on the importance of an annual chest X-ray (Low Reassurance)

From a campus survey we took in the fall it seems that everyone is in agreement on the importance of an annual chest X-ray (High reassurance)

What we want to do is develop some kind of program to convince people of the necessity of the X-rays. We'd like to publicize the best arguments put forth by the students themselves in support of the X-rays in a kind of public campaign, although no one will be identified by name. We'll do this just before the annual TB clinic next December.

What we would like you to do is present your arguments on why students should take part in the clinic in essay form. We'd like to play down the compulsory aspect of the X-ray. You will probably have difficulty making up arguments on the spot so to help you along, you can use this press release from the Canadian Association for the Prevention of Communicable Diseases as an outline. The important thing we want to have is to make these points made in terms that students will understand and that is why we are asking students' help now.

Take five minutes to read this paragraph over carefully a few times. Then you have half an hour to work on your essay. Do you have any questions?

Overall, half the co-acting students were given high reassurance and one-half were given low reassurance. All were then given five minutes to read the defensive essay which was presented as a press

release from the Canadian Association for the Prevention of Communicable Diseases, dated Oct. 20, 1969. This is a fictitious organization. The press release contained points to guide the students in their discussion. The supportive group received an essay which emphasized the importance of the chest X-ray because it was the only certain method of detecting TB, a contagious disease which was once the number one killer in Canada before the introduction of the chest X-ray (Appendix A). The essay given to the refutational groups attacked arguments against the use of the X-ray by pointing out the minuteness of the amount of radiation associated with it and stated that it did not cause sterility and defective children as some had claimed (Appendix B).

The subjects then wrote essays on blank paper to support the use of chest X-rays at the University of Manitoba. At the end of approximately one-half hour, the Experimenter terminated the defensive pre-treatment by collecting the essays and presenting the instructions and materials for the attack on the belief. The instructions were as follows:

Time is up. Now I'd like you to look at a statement by Dr. Villeneuve of the University of Alberta. He is one of handful of reputable M.D.'s who have expressed opposition to chest X-rays. It is ideas such as his which might appear in the fall. We are wondering which of his arguments would be most likely to influence you, as a student, not to take an X-ray? You can use the blank sheet to write your answers. Do you have any questions?

Stating that the author of the essay was a Dr. Villeneuve of the Faculty of Medicine, University of Alberta was an attempt to give both pro (the press release) and con (Dr. Villeneuve's statement) arguments the same source of prestige (Tannenbaum, 1967).



The supportive and refutational-same groups received the same massive counterargument essay (Appendix C) which pointed out the dangers of radiation associated with the chest X-ray and the possibility of bone cancer, leukemia and damage to the reproductive tissues. The attack for the refutational-different group (Appendix D) contained novel negative points that the use of the X-ray was a waste of resources for such a rare disease and, in addition, there were newer, safer methods of TB diagnosis. Subjects were given approximately ten minutes to work on this task.

When they had completed this task, they were given the attitude measure in the guise that it was part of a larger, unrelated survey being conducted by the Manitoba Department of Health and Social Services across the province and that these people would be taken as representative of university students. The instructions were as follows:

Thank you all for your help. There is one more thing that I'd like you to do. In addition to its role in promoting annual chest X-rays in the province, the Department of Health and Social Services is responsible for all general health programs throughout Manitoba. They are always interested in getting people's opinions about all the aspects of good health, and they have been using a general survey of health beliefs to do so. This particular survey is being given to several large groups of people in the province to get a representative view and the university population is one of the groups being sampled. So would you please fill in this questionnaire. It will only take a few minutes. Thank you.

The questionnaire which was printed on brown paper was based on ones used by McGuire (eg. McGuire, 1963) but was shortened and modified with other statements on health related topics to support the cover story. The single chest X-ray item was buried in the middle

of this survey (Appendix E). Subjects did not have to sign the questionnaire. They were thanked for their co-operation and dismissed.

In an attempt to have subjects believe that this material came from various sources, three different typewriters were used to make the original copy of the essays. Paper bearing the university letterhead of the University of Alberta was used for the massive counterarguments and inexpensive brown paper was employed for the questionnaire.

#### B. Attack Only No Defence Treatment

Subjects in this condition received the same general introductory remarks as those in the defensive treatment condition except that that the pre-attack manipulation was deleted. They were asked to indicate which of the arguments would influence them not to take the chest X-ray. They were then given the same massive counterarguments as the ones received by the refutational-different group. Again subjects were equally divided between those receiving high and low reassurance of group consensus. After ten minutes of work on this task, they were asked to complete the attitude questionnaire, thanked for their co-operation and dismissed.

#### C. Neither Attack Nor Defence Treatment

Subjects in this group received neither a defensive treatment nor an attack on their beliefs. They served as the control group to measure belief of the cultural truism. They received the same

introductory remarks to the problem as did the other groups including either high or low reassurance but they were asked only to complete the questionnaire.

## II Interaction Condition

In this half of the experiment the same manipulations were employed with the following exceptions. First, the physical setting differed in that the five subjects composing any one team were seated informally around a table in a small experimental laboratory. The experimenter sat off to one side where she could record their dialogue. The introduction was prefaced by the experimenter introducing them to each other on the pretext that she wanted to keep their names straight.

They were presented with the same material for their respective conditions and the same time allotment for their tasks. The attack on the beliefs was exactly the same under both the co-acting and interacting conditions in that the subjects listed the arguments which would influence them. The measure of belief after the attack was also conducted in the same manner.

## RESULTS

All subjects filled in the 'Manitoba Department of Health and Social Services Survey of Health Beliefs' at the end of the experimental session. It contained eight statements on various health beliefs and practises on which the students gave opinions. The crucial fifth item read: "All things considered, getting an annual chest X-ray for detecting TB is a very wise practise." A fifteen point scale was used with the point labeled "1" indicating that the statement was definitely false and "15" that it was definitely true. Subjects were instructed to circle the one number that best indicated their judgement of the truth of that statement. When this scale was administered in a pre-test to a group of university students (N=12) who received no manipulations the mean belief was 12.92 with a mode of 15. As the label "Definitely True" was placed under the last three numbers ('13', '14', '15') on the scale it would appear that the item on chest X-rays was generally accepted as a truism by the pool of subjects from which the other subjects were drawn.

### Arguments Advanced by Subjects in the Defensive Sessions

In general, whether in dialogue or in writing, subjects in the defensive treatments tended to develop the ideas presented in the outline given to them at the beginning of the session which was designed as a press release from the Canadian Association for the Prevention of Communicable Diseases. The most common argument advanced by almost every subject was that the students owed it to

others and to themselves to prevent the spread of a communicable disease. However, the refutational arguments tended to emphasize the "why" of having an X-ray and the supportive arguments tended to emphasize that one should take the X-ray because of its inherent positive value.

#### The Influence of the Massive Counterarguments

Subjects were asked indicate which of the arguments in the attack would appeal to them, as students, not to have a chest X-ray. In general, two of the statements were stated as influencing a subject's decision to be against the X-rays. In the refutational-different group they were swayed by the report that skin tests were less expensive, and that tuberculosis is now primarily a disease of the lower socio-economic class. The supportive and refutational-same groups were influenced chiefly by the danger of damage to their chromosomes and secondly by the possibility of contracting cancer. In the refutational-same group approximately one-fourth of the subjects stated that they would not be influenced by any of Dr. Villeneuve's arguments. This phenomena occurred only rarely in the other three groups who read the counter-attack essays.

#### Overall Results

Figure 1 depicts the mean belief on the truism obtained at the end of the experimental session. Table 3 presents the same information numerically. The data were subjected to a factorial analysis of variance employing a 'fixed factor' model.

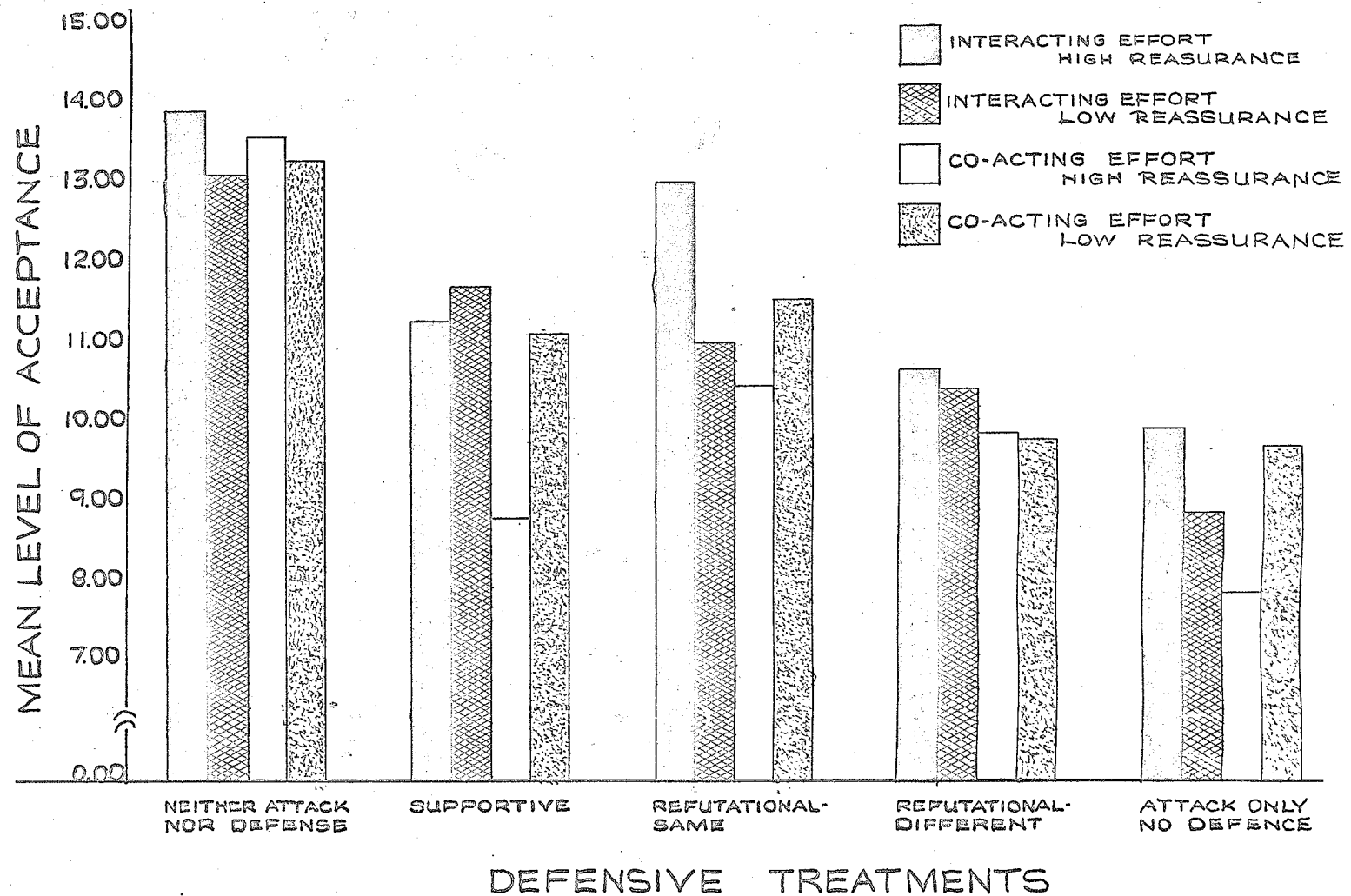


FIGURE 1. MEAN LEVEL ACCEPTANCE OF TRUISM INDICATED ON POST-MEASURE AS AFFECTED BY THE VARIABLES OF CO-OPERATION, REASSURANCE, AND DEFENSIVE TREATMENTS.

TABLE 3. THE MEAN BELIEF LEVEL OF THE TRUISM FOR EACH CONDITION AS INDICATED BY THE POST-MEASURE OF ACCEPTANCE. (N FOR EACH CELL = 15.)

GROUP CONDITION	KIND OF REASSURANCE	NEITHER ATTACK NOR DEFENSE	DEFENSIVE TREATMENT			NO DEFENSE
			SUPPORTIVE	REFUTATION- AL SAME	REFUTATION- AL DIFFER- ENT	
INTERACTION	HIGH	13.93	11.27	13.07	10.67	9.93
	LOW	13.13	11.73	11.07	10.40	8.87
CO-ACTION	HIGH	13.60	8.80	10.47	9.87	7.87
	LOW	13.27	11.13	11.53	9.80	9.67

TABLE 4  
ANALYSIS OF VARIANCE

Source	SS	df	MS	F
Degree of Co-operation (A)	48.80	1	48.80	6.16*
Level of Reassurance (B)	.96	1	.96	0.12
Defensive Pre-treatment (C)	651.79	4	162.95	20.56**
A X B	53.77	1	53.77	6.78*
B X C	38.96	4	9.74	1.23
A X C	17.05	4	4.26	0.54
A X B X C	26.35	4	6.59	0.83
Error	2219.34	$\frac{280}{299}$	7.93	

\*  $p < .05$

\*\*  $p < .01$



Table 4 presents a summary of the 2 X 2 X 5 analysis of variance. A 2 X 2 X 3 analysis of variance was also conducted where the control groups were eliminated in order that the effects of the defensive treatments could be examined more clearly. In addition, one of the postulated effects dealt directly with the three levels of defensive treatments. However, no difference was found between the two analyses.

#### Co-operation on the Defence of a Belief

The mean belief indicated by subjects who had interacted in the defence of a belief was 11.40 while the mean for subjects who co-acted was 10.60. This difference of .80 points is in the predicted direction and is statistically significant ( $p < .05$ ).

#### Levels of Reassurance of a Belief

Groups receiving high reassurance that this truism was accepted had a mean of 10.95 while those who received low reassurance had a mean of 11.06. This small difference cannot be said to reflect a real difference in the effectiveness of the reassurance manipulation.

#### Defensive Treatments

The main effect of the defensive treatment factor was statistically significant ( $p < .01$ ). Inspection of the sample means of the data indicates the differential advantages of the various defences utilized in this experiment. The mean of the control group which received neither an attack nor a defence was 13.48. When the attack was not preceded by any defence, opinions were some 4.40 points

lower. The combined mean for defensive treatments was 10.68. This represents a 36.36% reduction in the effectiveness of the attack. This percentage was obtained by making the same assumptions as those given by Anderson and McGuire regarding the interval properties of the attitude scale and evaluating the conferred resistance to persuasion in proportional terms.

When the three defensive treatments are considered by themselves the mean of 11.53 of the refutational-same group indicated that it reduced the effectiveness of the attack by 55.68%. The refutational-different group had a mean of 10.18 which indicates a 25.23% reduction. The combined refutational means of 10.86 resulted in a difference of 2.62 from the baseline group or a 40.46% reduction in the effectiveness of the attack. This mean is not significantly different from that of the supportive group (10.73). The supportive treatment was 37.50% effective as a method of increasing resistance to persuasion.

T-tests for differences between the means of the defensive treatments (Hays, 1963, p. 318) were conducted and the results are presented in Table 5. As might be expected, the group which received neither an attack nor a defence is significantly different from the remaining four groups. Similarly, all three defensive treatments are significantly different from the control group which received only the attack. Within the three defensive conditions, the only cells which differed significantly were the refutational-same and the refutational-different.

#### Co-operation and Level of Reassurance of a Belief

Table 6 shows the mean scores for the subgroups within each of these two conditions of co-operation on a task and the reassurance of what a reference group thinks regarding that belief. The predicted interaction between these two variables to the effect that high reassurance is debilitating in the co-action condition (Anderson and McGuire's finding) but conducive to developing resistance to persuasion in the interaction condition is significant at the .05 level. Table 7 presents the probability values for these various comparisons.

#### Co-operation and Defensive Treatment of a Belief

There is no overall significant interaction between these two variables.

#### Level of Reassurance of a Belief and the Defensive Treatment

There was no overall significant interaction between these two variables. However, in view of the theory of inoculation one finding is especially important. Within the supportive condition, low reassurance is significantly more effective than is high reassurance in conferring resistance to persuasion ( $p < .01$ ) while the reverse holds for the refutational-same group ( $p < .02$ ).

#### Co-operation, Type of Reassurance and Defensive Treatment of a Belief

There was no overall interaction among these three variables.

TABLE 5

Probability of Obtaining these Differences Between Means

TREATMENTS	Supportive Defence	Refuta- tional-Same Defence	Refuta- tional-Different Defence	Attack-Only No Defence
Neither Defence Nor Attack	$p/_{.002}$	$p/_{.002}$	$p/_{.002}$	$p/_{.002}$
Supportive Defence	---	N.S.	N.S.	$p/_{.01}$
Refuta- tional-Same Defence	---	---	$p/_{.002}$	$p/_{.002}$
Refuta- tional-Different Defence	---	---	---	$p/_{.05}$

**TABLE 6**

**Mean Scores Obtained for the Interaction of Co-operation and Level of Reassurance**

<b>DEGREE OF CO-OPERATION</b>	<b>REASSURANCE TO SUBJECT</b>	
	<b>High</b>	<b>Low</b>
<b>Interaction</b>	<b>11.77</b>	<b>11.04</b>
<b>Co-action</b>	<b>10.12</b>	<b>11.08</b>

TABLE 7

Probability of Obtaining these differences between the Means of the Interaction of Co-operation and Levels of Reassurance Variables.

MEANS	11.08	11.04	10.12
11.77	N.S.	N.S.	p/.01
11.08	---	---	p/.06
11.04	---	---	N.S.

## DISCUSSION

### Co-operation on the Defence of a Belief

The results obtained support the hypothesis that where specific orientation is given to unify members, then individuals in this interacting condition will be more resistant to attempts at persuading them. Because of this, Anderson and McGuire's statement that one of their independent variable was group cohesiveness can be questioned.

Of course, it is possible that with the experimenter present the students' attention was more directed at the task at hand than in the co-acting condition which tended to be less intensely supervised. In the interacting situation the experimenter acted as the recorder of the dialogue and tended to prevent any wandering from the topic. Therefore, this difference may be only a function of that supervision. However, this explanation tends to be weak in that there is no difference between groups in the kind of arguments proposed nor in the quantity. It would seem that other factors were operating to cause the differential effect; the primary one may have been the degree of group cohesiveness.

First of all, in the interacting condition, students' names were announced so that it was easier to identify a person's position on this issue with the person who gave it. Because of this, he would tend to change his stated belief less than he would in the anonymous co-acting condition. Deutsch and Gerard (1955) demonstrated this same effect that the more public one's stand was, the less change was apt to

be obtained on later measures of that belief. The students working in teams were committed to a position of support for the truism, because they had agreed to devise arguments in favour of chest X-rays. They could have felt that proving vulnerable to opposing arguments meant 'loss of face'.

Secondly, the teams had to discuss their problem. In talking it out, it is possible that they became much more aware of what they were doing. If a person strayed from the topic, either another subject or the experimenter redirected him to devising arguments in favour of the chest X-rays. Perhaps more important was the phenomena which occurred whenever a subject gave a negative statement. The students almost always managed to refute it in some way. One striking example happened within one group where one person initially was very opposed to having to take the chest X-ray. However, another member of the team was a public health nurse who appeared to know every relevant statistic regarding tuberculosis and the use of chest X-rays. Employing the group debate as the means of immunization, the group accepted the importance and the necessity of the chest X-ray by the end of the defensive session. This occurred because the nurse refuted every attack by her opposition with definite and accurate facts.

Being in a small group even differentially affected the control groups who were not exposed to any defensive treatments. More unity on an issue seemed to evolve in the small cohesive units than in the larger assemblies. These groups did not have to do any task as a unit and the only difference was the size of the group and the degree of interaction which was induced.



Level of Reassurance of Group Belief

Reassurance was hypothesized to be an important independent variable in the maintenance of a belief. Anderson and McGuire found that low reassurance was more effective overall than was high reassurance ( $p < .06$ ). There was no evidence in our study that the level of reassurance was a factor.

It is possible that such a result is due to the fact that the campus population which was assumed to be the important reference group for university students was not sufficiently relevant to them. For example, if only students in the Arts program had been employed as subjects, they might have been more affected by a supposed survey taken of classes in the Fletcher Argue Theatres. Because the campus is composed of many diverse and often antagonistic elements, the average of such a group may not seem typical of his own particular group norms for an Agriculture, Engineering, or Interior Design students. Such a possibility was not taken into account beforehand because we felt that the identity of a person as a "University of Manitoba student" was more important than that of "Commerce man". On a campus of 15,000 students this did not always appear to be true.

The Defensive Treatment of a Belief

The foundation of the theory of inoculation is that any defence prior to an attack is superior to no pre-treatment at all. The defensive treatments contain, to varying degrees, the two necessary components required in the maintenance of one's belief (McGuire, 1961; McGuire, 1963). First, the subject is motivated to

supply arguments, even if only to satisfy the requests of the experimenter. Secondly, the subject is given points to develop as he wishes. In actively participating in this development, he was given the opportunity to practise without being overcome by opposing forces. It is roughly similar to the training period provided to athletes. Because these two criteria of the theory were fulfilled, the subject should have reacted as he in fact did. The findings in this study support the theory as proposed by McGuire.

Another basic postulate of the theory is that within the defensive treatments, the intrinsically more reassuring supportive defences are less effective in conferring resistance to the subsequent attacks than the intrinsically more threatening refutational defences. McGuire and Papageorgis (1961) and Anderson and McGuire (1964) found that not only was the reassuring supportive defence less effective than the refutational defence but also that it was not effective at all. They concluded that it lacked the necessary threat to a person's belief so that motivation to fight was insufficient. However, the present study found no significant differences between the strength of the supportive defence in reducing the effectiveness of the attack and the combined refutational effect. The theory provides possible explanations for such results. McGuire (1962) has shown that refutational defences showed a delay-action effect in that they produced more resistance against attacks that came several days later than against immediate attacks. Although we cannot evaluate this effect from our study, it is possible that ~~it could be that~~

since the attack in this case was separated from the defensive treatment by a matter of minutes that the more lasting effects of the treatments were not demonstrated and that the order of strength of mean belief as listed in Table 3 would have been somewhat reversed if the attack had occurred after a greater temporal separation. According to McGuire (1962), the mean belief in the supportive condition would have decreased sharply over a period of time while the mean of the refutational defence would have exhibited an immediate increase in effectiveness followed by a much slower decline in strength over time.

An alternative explanation is based on the work of McGuire and Papageorgis (1962) which employed the additional external manipulation of threat. Where subjects were warned before the defences that these defences would be followed by a strong attack on the belief, significantly more resistance to subsequent attacks was conferred than where there were no forewarnings. Also this enhancement of the immunization efficacy of the defences due to the extrinsic threat was greater with supportive than with the refutational defences. They concluded that this interaction was in accord with inoculation theory since refutational defences had an intrinsic threatening element and hence stood to profit less than the supportive from adding the extrinsic threat. In our study, the introductory remarks contained what may be interpreted as an extrinsic threat: students were told that some people would resent mandatory chest X-rays and that the Department of Health and Social Services was trying to convince the

students to take the X-ray' because they want to and not because they have to'. The logical conclusion for a subject to draw was that his belief was going to be attacked, if not now, then at least in the following academic year when the requirement would come into effect. This formed a threat to the truism which up to this point had existed in an ideological monolithic environment and it is possible that it provided the necessary stimulation which resulted in the obtained strength of the supportive condition. It counteracted the usual effect of the supportive defence of making the subject even more confident by alerting him to possible dangers.

These explanations can be generalized also to explain why the hypothesis that refutational-different defence should be the strongest was not confirmed. While the refutational-same defence contained the pre-exposure to the specific arguments later used in the attack, the refutational-different defence depended for its immunizing efficacy solely on the defence-stimulating mention of attacking arguments: the specific refutations it contained were irrelevant to the quite different ones attacked in the later persuasive attacks. Refutational same treatments proved to be the strongest because subjects were presented with a challenge that they had already overcome. And overcoming the familiar obstacles was an easier challenge than overcoming any new obstacles.

The concept of demand characteristics is also a viable explanation for the effectiveness of reducing the strength of the attack. Earlier studies had found that refutational-different treat-

ment was much stronger in its reduction of the effectiveness of the attack than was found in our study. McGuire (1961) demonstrated it as 55.50% capable of resisting attempts at persuasion; Papageorgis and McGuire (1961) demonstrated it to be 51.80% effective; and Anderson and McGuire (1964) at 30%. However, in each of these studies the subject's attention was directed at what was expected of him. In every case there was a pre-measure, a defensive treatment on some of the truisms, followed immediately by the attack and subsequent post-measure. It is possible that subjects had formulated their own hypothesis of the purpose of the experiment and with such a plethora of cues it was relatively easy to be accurate and respond accordingly. In our study, we attempted to have the post-measure be seen as not being related to the task and only one item of the questionnaire was even pertinent to the discussion. This event was intended to appear as purely coincidental. There was no pre-measure and perhaps students were less likely in this case to surmise that they were expected not to change their minds. Because of this, the obtained strength was much less than in the previous studies in this series.

Our original basis for this hypothesis was that if individuals could successfully refute one set of arguments, then they would evaluate any further arguments as weaker than they would have done without this prior experience, even if this subsequent argument was one with which they were unfamiliar. It appears that such a phenomena did not occur. Despite the criticisms we have raised, the results obtained, support inoculation theory that it is easier to maintain one's

belief when faced with arguments one has already refuted than when one is faced with novel arguments.

Reassurance of a Belief and Co-operation in its Defence

The variable of reassurance differentially affected the resistance to persuasion indicated by the interacting and co-acting individuals as was predicted. Low reassurance, as presented in Table 6, resulted in slightly higher means in the co-acting groups than in the co-operating groups and this supports Anderson and McGuire somewhat. Perhaps this is because it provides the extrinsic threat necessary to stimulate motivation to practise one's belief. On the other hand, low reassurance is very detrimental to subjects who are interacting. High reassurance of acceptance by the peer group together with the fact that people in his immediate environment are expressing public support for the truism enable a person to reject the ideas of another who is identified as "one of a handful of reputable M.D.'s who has expressed opposition to the use of X-rays." Some subjects expressed the sentiment that some people are against anything and others that this "Dr. Villeneuve" was not speaking for the Canadian Medical Association. They had received sufficient reinforcement of the accuracy of their belief that they were well immunized against any attacks.

In addition, even if one had already expressed public agreement with the idea, it was easier to change one's mind on the topic when asked for a private opinion and when there was expressed opposition from less immediate but still acceptable sources to the subject.

### Co-operation and the Type of Defensive Treatment

No significant interaction occurred between co-operation and the type of defensive treatment. There were no differences between the control groups who received neither attack nor defence and the two levels of reassurance nor between the control groups who received only the attack and the two levels of reassurance. These results were expected. However, within the supportive condition, the interacting individuals expressed a significantly stronger acceptance of the truism ( $p/.01$ ) than did the co-acting individuals. Within the refutational same conditions, this difference was also significant ( $p/.02$ ). But no other differences were found. It is possible that the reason for these differences was that in the dialogue, especially in the supportive condition, some subjects introduced the idea that the truism could be questioned. When such negative ideas were proposed, other members of the team quickly argued against them. Not only was the necessary threat introduced but the subjects had the opportunity either to refute them or to observe others refuting these attacks. In the co-acting condition, subjects were only aware of what their own arguments were. They were not exposed to any possible conflict. Consequently, they proved more vulnerable when exposed to the massive counterattack because they were much more unfamiliar with the attacking messages.

### Level of Reassurance and Type of Defensive Treatment

It was also hypothesized that high reassurance of the acceptance of a truism by a reference group would tend to increase the effectiveness of the refutational defences and decrease the effect-

iveness of the supportive treatment. Low reassurance was postulated to have an inverse effect. The overall interaction was not found to be statistically significant. Furthermore, the findings showed that within the combined refutational treatment, there was little difference whether a subject was told that his peers agreed or disagreed with this concept of the truism. The treatment given him motivated him to practise his refutations and provided the necessary tools to do so. However, in the supportive condition, low reassurance was much more effective than high reassurance in conferring resistance to persuasion. The mean belief indicated for high reassurance groups was 10.03 while for low reassurance it was 11.43 and this difference is statistically significant ( $p < .01$ ). This replicated the earlier findings by Anderson and McGuire (1964). It appears that the low reassurance in the supportive condition operated as an extrinsic threat to the belief and paralleled the intrinsic threat contained in the refutational arguments, both of which had as their aim the motivation of the subjects to defend the truism. The high reassurance, on the other hand, had a detrimental effect in the former condition of making the already overconfident believer even less motivated to devise any defences. Because this was one of the necessary elements for inoculation, immunization did not occur.

#### Co-operation, Level of Reassurance and Defensive Treatments

Because of the lack of a significant interaction, the hypothesis concerned with the combination of these three factors were rejected.



### CONCLUSIONS

To the extent that McGuire himself has limited this theory he has developed a heuristic model of why one may be resistant to an attack on one's basic beliefs. We have demonstrated again that any defence prior to an attack is better than no defence at all. In addition, it is more effective to challenge a belief - to make an individual realize that even his most fundamental assumptions can be questioned - than it is to merely support him.

Yet the theory has restricted itself, by its use of cultural truisms, to a limited application outside the laboratory. This has its advantages in that many fundamental religious and political beliefs have never been analyzed by their adherents. If the individual questions the old order and has never been given the material to satisfy these doubts, then he is likely to be extremely susceptible to any persuasive influences. McGuire's model does explain how such persuasiveness is effective and how to reduce its strength.

However, we criticized certain expansions of this theory - especially those proposed by Anderson that what constitutes support for a belief may, in fact, not be reassurance. Our findings provide evidence that his definition may not have been correct. The subject does not leave his reference group at home when he takes part in the experiment, especially when he has to decide what is right and true.

Our results might have differed if we had used a more

immediate reference group such as a club to which the subjects belonged but we theorize that the effect would have been to make the differences between highly and lowly reassured groups even more significantly different. Furthermore, the variable of reassurance could have been made more dramatic. This does not mean that it should have been as obvious as that used by Anderson and McGuire but only that subject should be aware of what the supposed general feeling on an issue was.

An interesting expansion of our study would be to have the attack on the belief occur after various intervals of time after the defensive treatment had been given. These intervals might be immediately as in our study, one hour, one day and seven days. Support might have been found for the phenomena which McGuire (1964) has identified as the "paper tiger" effect. In such an extended design the supportive defence probably would not have the strength that we found in our study.

In summary, this experiment fulfilled our purpose of emphasizing that man is a social animal. Factors which influence his nature cannot be ignored in research. Experimenters who become over specific for the purpose of identifying one factor run the risk of ignoring others which are operating in the situation whether or not they have been recognized. One of the most neglected variables is how people operate when they are not pressured to perform by the artificiality of the laboratory setting. People talk to each other. People act according to how the important others in their world indicate that they should act. They exchange ideas. Rarely do they write why they support their beliefs. And they do not sit around underlining essays. A theory

which deals with groups of people, no matter how excellent, cannot be applied to ordinary circumstances unless it takes these factors into consideration. The purpose of our experiment was to do just that - to apply McGuire's Theory of Inoculation beyond the limits which had been imposed upon it by the nature of the experimental paradigm used thus far to find support for it. In including the social environment of man as an independent variable, the Theory of Inoculation as a means to develop resistance to persuasion has been refined and improved.

APPENDICES

APPENDIX A

(Press release: The Canadian Association for the Prevention of Communicable Diseases: Oct. 20, 1969)

THE IMPORTANCE OF AN ANNUAL EXAM FOR DETECTING TB

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 number one 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 Canadian 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.

Points to Discuss:

1. The chest X-ray is the only sure way of detecting TB.
2. TB is a contagious disease.
3. The chest X-ray detects the disease in its earliest stages.
4. Because of the chest X-ray, TB is no longer the number one killer in Canada that it once was.

APPENDIX B

(Press Release: The Canadian Association for the Prevention of  
Communicable Diseases: Oct. 20, 1969)

THE FALSE CHARGES AGAINST CHEST X-RAY EXAMINATIONS FOR TB

After centuries of brilliant and painstaking research by some of the world's finest scientists, we are finally in a position to control TB (tuberculosis), a disease which has plagued humanity since Biblical times. The major weapon in this successful fight against TB has been the widespread adoption of the practice of getting an annual chest X-ray as a means of detecting TB symptoms in their earliest stages. Unfortunately, there have been occasional articles in the press which argue that we should not take annual chest X-ray examinations for the detection of TB. Since it is so vital that the progress which we have made (TB was Canada's number one killer before X-rays became available) should not be undone, we should review some of these misleading and distorted arguments. It has been occasionally claimed, for example, that chest X-rays cause cancer. An equally misleading claim is that such X-ray examinations can cause sterility and defective children. By seeing the flaws in these arguments we can recognize why the practice of getting an annual chest X-ray examination is so important in the fight to keep TB under control.

Points to Discuss:

1. It is said that chest X-rays can cause cancer due to radiation but the amount of radiation from an X-ray is the same as that from wearing a wrist watch with a luminous dial.
2. It is said that an X-ray can cause sterility and defective children. However, the amount of radiation is insignificant and practically no radiation reaches the reproductive tissues during the chest X-ray examination.



APPENDIX C



SOME HARMFUL EFFECTS OF CHEST X-RAYS

Statement Issued by: Dr. Joseph Villeneuve, M.D.  
Faculty of Medicine

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.

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 tumours 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 then 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-rays 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, 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.

APPENDIX D



THE UNIVERSITY OF ALBERTA  
EDMONTON 7, CANADA

### SOME HARMFUL EFFECTS OF CHEST X-RAYS

Statement Issued by: Dr. Joseph Villeneuve, M.D.  
Faculty of Medicine

Medical associations and public health authorities have recently begun to question the wisdom of repeated X-ray examinations for detecting TB (Tuberculosis). Exposure to radiation - even the small amount encountered in the X-ray examination - has come to be recognized as a health risk which is no longer necessary as far as TB is concerned. Today, TB is so rare in this

general population that such "shotgun" techniques as universal as chest X-rays are extremely wasteful of needed resources. Furthermore, the chest X-ray has been largely outmoded by newer and safer methods of TB diagnosis. Let us examine in more detail some of the evidence that has led public health officials to advise against the continuation of these campaigns to get everyone to have repeated chest X-rays;

It is particularly unwise to urge that everyone expose himself to the radiation dangers involved in having chest X-ray examinations each year, in view of the fact that TB has become a relatively rare disease in this country, confined chiefly to specific and predictable subgroups of the populations. Today, TB occurs with frequency only in underdeveloped countries. In Canada only underprivileged groups with an inadequate diet show any considerable frequency of TB. The resources now devoted to expensive campaigns to give X-rays for TB to all Canadians each year is considerable. These campaigns to check-up on a disease that has actually become quite rare in the general population are costly, not only in money but in the time of skilled medical personnel. The fight against TB could be carried out much better by devoting these resources, now largely wasted, to a concentrated task on the disease in the underprivileged groups in our society.

Another reason for discontinuing these general X-ray campaigns is that several new tests for TB are now in existence, the best known of which is the skin test. This is a simple, safe and inexpensive substitute for the X-ray examination. Many of the foremost centers for TB diagnosis are now relying primarily on these skin tests, thus avoiding the unnecessary exposure of their patients to dangerous dosages of radiation from chest X-rays. Not only is the skin test safer and cheaper than the chest X-ray, but also it is a surer means of detecting TB. Detecting TB symptoms in chest X-ray photographs still involves an element of subjective judgment. While trained physicians are highly accurate in this detection, the possibility of missing faint symptoms always remains. The skin test has eliminated this possibility of having an error reduced the detection of any TB signs, however faint, to a certainty. These considerations indicate why health authorities are now recommending that the practice of getting annual chest X-ray examinations for detecting TB to be discontinued.

**APPENDIX E**

MANITOBA DEPARTMENT OF HEALTH AND SOCIAL SERVICES

SURVEY OF HEALTH BELIEFS

The Department of Health and Social Services is interested in determining the extent to which you agree with the following statements. Hence, we ask 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 answer the question in the order presented and do not skip any question.

1. Everyone should have regular 'booster' vaccinations.  

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
Definitely False	Probably False			Uncertain			Probably True			Definitely True				
2. Soap and water are the most efficient means of cleaning wounds.  

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
Definitely False	Probably False			Uncertain			Probably True			Definitely True				
3. Smoking tobacco leads to cancer.  

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
Definitely False	Probably False			Uncertain			Probably True			Definitely True				
4. People should be urged to have a complete medical checkup regularly.  

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
Definitely False	Probably False			Uncertain			Probably True			Definitely True				
5. All things considered, getting an annual chest X-ray for detecting TB is a very wise practice.  

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
Definitely False	Probably False			Uncertain			Probably True			Definitely True				
6. Brushing one's teeth is essential to good dental health.  

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
Definitely False	Probably False			Uncertain			Probably True			Definitely True				
7. Your diet should be based on Canada's Food Rules for good health.  

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

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