THE EFFECTIVENESS OF INTERPOSING TIME INTERVALS BETWEEN MESSAGE SEGMENTS AS A MEANS OF INCREASING ATTITUDE CHANGE AMONG HIGHLY EGO INVOLVED SUBJECTS

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ABSTRACT

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Mass media have often been found to be relatively ineffective as channels for communicating large changes in attitude, particularly highly ego involving attitudes. Sherif and others have found that messages highly discrepant from the receiver's own position may cause an opinion change in the opposite direction from that advocated (the so called, "boomerang" effect), especially when the perceived source of the message is weak, and the receiver is highly ego involved in the content.

A possible strategy for overcoming this problem is suggested by Social Judgment Theory. The perceived discrepancy of the message could be made less by dividing it into increments of increasing discrepancy from the receiver's position, and delivering it with time intervals between the increments, such that persuasion is accomplished by several small steps rather than in one large step.

In this study, one group of previously pro-marijuana-smoking university students is given an anti-marijuana-smoking message at one time, another group is given the identical message divided into four segments and presented

with one week intervals between segments. The segments are so designed as to represent increasingly more discrepant attitude positions.

It is hypothesized that there will be more attitude change in the group receiving the message at one week intervals, for highly ego involved students. The criterion measure is an estimate by the students of their marijuana smoking over the following four weeks. The results support the main hypothesis for the highly ego involved students. Other attitudes about marijuana did not differ significantly between groups.

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Dedicated to Sharon

in appreciation for her love,

encouragement and patience.

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TABLE OF CONTENTS

Chapter		Page
I	RATIONALE	1
	Introduction	1
	"Attitude" Defined	2
	The "Boomerang" Phenomenon Described	4
	Social Judgment Theory	5
	Ego Involvement	7
	Discrepancy	12
	Time	18
	Cognitive Dissonance Theory	19
	Personality	28
	Summary of Hypotheses	29
II	METHODOLOGY	31
	Selecting an Issue	31
	Messages	33
	Time	36
	Subjects	38
	Measuring Instruments	41
	Research Design	44
	Statistical Testing	48
III	FINDINGS	50
	The Pilot Study	50
	Main Study	52
	Latitude of Rejection of Four or More	53
	Latitude of Rejection of Five or More	58
	Latitude of Rejection of Six or More	61
	Summary of Results	64

Chapter Page

IV CONCLUSIONS AND RECOMMENDATIONS 67

The Findings and Social Judgment Theory . 72
The Findings and Cognitive Dissonance Theory 73
Personality Factors 74
Future Research 76
Practical Applications 79
Conclusion Summary 81

APPENDICES 82

A. Pilot Study Pre- and Post-tests . . . 82
B. Pilot Study Messages 86
C. Introductory Letters to Faculty Members and Students 90
D. Main Study Pre-test 94
E. Main Study Messages 96
F. Main Study Post-test 104

BIBLIOGRAPHY 107

LIST OF TABLES

Table		Page
1.	Pilot Study Time Plan	37
2.	Main Study Time Plan	37
3.	Pilot Study Before-to-After Change	51
4.	Pilot Study Differences Between Mean Scores	52
5.	Percentage of Respondents with Changes in Before-to-After Scores When Before Latitude of Rejection Equals Four or More	54
6.	Means of Semantic Differential Scales When Before Latitude of Rejection Equals Four or More	56
7.	Estimates of Future Smoking When the Before Latitude of Rejection Equals Four or More	57
8.	Percentage of Respondents with Changes in Before-to-After Scores When Before Latitude of Rejection Equals Five or More	59
9.	Means of Semantic Differential Scales When Before Latitude of Rejection Equls Five or More	61
10.	Estimates of Future Smoking When the Before Latitude of Rejection Equals Five or More	62
11.	Percentage of Respondents with Changes in Before-to-After Scores When Before Latitude of Rejection Equals Six or More	63
12.	Means of Semantic Differential Scales When Before Latitude of Rejection Equals Six or More	64
13.	Estimates of Future Smoking When the Before Latitude of Rejection Equals Six or More	65

LIST OF FIGURES

Figure Page

1. Theoretical Graph of the Effect of Increased Discrepancy Upon Attitude Change 15

CHAPTER I

RATIONALE

Introduction

This researcher is especially interested in the problem of communicating information which would change strongly held, ego involving attitudes by means of mass communication. This problem has practical implications because many of the most serious problems facing our world (a prime example is population control) require that deeply held attitudes be changed. In many of these cases mass communication systems offer the promise of sufficient speed and economy to make such a campaign practical, however, they have not been found sufficiently effective in the ways they have been usually used in the past.

Mass communication has been found to be less effective than interpersonal communication as a channel for changing strongly held, ego involving attitudes. It has, in fact, been found that the most likely outcome of much mass media exposure is that people become more confirmed in their previous opinions (Klapper, 1960, DeFleur, 1970; Schramm, 1973).

The reasons for this are no doubt complex, but one possible partial explanation comes from social judgment theory and suggests if too large an attitude change is

advocated, especially by a low credibility source, the result will be no change, or even a change in the opposite direction. A strategy derived from the theory, that of changing attitude in small degrees over time (Keisler, Collins and Miller, 1969), will be explored and tested in this study.

In the present study students who have been selected for high ego involvement in the issue of marijuana smoking have been randomly assigned to two treatment groups. One group receives a four-part message and immediately an opinion questionnaire. The second group receives each of the four parts of the message at one week intervals and an opinion questionnaire immediately after receiving the last of the series of message parts. The four parts of the message are so arranged that each part in sequence advocates an increasingly strong position against the smoking of marijuana. The hypothesis predicts that the group receiving the message at one week intervals will experience more attitude change than the group receiving the message as a unit.

"Attitude" Definded

The term "attitude" as used in this dissertation, will be defined as defined by Allport (1935), "A mental and neural state of readiness to respond, organized through experience and exerting a directive and/or dynamic influence on behavior." Although the terms "belief" and "opinion" are often used almost interchangeably with "attitude," they seem

to carry more of the sense of the perceived reality of something that cannot be immediately tested, but not necessarily a predisposition to act in a certain way toward or because of that reality. Since this dissertation is more concerned with the predisposition to respond in certain ways, the term "attitude" seems more appropriate to describe the changes that are anticipated, and especially the change in the main criterion measure, an estimate in the future behavior by the respondents.

A problem of any attitude change research is that "neural states" cannot be directly measured, and must therefore be inferred from measurable behaviors. A "readiness to respond" in a certain manner could most strongly be inferred from an actual response in that manner. However, in many cases, including this study, measurement of the actual response (marijuana smoking over a period of time) is methodologically difficult, and thus verbal reports or estimates of the subject's "readiness to respond" are accepted as giving some indication of the actual attitude.

A problem of this methodology is that it may be easier to change a person's statements about expected future behavior than the behavior itself. The correlation between attitude statements and behavior may not be strong. This seems especially likely to be a problem in a situation where the receiver of the message would perceive a certain attitude statement as being more desirable to the source,

especially where the source is an authority figure. Thus the "attitude" statement given may be more an expression of conformity to the perceived desire or expectation of the source than a realistic projection of future behavior.

This problem might be minimized by designing the study in such a way that (1) the subjects are not led to believe that any attitude position is more acceptable to the researcher than another, and (2) that the researcher will not know who gave what answers. Both of these methods are used in the present study.

The "Boomerang" Phenomenon Described

Communication scientists have usually found that the more attitude change asked for, the more received (Anderson and Hovland, 1957). That is, the greater the discrepancy of the message from the receiver's personal position, the more his attitude will change. However, in certain extreme cases instead of change in the direction advocated the change will actually occur in the opposite direction. The conditions under which this "boomerang" effect occurs are as follows:

1. An extreme attitude change must be advocated.
2. The perceived source of the message must be weak. With highly credible sources the boomerang effect will not occur over a much wider discrepancy range (Goldsmith, 1963; Bochner and Insko, 1966).
3. The receiver must be strongly "ego involved"

in his position (this concept will be explored in more depth later in this dissertation).

4. Some explanations insist that the personality of the subjects is an important variable (see page 22).

That the "boomerang" phenomenon occurs seems well supported by data, but there is some disagreement as to the exact conditions and causes. The present study will explore in more detail these conditions under which the effect occurs considering several theoretic explanations, but primarily will test a strategy for overcoming its effect. That strategy will be derived by using social judgment theory as a base.

Social Judgment Theory

The ideas that underlie social judgment theory can perhaps most easily be explained by referring to the psychophysical experiments from which they were derived. A subject would be given a group of small objects, identical in every way except for weight. He would be instructed to sort them according to weight. It was observed that when no other standard was given the subjects would use the heaviest and lightest weights as standards, and those weights closest to the scale ends would be classified with less error than those in the middle. If, however, a standard were given which fell in the middle of the scale, and the subjects were

instructed to compare the other weights to this standard as they ranked them, accuracy improved in the center of the scale, but became poorer at the scale ends (Sherif and Hovland, 1961).

It also was noticed that there was a systematic pattern to the errors of judgment. For weights close to the standard (or close to the scale ends if no other standard were given) the error was in the direction of judging them to be closer to the standard than they actually were (called "assimilation"), and for weights distant from the standard the error was in the opposite direction, that is, the weights were judged to be more different from the standard than they actually were (called "contrast").

It was further found that the subject's past experience had an effect on his judgment of the weights. That is, a watchmaker would tend to judge the same weights to be heavier than would a weight lifter, especially in the absence of another standard by which to judge the weights. The standards used in judging the weights are called "anchors" and past experience of the individual is called his "internal anchor."

Sherif and Hovland (1961) demonstrated that this judgment process works essentially the same way for psychological judgments. If a subject is asked to categorize a series of attitude statements on some subject into a number of categories along some evaluative dimension (good to bad, etc.)

the person's past experience will serve as an "anchor" or standard by which the items are judged. Items close to the person's own position will be judged to be even closer than they really are, while those farther away will be judged to be still farther.

That part of the attitude scale which would be close enough to the subject's own attitude to be assimilated (seen closer than it really is) Sherif and Hovland called the "latitude of acceptance." That part of the scale which would be contrasted to the subject's own attitude, and thus seen as being farther away than it really is they called the "latitude of rejection"; and any parts of the attitude scale not included in either the latitude of acceptance or the latitude of rejection they called the "latitude of indifference."

Ego Involvement

The perceptual distortion effects of assimilation and contrast are made stronger in proportion to the subject's "involvement" in the issue. It is perhaps this concept which is the most troublesome to the theory. Sherif and Hovland operationalized involvement as membership in a group with a known and usually extreme stand on the issue being studied. For example, in the prohibition study (Hovland, Harvy and Sherif, 1957) the "dry" side was represented by members of the Women's Christian Temperance Union (WCTU), the Salvation Army, and strict denominational colleges; the wets were

represented by a group of personal acquaintances of the experimenters, and the moderates were a group of other college students.

Because subjects were not randomly assigned to treatment groups it cannot be unequivocally stated that any differences found between groups following exposure to a persuasive communication are a result of that communication and not simply reflections of other differences in the groups. Such differences might be in age, education, intelligence and personality factors such as dogmatism.

In spite of these problems this methodology has been defended as necessary in order to obtain the degree of involvement necessary to demonstrate the "bommerang" effect. Indeed, efforts since to get a "bomerang" by experimentally manipulating involvement have met with limited and mixed success.

Involvement, to Sherif, seems to include several factors: the intensity with which an attitude is held, how strongly it is seen as being identified with the self or ego, how strongly it is tied to a reference group or person, and how certain the belief is. In Sherif and Hovland (1961) the authors define involvement as being related to an attitude that is strongly rooted in a reference group, "to a person or group to whom the individual is committed." Later Sherif emphasizes the self identity aspect of involving attitudes. The involved person:

> Does not phrase his judgments as statements about the abstract attributes of the object. He phrases them with personal pronouns: "I think . . . ," "My opinion . . ." . . . when pressed for reasons, he frames them in personal terms; "I am a member of X family," "As a Negro, I feel . . ."; "I am a Baptist" . . . (Sherif, Sherif and Nebergall, 1965).

Another problem with the concept of involvement is that it is related to extremity of attitude (Suchman, 1950). In the studies by Sherif all of the groups representing highly involved positions are also extreme. Thus extremity of attitude may be confounding the findings.

The concept of commitment to a position (a possible component of involvement) can also be troublesome. Although Sherif sees commitment as a part of involvement, it is possible to imagine a person who is committed to a stand without deep involvement in it. For example, a political candidate who has a formal commitment to the platform of his party may in fact have personal reservations about some aspects of it.

Still another aspect of "involvement" that Sherif does not make sufficiently clear is what the involvement is with. Although from the context it seems certain that he meant primarily involvement with the issues under consideration, this could also be confused with involvement with the communicator, with a reference group, or with the response to the communication.

Zimbardo (1960) experimentally manipulated involvement by telling subjects that their attitudes either did or did not (depending on treatment group) provide a "good indication of their basic social values, their personalities and their outlook on life problems." More attitude change occurred in the high involvement group, contrary to the social judgment theory prediction. However, as Zimbardo pointed out, the involvement was with the response (a heightened desire to be judged as having desirable personality characteristics, etc.) rather than with the issue itself.

Several other experiments which purportedly manipulated involvement did so by manipulating some aspect of involvement other than involvement in the issue. For example, Miller and Levy (1967) examined emotional arousal as a component of involvement. They insulted obese women about their obesity, and found that those insulted were more vulnerable to persuasion on another subject. Thus, if involvement is defined as it was in this study, as emotional arousal not related to the subject matter, the opposite of Sherif's predictions are found.

To make the matter of involvement still more complicated there is some evidence that the effect of involvement on attitude change is curvilinear, with both the highest and lowest levels of involvement curtailing change and only middle levels promoting it.

> If only small degrees of change (in involvement) are provided though manipulation,

> we may primarily be seeing the effects of heightened interest and of increased attention to the communication and these may produce greater opinion change. Only when powerful modifications are made will the predicted resistance to change and "boomerang" effects become apparent (Sherif and Hovland, 1961, p. 197).

In a group of studies (Miller, 1965; Freedman, 1964; Greenwald, 1966) subjects were induced to feel that their initial position was more important. In each case, as predicted by Social Judgment Theory, the subjects became more resistant to change. These studies are hard to interpret, however, because as Keisler, Collins and Miller (1969) point out, if involvement is curvilinear as Sherif and Hovland hypothesize, we do not know where on the curve each of these groups started, so do not know whether to predict heightened or lessened vulnerability to persuasion.

Thus what is meant by Sherif by "involvement" seems to be multi-faceted and somewhat ambiguous as far as a conceptual definition is concerned, and methodologically unsound as far as the operationalization is concerned. The usefulness of the theory is severely limited by these problems. In this study the term "involvement" will be used to refer to the relationship a person sees between his own self concept (including any group memberships that may influence his self concept) and some other issue. Ego involvement would be related to an issue's perceived importance and how directly it relates to the person's self concept. It would not

refer to a general state of arousal, although in some cases it might contribute to such a state, and thus arousal might be an intervening variable between involvement and certain other effects, such as attention and learning.

Although the relationship to a conceptual definition is not as clear as one might wish, Social Judgment Theory gives us a convenient way to identify those with a high level of ego involvement. Highly involved people reject a larger number of attitude positions as being unacceptable to them, so involved subjects can be operationally defined as those who have latitudes of rejection of more than a certain number. This operationalization will be utilized in the present study.

Discrepancy:

Another important and somewhat troublesome concept of social judgment theory is the discrepancy between the subject's own attitude and the position of the persuasive message. In social judgment theory discrepancy interacts with involvement as a predictor of attitude change (there are, of course, other factors which also effect attitude change). It is the nature of that interaction which is at the heart of the theory.

Discrepancy is related to certain changes in perception. The more discrepant communication is perceived as less fair, less informed, less logical, less grammatical, less interesting, etc. (McGuire, 1969). Prejudiced people were found to

so grossly misinterpret highly discrepant material as to see it as supportive of their positions (Allport and Postman, 1947; Cooper and Dinerman, 1951; Cooper and Jahoda, 1947; Hastorf and Cantril, 1954; Kendall and Wolf, 1949).

The assimilation and contrast effects of discrepancy which have already been outlined in this paper, were initially observed by Hovland and Sherif in the context of their evaluation of Thurstone's (1929) measurement scale of equal appearing intervals. It was noticed that subjects judged the items when sorting attitude statements in such a way that statements which were close to their own attitudes were judged by them as being even closer than they were, while statements discrepant from their own attitude were judged to be even more discrepant. They found the effect to be strongest for highly involved judges.

They reasoned that this perceptual distortion would cause differences in attitude change as a function of discrepancy and involvement. Specifically they predicted the following, as summarized by Kiesler, Collins and Miller (1969):

1. When persuasive attempts fall within his latitude of acceptance, an individual's opinion changes.

2. When they fall within his latitude of rejection he does not change his opinion. Indeed, Sherif and Hovland contend that communications falling within this region are likely to 'reinforce the respondent's initial stand' or perhaps even produce boomerang effects.

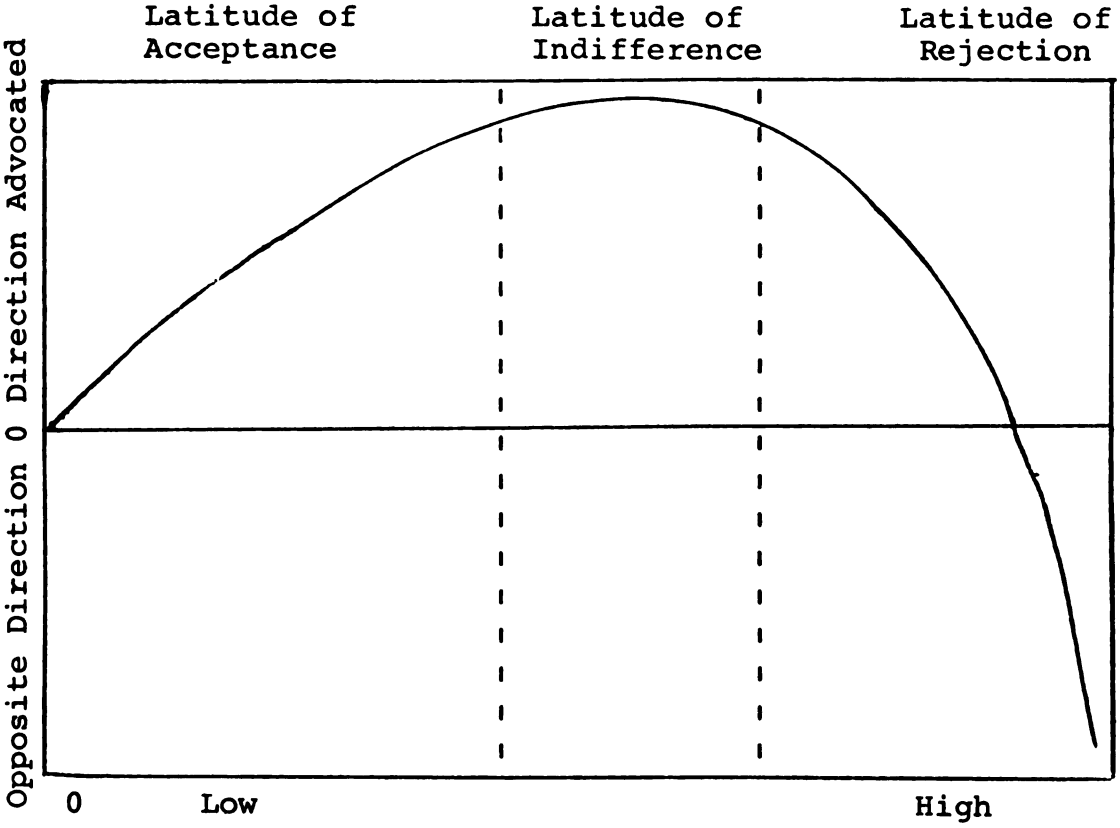
3. As discrepancy between the respondent's own stand and the position advocated by the communication increases, there will be greater opinion change provided that the advocated stand does not fall within the latitude of rejection.

4. For communications which advocate positions within the latitude of rejection, increased discrepancy produces less opinion change. Thus some point presumably close to the boundary between the latitude of noncommitment and the latitude of rejection defines the inflection point in the curvilinear function relating discrepancy to opinion change.

Thus they predict that opinion change is a nonmonotonic function of discrepancy, the greater the discrepancy the more the opinion change to a certain point (close to the latitude of rejection) and beyond that point the greater the discrepancy the less the opinion change, even to the extent of opinion change in the opposite direction to that advocated (see Figure 1, page 15).

The theory does not specify the mechanism by which this non-monotonic relationship occurs, but it could be that the more highly involved respondent will see the message as closer to his own position (due to assimilation) and thus will feel less pressure for change than will the less involved respondent, who will assimilate the message less thus see the message at more nearly the actual distance from his own position. This view would agree well with empirical findings.

However, when this idea is expanded to the latitude of rejection, it becomes less clear. Extending the above



Note that attitude change increases with discrepancy through the latitude of acceptance, begins to level off in the latitude of indifference and declines within the latitude of rejection.

While data support the general shape of the curve shown, the inflection points and sharpness of the curve are by no means firmly established, and would be expected to vary with many factors including source credibility and personality factors.

Figure 1. Theoretical Graph of the Effect of Increased Discrepancy Upon Attitude Change.

analysis leads to the conclusions that for very discrepant messages there would be more perceived difference and thus more pressure for change in the case of the highly involved respondent. However, both the predictions of Sherif and empirical evidence show the opposite. One possible explanation (Kiesler, Collins and Miller, 1969) would be that for the highly involved subject there may be more residual motivation to differentiate himself from an unacceptable communication which still remains after the judgmental distortions. Since not all of the "necessary" differentiation can be achieved by contrasting the communication, shifting his own position away from the communicator remains the only alternative.

Actual research has found that up to fairly extreme discrepancies, the amount of attitude change obtained is a "negatively accelerated, increasing function of the discrepancy between the receiver's and the message's positions" (McGuire, 1969).

There is also considerable evidence that when the discrepancy becomes quite extreme the downturn of the curve predicted by the theory does set in, particularly with unambiguous issues and low credibility sources (Fisher and Lubin, 1958; Hovland, Harvy and Sherif, 1957; Whittaker, 1963; Insko, Murashima and Saiyadain, 1966; Aronson, Turner and Carlsmith, 1963).

Sherif seems to imply a causative relationship between the perceptual error caused by discrepancy and the effect on attitude change, while at least some later writers prefer a more "hydraulic" approach. This is explained well by McGuire (1969):

> It is useful, here again, to conceive of the recipient of the persuasive message as an 'honest broker,' besieged by conflicting claims and needs, who is trying for a 'least-squares solution' to the various pulls being exerted on him. When confronted with a large discrepancy it seems likely that he will respond with a little attitude change, a little source derogation, a little perception distortion, etc., stressing on any given occasion the use of one or another of these modes as his own proclivities and situational conditions allow (Brock and Buss, 1962; Steiner and Johnson, 1964; Steiner and Rogers, 1963).

In spite of such interpretational difficulties, however, two summaries of the literature find considerable support for the theory. Shaw and Costanzo (1970) found that, "The experimental studies that have been conducted as direct tests of the theory have generally provided supportive evidence." Kiesler, Collins and Miller, (1969) state, "The data on attitude change do seem to largely support the predictions of the theory." They do, however, go on to point out that this does not prove the theory correct because, ". . . to date there are no data which unequivocably show that the theoretically specified judgment process does account for the observed attitude change effects."

In the present study both treatment groups will be exposed to the same four-part message which is designed to be

highly discrepant. The first group will receive the message all at one time, the second group will receive each of the four segments separately, with one week intervals between successive segments. The segments are designed to be less discrepant at first, then become increasingly discrepant. The theory predicts that there should be less attitude change for the first group, or even a negative attitude change for highly involved subjects.

The second group should experience more attitude change as compared to the first group because the first message segment will fall into the subject's latitude of acceptance or indifference, thus causing a larger opinion change, which will in turn broaden the latitude of acceptance and narrow the latitude of rejection through each successive message segment making the final message segment less discrepant. Presumably in the first treatment there will not be time enough for this shift to occur, since the messages are read in sequence with no time interval between.

Time

No basis was found in the literature for predicting the amount of time needed for the attitude change to occur and stabilize so that the subject would accept the new attitude as his own. It would seem logical to suppose that with high credibility sources and messages within the latitude of acceptance the new attitude might be accepted almost immediately, but for a message from a less credible source and

especially for a more discrepant message more time would be needed.

Cognitive Dissonance Theory

This theory, developed by Leon Festinger (1957) has motivated a great deal of research since it was introduced. It does not seem necessary to the purpose of this dissertation to discuss the many aspects of the theory fully, but rather to introduce the basic concepts briefly, than to discuss the ways that cognitive dissonance theory relates to the present study.

The underlying assumption of cognitive dissonance is that human beings cannot tolerate inconsistency. Whenever inconsistency exists in a person he will try to eliminate or reduce it (Zimbardo and Ebbesen, 1970). If a person is aware of two cognitions that are inconsistent with each other, to the extent that these cognitions are important to the person there will be pressure to eliminate the inconsistency. Two cognitions are said to be in "dissonance" when one would not follow from the other. For example, a person who knows that he cannot handle alcohol, but is drinking at a party. These two cognitive elements would be dissonant, and we could expect the person to feel some discomfort until he reduces the dissonance. Just as there are a variety of situations that would be expected to cause dissonance, there are a variety of means to reduce it.

The cognitive elements which can be in dissonance are bits of knowledge, attitudes, or beliefs. In order for dissonance to occur, at least one cognitive element must be about the person involved. Other cognitions may concern the outside world. Since the person has found it generally useful if his inner "map" of the world corresponds closely to what his senses reveal to him, he experiences psychological pressure and discomfort when he becomes aware of an inconsistency. This might happen when new information comes to the person (a family preparing for a picnic senses that it has begun to rain), or a decision must be made or opinion formed, making salient dissonant cognitions which before had not seemed important (a person might consider himself a Republican but prefer the stand of a particular Democratic candidate), (Festinger, 1957).

The magnitude of the dissonance felt by the individual is a function of three variables. The first of these is importance. Even though a person may see his behavior as inconsistent with his beliefs, he will not feel much dissonance if the beliefs are not important to him. It is interesting to note the similarity between Sherif's "ego involvement" and Festinger's "importance." For dissonance to exist, at least one of the cognitions must be about the person involved, and importance is defined somewhat vaguely, as perceived by the subject.

The second variable controlling magnitude of dissance is the ratio of dissonant to consonant elements. In many situations (perhaps most) there would be many cognitions relating to a situation, some consonant, others dissonant. The presence of consonant cognitions reduces the dissonance, the greater the number and strength of consonant elements, the less the dissonance.

A third variable is cognitive overlap. An example given by Zimbardo and Ebbesen (1970) illustrates:

> For example, in a choice between a Volkswagen and a Ford Mustang, the two cars have more features in common than a new car and a sailboat. That is, there are more cognitive elements functionally similar between two alternatives when they share comparable features. There is less dissonance when one chooses either of the cars than when one chooses the car over the boat, since in the latter decision, many functions served by the boat are not shared by the automobile. Thus the magnitude of dissonance aroused by the decision between alternatives is inversely related to their cognitive overlap (i.e., it is greater the less they have in common).

Once dissonance is aroused, there will be need to reduce it. This need, according to Festinger, is both motivating and directive. It is a drive state similar to hunger and the other drive states, and causes psychological discomfort until it is reduced. There are three classes of possible means for dissonance reduction:

1. Changing a behavioral cognitive element. If the dissonance is between some element of the person's behavior and some environmental element, he can change his behavior

and thus reduce dissonance. The cognitions, "We are going on a picnic," "It is raining," and "Picinics are not much fun in the rain," can be made consonant by changing the behavior and not going on the picnic.

2. Changing an environmental cognitive element. Sometimes it is possible to change elements of the environment. One can surround himself with different people, for example. But generally the individual has less opportunity to change the outside environment than to change the other elements. He could of course attempt to change his cognition about the environment without changing the environment itself, and support this changed cognition by distorted perception. However, it is very difficult to convince yourself it is not raining, for example, when your ears, eyes, and skin tell you it is. On the other hand, if a person's earlier belief about some element of the environment is demonstrated to be in error by later information, changing his belief would be relatively easy.

3. Adding a new cognitive element. Dissonance can be reduced by adding new consonant elements. Thus a person just elected to the presidency of the PTA might realize that she will have to give up other activities that she would enjoy more in order to carry out her new responsibilities. But to back out now would cause severe embarrassment. She could therefore add the cognitions that what she is doing is very important, that the other activities were not so interesting

anyway, that it is only for a limited time, etc., and thus through added cognitions change the ratio of dissonant to consonant elements, and thus reduce dissonance. A dissonance reducing activity, in this case, would be the seeking out of consonant cognitions.

Cognitions vary in their resistance to change. Many cognitions change easily and with little resistance: the weather, the time, a new house being built, etc. Sometimes cognitions can be very resistant to change.

> The first and foremost source of resistance to change for any cognitive element is the responsiveness of such elements to reality. If one sees that the grass is green, it is very difficult to think it is not so. . . . In many instances, however, the reality corresponding to the cognitive element is by no means so clear and unambiguous. When the reality is basically a social one, that is, when it is established by agreement with other people, the resistance to change would be determined by the difficulty of finding persons to support the new cognition (Festinger, 1957).

The maximum dissonance that can occur, according to Festinger, is equal to the resistance of the least resistant of the available means of reducing the dissonance. The outstanding problem with the theory is that it is difficult to test it in many cases because it does not predict which of the several possible modes of dissonance reduction may be used in any given case without also knowing a great deal about the cognitive structure of the individuals in question.

Also, especially in cases where dissonance is strong and means to reduce it are resistant, the reduction could be

made by simultaneously using several of the different mechanisms in different proportion. For example, in the case of a highly discrepant message with high importance, the subject could derogate the source, partially misperceive the message, and bring in other cognitions which would reduce the importance of the message. The proportion of use of any of these (or other) devices would be determined at least in large part by the psychological makeup of the person.

Dissonance theory would seem to predict greater dissonance with greater discrepancy between the opinion of the receiver of the message and the message itself. It would also predict greater dissonance with greater importance. Thus there seems to be nothing in the straightforward application of the theory that would predict a "boomerang" effect. However, because the theory allows for alternative methods of dissonance reduction, it can easily be accommodated to the empirical finding of a boomerang in extreme cases by postulating that at these extreme levels attitude change becomes impossible or not of sufficient strength to reduce the dissonance for the person, and thus source derogation becomes the chosen method. Having thus derogated the source to that point, a shift in attitude away from that advocated by the source is now required for balance (Aronson, Turner and Carlsmith, 1963).

If, however, this explanation is valid, a large derogation of the source of the message should be measurable for

those subjects who showed a boomerang. In a study by Aronson, Turner and Carlsmith (1963) it was found that for a high level of source credibility more attitude change was obtained than for a moderate level of credibility. For the moderate level of credibility attitude change was curvilinearly related to discrepancy (as predicted by social judgment theory). However, the expected increase of source derogation with increasing levels of discrepancy was not found, and in fact a non-significant trend in the other direction was found.

If we assume that attitude change and source derogation were the only two means of dissonance reduction available to the subjects, then this study seems to disconfirm the dissonance theory prediction. However, it is possible that other dissonance reducing factors as yet not specified came into play in this situation, or that source derogation was not measured properly. The study seems to be more supportive of social judgment theory than of dissonance theory, however it does demonstrate the importance of source credibility, a factor not considered in the original formulation of social judgment theory. A boomerang effect was found for the mildly credible source, and none for the highly credible source.

Other studies have been made which found increasing levels of source derogation with lower levels of attitude change at high levels of discrepancy. Miller and Levy

(1967) found decreasing agreement of their subjects with arguments used with increasing levels of discrepancy (the arguments were the same, only discrepancy varied) with a mildly credible communicator. As attitude change decreased with increasing levels of discrepancy, source derogation also increased.

Bochner and Insko (1966) found a curvilinear relationship between discrepancy and attitude change, such that attitude change increased up to a point with discrepancy, then decreased. The inflection point was farther up the scale for the highly credible source as compared to the moderately credible source. They also broke derogation into two components, source derogation and message derogation. The more highly credible source received less derogation, but the message received more. This suggests an element of derogation that was not measured in the Aronson, et al. study which might account for their failing to find increasing source derogation with decreasing attitude change at higher levels of discrepancy.

Thus it seems that while the exact mechanism is not clear, that dissonance theory can give a rationale for the boomerang effect at least partially supported by data. Social judgment theory does not give any basis to expect a difference in levels of attitude change with different levels of credibility. Neither theory alone seems adequate to completely explain the empirical findings.

Source derogation would seem to be an especially serious problem in a communication strategy such as is used in this study, in which the subjects receive a series of messages over time. If the source is derogated as a result of the first message in the series, he will be perceived as having less credibility during the second message (which is more discrepant than the first), which in turn increases the probability that he will be further derogated during that message, and in each succeeding message in turn.

It is therefore conceivable that in a series of messages from one source that the source could be successively derogated in each, and emerge with such low credibility that there would be an increased probability of the boomerang effect. Factors that would heighten this probability would be (1) low initial credibility for the source, and (2) early messages in the series that were too discrepant.

In addition to the obvious strategies to avoid this problem by using only moderately discrepant messages at the beginning of the series, and using a highly credible source, it might also be useful to use a <u>different</u> source for each message segment to avoid any cumulative effect of message derogation. Also, the timing between message segments might be important to maximize the forgetting of the source and the internalization of the arguments.

Personality

As has been mentioned earlier in this paper, the early studies by Sherif and Hovland have been vulnerable to considerable criticism because of their methodology of varying involvement. They selected subjects who were members of groups with known and usually extreme positions on the issues under study. Since this is the case it is reasonable to assume that the groups were also different from each other in other ways that may be relevant to persuasibility, such as intelligence, dogmatism, age, education, social integration, etc. Several have hypothesized that the effects demonstrated by Sherif and Hovland can be more parsimoniously explained on the basis of these factors alone.

Miller and Devine (1968) measured the latitudes of rejection of a group of subjects on approximately 30 attitude dimensions. They found that those with typically broad latitudes of rejection were more strongly resistant to persuasion than those with narrower latitudes of rejection.

Powell (1966) found that dogmatism (Troldahl and Powell, 1965) was positively correlated with position extremity, and that those high in dogmatism also displayed broader latitudes of rejection. This strongly suggests that those with broader latitudes of rejection, and thus more generally resistant to persuasion, are overrepresented in extremist groups.

It would be theoretically useful to vary involvement experimentally in order to measure the effect of involvement on attitude change. Subjects could be randomly assigned to groups, and then involvement increased (or decreased) as needed. However, two problems arise: (1) It has been found to be very difficult to experimentally produce high levels of involvement with an issue, and (2) even experimentally produced involvement leads to greater extremity of position. Thus, since even experimentally produced high involvement is correlated with extremity it offers no advantage in trying to disentangle the two variables.

In summary, personality factors at the present time cannot be ruled out as having some part in producing the effects seen, although there is not a clear theory that would explain exactly how. It seems likely that personality factors may interact with judgment and/or dissonance processes to produce the effect. In the present study personality variables have been controlled by random assignment of the subjects to treatment groups.

Summary of Hypotheses

Given subjects highly ego involved with the issues and a message advocating an attitude position highly discrepant from their own original attitudes, the following would be hypothesized:

H_1 The group given a time interval between message segments will plan to smoke marijuana less often than will the group given no time intervals between message segments.

H_2 More subjects in the group given a time interval between message segments will shift their "most acceptable" position in the direction advocated by the message as compared to the group given no time intervals between message segments.

H_3 More subjects in the group given no time intervals between message segments will shift their "most acceptable" position in a direction opposite to that advocated by the message, than will subjects in the group given a time interval between message segments.

H_4 The group given a time interval between message segments will report that marijuana smoking is more: weak, unpleasant, dangerous, detrimental, anti-social, unhealthy, morally wrong, dumb, dull and bad, than will the group given no time intervals between message segments.

CHAPTER II

METHODOLOGY

Selecting an Issue

In order to achieve the prediced boomerang effect it would be necessary to advocate an extreme position on an issue in which the potential experimental subjects would be highly ego involved. Due to time and money constraints it was necessary to use undergraduate students at the University of New Haven as subjects. In order to select an issue that was ego involving, a number of students in small groups were questioned to identify potential issues. The general impression of this researcher was that the students did not seem to be very involved in anything, and certaintly not in such issues as politics or ecology which had been big issues only a few years earlier.

The three strongest issues that could be identified in this informal manner were pre-marital sex, religion, and marijuana smoking. A short questionnaire was prepared designed to measure strength of feeling on each of these issues, and submitted to a class of approximately 30 students. Examination of the questionnaires showed the marijuana issue to be the strongest for the majority of students. Students were also asked to identify any other issues that they felt

strongly about on the back of the paper. The only other issue identified was "the value of a college education."

An ideal issue would have been one that could have been argued either way. Although there are arguments on either side of the issue of smoking marijuana, ethical and legal considerations ruled out giving the students persuasive messages advocating increased marijuana usage. While a mild position in that direction might be acceptable (such as, urging more toleration of others who smoke marijuana, evidence that for certain diseases the drug may be useful, etc.) an extreme position (such as, "Everyone should smoke marijuana and urge their friends to do so.") could not be advocated. Thus, selection of this issue made it necessary that the study be unidirectional. This does not effect the testing of the hypotheses in any way, except to restrict the pool of potential subjects to those with strongly felt positions on the pro-marijuana smoking side of the issue.

It was, however, felt that those in favor of smoking marijuana would be likely to be more ego involved in the issue than those opposed, on the average, since they were in fact advocating an illegal action, and to actually possess marijuana or smoke it exposed them to some risk, even though small.

On the negative side, since the anti-marijuana messages were to be given out in classrooms, there seemed to be some

probability that students would identify the message as an "establishment" attempt at persuasion rather than objective information. To the extent this might occur it would seem to weaken credibility. However, for the study moderate credibility is more desirable than high credibility, so that effect did not seem objectionable. Also, this effect should be equal for all treatment groups.

Another potential problem that had to be considered with the issue was the potential reluctance of subjects to divulge their position, because of possible personal threat of arrest, exposure, or other use of the information in a way detrimental to the subjects. In the pilot study, to give students assurance that they would not be harmed by what they revealed they were not asked to divulge their own actions, but only what they judged to be appropriate behavior for "college students" in general. In the main study a system was worked out to give the students assurance of complete anonymity so that the questions could be more direct without being threatening to the students.

Messages

For the purpose of this study a persuasive message was needed which could either be read all at one time and make sense in this manner, or be read one segment at a time with time intervening between the segments. Thus each segment would need to make sense in itself and in relationship to the others.

A second consideration was that because of the sensitive nature of the issue it was felt that for ethical reasons all supporting statements to the arguments used in the message would have to be supported by fact or expert opinion. It was felt that it would be unethical to put out incorrect information in the study deliberately, especially since the nature of the study made it impossible to correct any deception for as much as several weeks.

Thirdly, the message segments would need to be designed to be increasingly discrepant from the subject's own opinion, ending up with extreme discrepancy.

Fourth, the messages would need to center around an aspect or aspects of the issue that were ego involving. For this reason and because there seemed to be considerable objective information available which lent itself toward the formation of strong arguments, the issue of marijuana smoking as being detrimental to physical and mental health was chosen.

Fifth, the message segments would have to be understandable. They were written with this criterion in mind, and tested with a small group of students. The test group reported no trouble in understanding. In addition, each subject filled out a brief form at the end of reading each segment, which was included primarily as a means of ascertaining that the student had read the message segment, but also included a question about understandability. No problems were found

except that in the pilot study two students reported not understanding the word "rhesus," a type of monkey. The item was rewritten for the main study with the word omitted.

Finally the information used should be as recent as possible so that as many students as possible would not have heard it before. Those students who have heard the particular arguments and information backing them before might already have counterarguments formed, thus might be more highly resistant to persuasion. Additionally, there would be a differential in resistance to persuasion based upon having heard the facts before, which might be related to ego involvement and thus to media exposure (MGuire, 1968). This could be explained as information seeking behavior to reduce dissonance caused by engaging in a practice that is known to be potentially harmful. If the information could be very current this effect would perhaps be minimized.

With these criteria in mind, library research was done to gain information about the negative effects of smoking marijuana to the individual's mental and physical well being. The facts and arguments were then arranged in order of ascending discrepancy from the viewpoint of a marijuana smoker. Those elements which seemed to fit the logical ordering best were selected, and the messages written. The message segments used in the two studies were the same, except for some very minor modification of the first three segments, and a complete re-write of the fourth segment to

make it still more extreme. (See message segments, Appendix B, pages 86-89.)

No guidance was found from past studies to suggest how many segments the message should be divided into. It seemed logical that more steps would mean smaller increments of persuasion at each step, thus taking longer, but perhaps making persuasion more nearly sure. With no theoretical guidance, it was arbitrarily decided to break the message into four segments for practical reasons. Four segments were the most that could be utilized in the time available in the pilot study, in which one treatment group received two weeks between segments.

Time

Again, no theoretical guidance was found in the literature as to the optimum amount of time between successive message segments, so it was arbitrarily decided to do the pilot study in three levels, with no time between segments for treatment group 0, one week between segments for treatment group 1, and two weeks between segments for treatment group 2 (see chart, p. 37). Although the results from the pilot study were not statistically significant, there seemed to be a tendency that the one week treatment was more effective than the two week treatment, thus in the main study a contrast was made between zero time between segments and one week between segments. During this study, time was not varied into more levels in order to have larger n's in the

Table 1. Pilot Study Time Plan.

Week	Group 0	Group 1	Group 2
1.	Pretest	Pretest	Pretest
2.			
3.	Segments 1,2,3,4 Post-test	Segment 1	Segment 1
4.	Dummy message	Segment 2	Dummy message
5.	Dummy message	Segment 3	Segment 2
6.	Dummy message	Segment 4 Post-test	Dummy message
7.	Dummy message	Dummy message	Segment 3
8.			
9.	Dummy message	Dummy message	Segment 4 Post-test

Table 2. Main Study Time Plan.

Week	Group 0	Group 1
1.	Pretest	Pretest
2.	Dummy message	Segment 1
3.	Dummy message	Segment 2
4.	Dummy message	Segment 3
5.	Segments 1,2,3,4 Post-test	Segment 4 Post-test

groups, and because the total time available for the study limited the time per message segment to one week.

Subjects

For a variety of reasons, especially economy and time, undergraduate students at the University of New Haven were used as experimental subjects. All of the students for the pilot study were in classes taught by the experimenter, while all of the students for the main study were from classes taught by other professors. In each case all students in the classes were told that cooperation in the study was voluntary, then were pre-tested. The pre-test was used to determine which students would qualify as subjects in the experiment. In the pilot study only those with moderate to high levels of frequency of use of marijuana were selected. In the main study those with latitudes of rejection of four or more, and with "most acceptable" positions of neutral to highly favorable to marijuana smoking were selected. In each case this represented about half of the average class.

In both studies the students were not told that only some of them were being used as subjects. All students were given the appropriate materials, depending on which group they had been randomly assigned to. This was done so as to not give away the real nature of the study any more than necessary, and especially not to cause any reason for speculation as to why some were chosen and others not. The questionnaires from the students who were not selected were

simply discarded.

In the pilot study, random assignment to treatment group was done by preparing a list of the student numbers of the pre-tested students, choosing a random starting point, and assigning the students in sequence to groups 0, 1, or 2. The students were told that they were all receiving the same materials, but in different order. They were told that the research concerned their evaluation of the materials, uncontaminated by the opinions of others, and so they were asked for cooperation in not discussing the content of the messages until after the study was complete. The students seemed to accept this, and no violations were noticed or reported (which of course certainly does not mean that there were none).

It was decided that in the main study it would be desirable to give the students complete anonymity. At the same time it was necessary to make the study easy to administer by professors who would do so voluntarily in their classrooms. The method that was finally devised was to stuff the pre-test along with an explanatory letter into an envelope, and place on the outside of the envelope a computer generated label giving a "participant number." The envelopes were handed out randomly to the students as they arrived in class, in such a way that no one but the student knew his participant number. The student was cautioned to write down the number in a place where it would not be lost and that

successive messages would be "addressed" to him by means of this number. Each successive week he was to select the envelope with the appropriate number.

Each week the professors were given envelopes with the proper range of participant numbers. They were to place these on a table, and ask the students to select their own. There were no complaints from either faculty or students concerning the method. (See introductory letter and pre-test, Appendices C and D, pages 90-94.)

One potential problem with a study which has a pre-test, four message segments, and a post-test, is that a fair percentage of students will miss at least one part, thus disqualifying themselves from the study. To minimize this problem in the pilot study (especially since the classes and therefore the n's were already small), the materials were made available to the student the first class meeting of the week. For those students who missed the first class meeting but attended successive meetings, the materials were given to them at those times. Thus a student would have to miss every class meeting of the week in order to be disqualified, and drop outs were kept to a relatively small percentage.

For the main study, however, it could not reasonably be expected that other professors would be willing to do this kind of "bird dogging," and the drop out rate is higher. However, comparing pre-test data for drop outs with those who completed the study revealed no significant differences.

Measuring Instruments

In the pilot study the same instrument was used for both pre- and post-tests. It was patterned after one used by Sherif and Hovland (1961). An indirect measure of student attitudes was used because it was felt that a direct measure would be threatening to them (as discussed earlier). The instrument was designed to be projective, that is, to measure the student's own attitude, as ascribed to "college students" in general. Although a pre-test with a small group of students revealed no such problem, there was an occasional problem with the wording of the test, in that a student in each of the first two classes where the test was administered asked what was meant by "should" (see pre-test, Appendix A, pp. 82-85). Therefore, in those classes and in each successive class where the instrument was used it was explained that what was meant was their own attitude about what college students ought to do, based upon their own knowledge, beliefs, and feelings, and not on any other standard. This seemed to solve the problem for the students, although perhaps not the conceptual problem.

The first instrument measured the number of times per unit time that a student thought "college students" should smoke marijuana. A rate measure was tried because it translates into a ratio scale, thus making available powerful data analysis techniques. Unfortunately, however, the pilot study demonstrated that the scale did not cover all of the

possible range of attitudes adequately, especially in the negative direction. There was no scale point beyond indicating that the student felt college students should never smoke marijuana. However, the message advocated a position stronger than this, which the scale could not measure!

Another problem with the pilot study instrument was that students became confused with the form. A few of them took each page to be identical, read the instructions on the first page and checked the identical places on each successive page. Before the post-test most of this was avoided by emphasizing that each page was different and that it was important to carefully read the directions, and also by including some hand-written emphasis to important parts of the instructions.

The form of the measuring instrument used in the main study differed in that it measured a wider range of attitudes, from extremely pro to extremely anti marijuana smoking. In doing so , however, the scale became ordinal rather than ratio in nature. The scale was devised by generating a large number of attitude statements, trying to arrange them in order from most positive to most negative, and finally selecting those which seemed clearest and most representative of distinct attitude ranges.

Each statement is designed to represent only a certain range of attitude, and thus be found objectionable to those at some distance on either side. Attitude statements that

could be found agreeable to anyone whose own attitude was in the same direction, no matter how far were unacceptable for the purpose (an example would be, "Marijuana smoking is pleasant." Presumably anyone above neutral could agree with that statement).

Although the items are designed to have limited width, they cannot be assumed to all have the same width, nor can they be assumed to be the same distance apart. Thus the scale is only ordinal. The ordinality of the scale was tested by printing the items on small pieces of paper and giving them in random order to a group of students, who were instructed to order them from most favorable to marijuana smoking to least favorable to marijuana smoking. Out of 15 students the agreement was perfect for 13, with two making one error each. The one item they erred on was subsequently modified slightly to clarify its position.

The most direct measure of attitude change was to ask students to estimate the number of times they plan to smoke marijuana over the next four weeks. In addition this measure has the advantage of being a rate, and thus ratio scaling is applicable.

Semantic differential scales were used in the post-test in an attempt to get greater validity through measurement of attitudes and projected actions that should be correlated with the main measures. The items were chosen to tap a wide diversity of attitudes relating to marijuana usage. In

addition to seeking to broaden the validity of the main finding, this was also partly a "fishing expedition" to see if any relationships might turn up that would be of help in explaining the findings.

Research Design

Research design is intended to aid the measurement of the relevant variables while controlling to as high a degree as possible all extraneous variables which might confound the results. Two classes of error need to be controlled: type "S" error, and type "G" error.

Type "S" error refers to the differences between subjects which exist before the experimental manipulation, which may confound the measurement of the dependent variables, and may interact with the experimental treatment. Type "S" error can be controlled in two ways. The first is by carefully selecting subjects so that they are matched on any factors that might be relevant to the study, and assigning one from each matched set to each treatment group. This method is weak because of the inherent complexity of the human organism, and our current lack of knowledge of, and/or ability to measure all of the relevant variables.

The second and more practical way of controlling type "S" error is by randomly assigning subjects to treatment groups, and then performing a significance test at the end of the study. If subjects are randomly assigned to treatment groups, it can be assumed that all relevant aspects of

the individuals will be approximately equally distributed among the treatment groups, and thus will effect each group about equally. Even though there would always be some variation from the ideal, the variation over a large number of studies is known and can be taken into account. This is done by the statistical test.

The purpose of the statistical test is to estimate the chance of the effect which has been found being caused by random error alone. If the differences are sufficiently large so that it does not seem likely that they are caused by random error (type "S" error), we are willing to accept the validity of the findings.

The second type of error that the research design tries to eliminate is type "G" error. This refers to differences between treatment groups caused by events that take place after randomization. This is controlled by the experimenter by carefully treating all groups exactly the same in all respects except for the experimental manipualtion. If the only difference in what happens between groups is the experimental manipulation, then, within the limits of the necessity of correcting for type "S" error, the experimenter can say that any difference found is as a result of the experimental manipulation. If there are other differences between groups, however, no such statement can be justified.

In this study, type "S" error is controlled by randomly assigning subjects to treatment groups, and the use of statistical tests. Type "G" error is controlled by taking pains that as nearly as possible all aspects of the study, other than the experimental manipulation, remain the same for all groups. This effort included providing "dummy" messages with the same evaluation forms for groups not receiving an experimental message on any given day. Each participant in the study received exactly the same materials, each in a classroom setting which contained matched numbers of members of the various groups.

One possible problem with the pilot study was that the post-test for group 0 was taken during the third week, for group 1 was taken during the 6th week, and for group 2 was taken during the 10th week. This was done so that all groups could take the test immediately after the last segment to standardize and minimize any effect of forgetting. (Please refer to the chart of this study on page 37.) However, any extraneous outside influences that might have occurred over time would not have been controlled by this design. There was, in fact, some debate about legalization of marijuana in the Connecticut legislature during the study, which could well have had an effect on the groups differentially because of the various post-test times.

The main study improved on this by giving group 0 dummy messages during the early weeks (see p. 37), and both post-tests during the 5th week.

Another way to reduce type "S" error is to use a before and after measurement design. If the same instrument (perhaps in another form) is used, the "before" results can be subtracted from the "after" results, leaving only the change as a result of experimental manipulation, plus any error caused by other random influences during the intervening time period, plus any interaction effects of the pre-test on the manipulation.

It is because of this possible interaction with the pre-test that a before-after design is considered weak. The interaction effects can probably be reduced by interposing enough time between the pre-test and the manipulation. In the pilot study the time allowed was two weeks, in the main study, one week. This is a potential weakness of the study, but could not be avoided since the summer sessions are only five weeks long, and no other suitable group of subjects was available.

Although this researcher would have preferred not to use a pre-test because of the problem of possible interaction, it was made necessary in order to select subjects who, prior to exposure to the message, were highly involved in the issue and had an extreme enough initial stand to allow movement in the direction advocated by the message. Interaction effects should not invalidate the findings, since both groups would be similarly effected.

Since a pre-test was deemed necessary in order to select subjects, it was decided to use the same form as the post-test so that before-after comparisons could be made. In the main study a second group of measures, in an after only design, was also made.

Statistical Testing

Statistical tests are used to test whether or not differences observed between groups on any parameters measured can be assumed to be the result of the experimental manipulation rather than just random variation. In this study differences are considered to be statistically significant if they achieve the .05 level of significance. This level seems to be generally well accepted in the social sciences.

All statistical tests when used for experimental research require two basic assumptions: (1) Random assignment of subjects to groups and (2) no extraneous differential treatment of the groups. Statistical tests also require assumptions about the nature of the relationships between the numbers used. Parametric tests, such as the t-test, assume an interval scale. The pilot study measured the rate of marijuana smoking, and the main study measured the projected future rate of marijuana smoking, both measures would be ratio scales, more than meeting the assumption of equal intervals.

Semantic differentials have been defended by the originators as essentially interval in nature, and have been

generally treated as such in social science research (Osgood, Suci, Tannenbaum, 1957). For all of these, the t-test is a powerful and appropriate test.

In the main study a scale was devised that can only be defended as being ordinal, since the items can be demonstrated to be in order, but not of constant distance apart or width. Thus it is appropriate to use tests that make only the assumption of ordinal measurement, or less. A powerful general test of the difference between distributions at the ordinal level is the Kolmogorov-Smirnoff two-sample test. It has approximately 96 percent of the power efficiency of a t-test without the assumption of equal intervals (Siegel, 1956).

A chi-square test will be used to test specific hypotheses that require dichotomization of data. This test, requiring only nominal level data, compares the differences between data in discrete categories.

CHAPTER III

FINDINGS

The Pilot Study

The pilot study compared three groups, group 0, with no time between message segments, group 1, with one week between segments, and group 2 with two weeks between segments. In each group statistically significant attitude change in the direction advocated by the message was achieved, as measured by the movement of the average "most acceptable" positions of the subjects (Table 3, p. 51).

There was also a statistically significant movement of the "most unacceptable" position in the opposite direction for groups 0 and 2, which is in the direction predicted. For group 1 there was a non-significant movement in the predicted direction.

The amount of change in the "most acceptable" position was greatest for group 1, and least for group 2, with group 0 between. However, the differences between groups were not large enough to be statistically significant (Table 4, p. 52).

The one week treatment seemed superior to the two week treatment. In fact, the two week delay treatment was slightly less effective than the zero delay treatment. This suggests the possibility that the relationship between time

Table 3. Pilot Study Before-to-After Change.

Differences Between Pre-test and Post-test	Group 0	Group 1	Group 2
"Most acceptable" position	-1.71*	-2.09*	-1.10*
"Most unacceptable" position	+2.39*	+1.00	+3.60**
Latitude of acceptance***	-.53	-.73	-.10
Latitude of rejection	+1.00	-.33	+.70
Latitude of indifference	+1.21	-.36	-.20

For the "most acceptable" position, negative change is in the direction advocated by the message. For the "most unacceptable" position, positive change is in the direction advocated by the message.

Group 0 had no time between message segments, group 1 had one week between, group 2 had two weeks between segments.

*Statistically significant beyond .05 level by t-test for related measures.

**Statistically significant beyond .005 level by t-test for related measures.

***Positive differences in latitudes of acceptance, rejection or indifference denote a wider latitude in the post-test than in the pre-test. Negative difference denotes a smaller latitude in the post-test than in the pre-test.

delay intervening segments and attitude change many be curvilinear, although, of course, no such conclusion can be drawn on the basis of the pilot study data because of lack of statistical significance.

In summary, while the trends demonstrated in the pilot study seemed in harmony with the hypotheses, no definite conclusions can be drawn because the differences observed

Table 4. Pilot Study Differences Between Mean Scores.

Comparing Before-to-After Difference Scores for each Group	
"Most Acceptable" Position	
Group 0 minus Group 1	-.38*
Group 0 minus Group 2	+.61
Group 1 minus Group 2	-.99
"Most Unacceptable" Position	
Group 0 minus Group 1	-1.39
Group 0 minus Group 2	+1.21*
Group 1 minus Group 2	-2.60

Group 0 had no time between message segments, group 1 had one week between segments, group 2 had two weeks between segments.

*This difference between groups is in the direction hypothesized.

between groups were not sufficiently large to allow the null hypothesis to be rejected.

Main Study

In the main study only two groups were compared in order that the numbers might be larger for each group. Group 0 had no time delay between segments, and group 1 had one week delay, based upon the results of the pilot test. In this study some data were collected both before and after the manipulations, so that change scores on each individual are available for these items. Where available these change scores are reported rather than the "after" scores. "After" scores are reported where "before" measures were not taken.

Subjects to be included were selected on the basis of "involvement" as operationalized by a high latitude of rejection, as discussed earlier. The cut off initially was arbitrarily set at four. That is, any subject with a latitude of rejection of four or more was considered to be "involved."

However, it also seemed useful to analyze the data with a higher criterion of involvement, and thus for a second analysis a latitude of rejection of five or more is used. Finally, the data are reanalyzed with a latitude of rejection of six or more.

Latitude of Rejection of Four or More

Analysis with latitude of rejection at four or more gives results that are somewhat mixed. Considering before-to-after change in the subjects' "most acceptable" positions, the group with one week between message segments (group 1) showed more total change in the direction advocated as well as in the opposite direction than did the zero delay group, but only the change in the zero delay group was statistically significant (Table 5, p. 54).

Fifty percent of group 1 changed in the direction advocated (the direction predicted), as compared to only 41 percent of group 0. However, the change in the other direction must also be considered. There is a negative change of 19 percent for group 1 and only six percent for group 0. Subtracting the negative change from the positive change for

Table 5. Percentage of Respondents with Changes in Before-to-After Scores When Before Latitude of Rejection Equals Four or More.

Direction of Change	Change in: Most Acceptable Position***		Most Unacceptable Position		Latitude of Acceptance		Latitude of Rejection	
	Group	Group	Group	Group	Group	Group	Group	Group
	0**	1	0	1**	0	1	0	1
Negative Change	6%	19%	24%*	35%*	44%	54%	38%	50%
No Change	53%	31%	65%	62%	29%	27%	35%	23%
Positive Change	41%*	50%*	12%	4%	26%	19%	26%	27%
Number	34	26	34	26	34	26	34	26

*Denotes change in direction advocated by message.

**Before-to-after change significant beyond .05 by McNemar test.

***Difference between groups significant beyond .05 by Chi-square test.

both groups gives group 1 a net change in the positive direction of only 31 percent of the subjects, compared to a net positive change of 35 percent for group 0. This difference between groups, although small, is in the direction opposite to what the theory would predict. Some possible explanations for this are explored in the following chapter.

Another unexpected finding was a larger negative change in the "most acceptable" position for group 1 than for group 0. This represents boomerang, change in the direction opposite to what the message advocated. The hypothesis had predicted more boomerang for group 0 than for group 1, the opposite to what was found.

Before-to-after change in the "most unacceptable" position recorded by respondents in group 1 was significant, and in the direction predicted, while in group 0 the change was not significant. Differences between the groups were not significant. There were no significant differences "before-to-after or between groups in the latitudes of acceptance or rejection.

An "after only" measure was taken in the semantic differential scales (Table 6, p. 56). Only one item showed a difference between groups large enough to be statistically significant. This was on the issue of safe versus dangerous. That this issue should show the largest difference is not surprising since this issue was most directly touched upon by the message. However, the direction of the difference is

Table 6. Means of Semantic Differential Scales When Before Latitude of Rejection Equals Four or More.

	Group 0	Group 1	Difference
Marijuana smoking is:			
1. Weak-Strong	3.843	4.160	+.317
2. Pleasant-Unpleasant	3.878	2.807	+.071
3. Safe-Dangerous	4.847	3.500	-.670*
4. Detrimental-Beneficial	3.666	3.800	+.214
5. Sociable-Antisocial	3.147	3.000	-.147
6. Unhealthy-Healthy	3.411	3.384	-.065
7. Morally Right-Wrong	3.705	3.730	+.025
8. Dumb-Smart	3.558	3.961	+.403
9. Exciting-Dull	3.382	3.423	+.041
10. Bad-Good	3.970	4.500	+.530
Numbers	34	26	

*Significant beyond .05 by t-test.

Note: Word underlined above illustrates direction of difference of treatment group from control group on the item that was statistically significant.

surprising, since those who received the message segments at one week intervals (group 1) saw marijuana as less dangerous than did those who received the message all at one time. This is contrary to the prediction.

In addition, many of the other semantic differential measures show non-significant tendencies in the same direction,

opposite to the predicted direction.

The final and most important criterion measure was an estimate of the number of times the student predicted he would smoke marijuana in the next four weeks (Table 7).

Table 7. Estimates of Future Smoking When the Before Latitude of Rejection Equals Four or More.

	Group 0	Group 1	Difference
Mean estimate of the number of times subjects will smoke marijuana in the next four weeks:	3.735	1.923	-1.812*
Percentage of subjects who will smoke marijuana in the next four weeks:	56%	54%	-2%
Mean estimate of the numbers of times subjects who will smoke marijuana at all will smoke it:	6.684	3.571	-3.113*

*Differences are in the direction predicted but not statistically significant by t-test.

Although about the same percentage of students plan to smoke marijuana at least once in the next four weeks, the students in group 1 will smoke it less often, as predicted. The difference between groups is of fairly good size, but not statistically significant, perhaps because of high variance.

In summary, with latitude of acceptance of four or more as the operationalization of "high involvement," the findings

cannot be said to support any of the hypotheses. There are certainly important and statistically significant differences between the groups as shown by stronger before-to-after movements of the "most acceptable" positions of the one week delay group (group 1) in both directions, and by a significant change in the "most unacceptable" position in the predicted direction by group 1 only. A fairly strong, though non-significant tendency of group 1 to predict less future smoking of marijuana makes it very surprising that this same group sees marijuana smoking as being significantly less dangerous than does the zero delay group.

Latitude of Rejection of Five or More

Since one of the conditions for the hypotheses is a high degree of "involvement," but involvement has been operationalized arbitrarily as a latitude of rejection of four or more, it was decided to reanalyze the data with a higher criterion of involvement.

The picture begins to clear up considerably when the operationalization of involvement is set at a latitude of rejection of five or more. Differences were generally more nearly in the direction hypothesized, but n's were smaller (group 0=20, group 1=16).

At this level there is a more distinct difference between the groups in their "most acceptable" positions (Table 8, p. 59). In group 1 the before-to-after change was significant by McNemar test, with 56 percent changing in a

Table 8. Percentage of Respondents with Changes in Before-to-After Scores When Before Latitutde of Rejection Equals Five or More.

Direction of Change	Change in: Most Acceptable Position		Most Unacceptable Position		Latitude of Acceptance		Latitude of Rejection	
	Group	Group	Group	Group	Group	Group	Group	Group
	0	1**	0	1	0	1**	0	1
Negative Change	5%	13%	25%*	25%*	40%	56%	50%	50%
No Change	60%	31%	70%	69%	25%	31%	30%	25%
Positive Change	35%*	56%*	5%	6%	35%	13%	20%	25%
Number	20	16	20	16	20	16	20	16

*Denotes change in direction advocated by message.

**Before-to-after change significant beyond .05 by McNemar test.

positive direction, 13 percent changing in a negative direction, leaving a net change of 43 percent in the direction advocated. Group 0 had only 35 percent changing in the positive direction, 5 percent changing in a negative direction, for a net positive change of 30 percent. The before-to-after change in group 0 was not statistically significant, nor was the difference between the two groups.

Changes in "most unacceptable" positions were not significant for either group. Change in the latitude of acceptance was significant for group 1, but not for group 0, and changes in the latitude of rejection were not significant for either group.

On the semantic differential scales (Table 9, p. 61) none of the differences is large enough to be statistically significant, and, in fact, the differences between means are all considerably smaller than at the previous level of involvement. However, the tendency on several items is still opposite to the direction predicted.

On the main criterion measure, estimates of the number of times the students will smoke marijuana in the next four weeks (Table 10, p. 62), the differences between the groups are considerably stronger, attaining significance by t-test, and are, as before, in the direction predicted.

Thus, with involvement operationalized as a latitude of rejection of five or more there is a greater attitude change when the message segments are given at one week intervals

Table 9. Means of Semantic Differential Scales when Before Latitude of Rejection Equals Five or More.

	Group 0	Group 1	Difference
Marijuana smoking is:			
1. Weak-Strong	4.111	4.312	+.201
2. Pleasant-Unpleasant	2.736	2.875	+.139
3. Safe-Dangerous	4.000	3.625	-.375
4. Detrimental-Beneficial	3.894	3.933	+.039
5. Sociable-Antisocial	2.900	3.000	+.100
6. Unhealthy-Healthy	3.450	3.562	+.112
7. Morally Right-Wong	3.750	3.875	+.125
8. Dumb-Smart	3.600	4.000	+.400
9. Exciting-Dull	3.250	3.625	+.375
10. Bad-Good	4.050	4.437	+.387

None of the differences is statistically significant.

than when they are given all at one time.

Latitude of Rejection of Six or More

If the criterion of involvement is made still higher, operationalized as a latitude of rejection of six or more, these effects become still stronger, but statistical significance becomes still harder to attain because of the extremely small numbers, 9 in each group (Tables 11, 12 and 13, pp. 63-65.

Table 10. Estimates of Future Smoking When the Before Latitude of Rejection Equals Five or More.

	Group 0	Group 1	Difference
Mean estimate of the number of times subjects will smoke marijuana in the next four weeks:	3.6	.94	-2.66*
Percentages of subjects who will smoke marijuana in the next four weeks:	50%	50%	0
Mean estimate of the number of times subjects who will smoke marijuana at all will smoke it:	7.200	1.875	-5.325**

*Difference in the direction predicted and significant beyond .05 by t-test.

**Difference in the direction predicted and significant beyond .025 by t-test.

Even with these small numbers, there is a significant difference between groups in the amount of future marijuana smoking predicted. As at the previous level, none of the differences in the semantic differential scales is significant. The before-to-after change in "most acceptable" position is significant for both groups, but the difference between groups is not significant.

Table 11. Percentage of Respondents with Changes in Before-to-After Scores When Before Latitude of Rejection Equals Six or More.

Direction of Change	Change in: Most Acceptable Position Group		Most Unacceptable Position Group		Latitude of Acceptance Group		Latitude of Rejection Group	
	0**	1**	0	1	0	1	0**	1
Negative Change	0%	11%	11%*	22%*	33%	44%	67%	56%
No Change	56%	11%	89%	56%	22%	44%	33%	22%
Positive Change	44%*	78*	0%	22%	44%	11%	0%	22%
Number	9	9	9	9	9	9	9	9

*Denotes change in direction advocated by message.

**Before-to-after change significant beyond .05 by McNemar test.

Table 12. Means of Semantic Differential Scales When Before Latitude of Rejection Equals Six or More.

	Group 0	Group 1	Difference
Marijuana smoking is:			
1. Weak-Strong	3.571	4.333	+.762
2. Pleasant-Unpleasant	2.250	3.333	+1.083
3. Safe-Dangerous	4.111	3.666	-.445
4. Detrimental-Beneficial	3.555	3.555	$\pm$0
5. Sociable-Antisocial	3.000	3.111	+.111
6. Unhealthy-Healthy	3.111	3.333	+.222
7. Morally Right-Wrong	3.888	4.000	+.112
8. Dumb-Smart	3.555	4.000	+.445
9. Exciting-Dull	3.111	3.888	+.777
10. Bad-Good	3.888	4.444	+.555

None of the differences are statistically significant.

Summary of Results

In summary, given sufficiently "involved" subjects, as operationalized by a "before" latitude of rejection of five or more, subjects changed attitude in the direction advocated significantly more when exposed to a message divided into four segments with one week intervals between segments than they did to the same message when given all at one time.

H_1: "The group given a time interval between message segments will plan to smoke marijuana less often than will the group given no time intervals between message segments." It was strongly supported.

Table 13. Estimates of Future Smoking When the Before Latitude of Rejection Equals Six or More.

	Group 0	Group 1	Difference
Mean estimate of the number of times subjects will smoke marijuana in the next four weeks:	5.22	1.00	-4.22**
Percentages of subjects who will smoke marijuana in the next four weeks:	56%	33%	-23%*
Mean estimate of the number of times subjects who will smoke marijuana at all will smoke it:	9.4	1.0	8.4**

*Difference in the direction predicted, not significant.

**Difference in the direction predicted, significant beyond .05 level by t-test.

H_2: "More subjects in the group given a time interval between message segments will shift their 'most acceptable' position in the direction advocated by the message, as compared to the group given no time intervals between message segments."

It was partially supported in that a statistically significant change in the predicted direction was found in the group given time intervals between messages, while the change in the group receiving no time intervals between messages was smaller and not significant. However, a statistical test comparing the two groups did not achieve significance.

H_3: "More subjects in the group given no time intervals between message segments will shift their 'most acceptable' position in a direction opposite to that advocated by the message, than will subjects in the group given time intervals between message segments."

Hypothesis 3 was not supported. There was instead a non-significant trend in the other direction.

H_4: "The group given a time interval between message segments will report that marijuana smoking is more: weak, unpleasant, dangerous, detrimental, anti-social, unhealthy, morally wrong, dumb, dull, and bad, than will the group given no time intervals between message segments."

This hypothesis was not support. For several of these, there were non-significant trends in the opposite direction.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

Although only one hypothesis was strongly supported, it is the hypothesis that would seem to offer the most predictive power, since it is the students' own estimates of their future behavior. The effect seems to be strong enough to be not only of theoretical interest, but practical use. It would, therefore, seem as if the findings support the value of interspersing highly discrepant message segments with intervals of time, especially when given to highly ego involved subjects.

Although the main finding was in the direction predicted, the study does leave quite a number of theoretical questions unanswered. For example, more boomerang effect was predicted in the zero time interval group than in the one-week time interval group, on the basis of Social Judgment Theory. However, the present study found less boomerang effect in the no-time-interval treatment, but also less total change. If the difference in total change were a result of the boomerang effect, then there would have been more boomerang for less change. The opposite was found.

Several explanations seem possible. One of these is suggested in the first chapter. For certain subjects the

initial message may have been too discrepant, the source too weak, leading to further source derogation successively through each message and thus to a stronger boomerang effect than would have occurred had the message segments been received all at one time. This idea has some credence since there was more boomerang in the group receiving messages with time interval between.

However, a possible problem with this explanation is that one would expect boomerang to be strongest with the most highly ego involved subjects (the more highly ego involved, the more resistant to change), but most of those who boomeranged were the less involved subjects, so that the effect largely disappears when the minimum latitude of rejection criterion is raised to five.

It may be that so little boomerang is present in group 0 because either the message was not discrepant enough, or the level of involvement was not strong enough. As far as involvement is concerned, it has already been observed that boomerang incidence did not seem to increase with involvement, as would be expected, although the numbers were too small to draw any firm conclusions. Also, it would seem logically that it would be hard to imagine a more extreme position (to the marijuana smoker) than the one advocated.

Another possible explanation is that breaking the message into segments may have increased its total perceived impact or importance. The message might then be perceived

as several separate messages, the effect of which would be greater than "the sum of the parts." A single message in isolation may be easier to discount or discredit than a series over time, even though the content is the same. Each message segment may serve as a partial reinforcer of the memory of past segments, so the effect might be as if important parts of earlier messages had been repeated. Thus, if the perceived importance were heightened, or the message "learned" better through the treatment over time, one might expect more change both negative and positive as a result.

Still another possible explanation is that early segments of the message in the treatment that received time intervals between segments might have temporarily raised the subjects' level of involvement sufficiently to have one of two effects. It might increase interest and attention, promoting better understanding and thus greater persuasion. The other effect might be increased incidence of boomerang. Since high involvement has been operationalized as high levels of latitude of rejection, and since pre- and post-measures of latitude of rejection are available, it might be expected that latitude of rejection would be higher for group 1 than for group 0. The data, however, show quite the opposite (see Table 5 p. 54). While the groups change almost equally in a positive direction, 50 percent of the members of group 1 changed in a negative direction, while only 38 percent of group 0 changed in a negative direction. Thus

the total net change of group 0 is 12 percent to a smaller latitude of rejection, (less involvement) while 27 percent of group 1 changed to a smaller latitude of rejection.

It may, however, still be that involvement is heightened temporarily by early messages, and that this effect is washed out of the final measures by the effect of the attitude change, or the lessened latitude of rejection may be an artifact of the measuring instrument. Both groups at all beginning levels of involvement tend to move toward narrower latitudes or rejection. Most change their attitudes somewhat in the direction advocated, but do not move to the extreme advocated. Thus, most of them are moving to a more central position, and since ego involvement is known to be related to extremity, we would expect from this a decrease in involvement, which was found (although not significantly). The greater the change toward a more central position, the less involvement after the attitude change. Thus higher interim involvement might for some heighten interest and facilitate learning and thus attitude change, bringing about lowered involvement as the end product. For a few others it might bring about the boomerang effect.

A second major problem with the findings is that the semantic differential scales generally show group 1 to be more positive toward marijuana smoking, while the estimate of the number of times that the subjects plan to smoke marijuana over the next four weeks shows group 1 to predict

significantly less frequent smoking. Only one of the semantic differential scales is statistically significant, and that only when the latitude of rejection is four or more. As the criterion becomes more stringent the differences between groups on the semantic differential scales become less, while the differences in the number of times the subjects will smoke marijuana becomes greater. Thus, for more highly involved subjects there is no significant difference between groups in their responses on the semantic differential scales.

Interestingly, the one item on which the groups differ enough to be statistically significant deals with the safety of smoking marijuana. Those who see it as more safe (group 1) will smoke it less. This difference could be an artifact of the research design. Group 0 took the post-test immediately after reading all of the message segments, while group 1 took it after reading the last segment. The first segment had been read three weeks earlier, the second two weeks earlier, and the third one week earlier. Thus some aspects of the message may have been forgotten, and the message generalized as being against marijuana smoking, and remembered as such. In other words, the subject may have internalized the anti-marijuana smoking part of the message, but forgotten some of the details.

On the other hand, it may take some amount of time for the members of group 0 to digest and internalize the message they had just read and to draw the conclusions for themselves

that they should reduce their smoking. Unfortunately no later measures were possible in this study to see if the advantage of giving the message in segments over time would still remain after a few weeks or months.

The Findings and Social Judgment Theory

Although not all of the findings can be explained by Social Judgment Theory, the main findings are in harmony with the theory. Social Judgment Theory suggests a curvilinear relationship between attitude change and discrepancy (under conditions of high involvement) such that as discrepancy increases so does attitude change up to a point, and then discrepancy beyond that point causes less attitude change, and finally negative attitude change.

The current findings could be explained by Social Judgment Theory as being caused by (in the case of group 0) discrepancy falling on the part of the curve past the highest portion, but not yet so discrepant as to cause an actual negative attitude change (boomerang). By breaking the message into segments separated in time the second and subsequent segments might be perceived to be not as discrepant because of the attitude movement of the first segments, and thus would fall on a higher portion of the curve, causing more attitude change (see Figure 1, p. 15). This interpretation would harmonize all of the findings except for the semantic differential scales, and this problem tends to disappear with higher levels of involvement.

The Findings and Cognitive Dissonance Theory

The findings can also be explained by Cognitive Dissonance Theory, although it seems to offer little predictive power in this case. Two classes of explanations seem possible. On the one hand it may be that the treatment by segments separated in time may cause more dissonance, thus more attitude change. On the other hand, the method may interfere somewhat with some other dissonance reducing mechanisms, making attitude change more probable as a means of reducing dissonance.

As suggested earlier, a series of messages separated in time may partially reinforce each other and thus have more total impact. This could cause greater dissonance. Also, the dissonance caused by earlier messages could be remembered and more strongly associated with marijuana smoking upon exposure to later messages.

The most obvious alternative dissonance reducing mechanism is source derogation. It may be that for most subjects it is more difficult to derogate the source when the messages are read in segments over time. This also could be an example of the "sleeper effect," that is, that the source is forgotten more rapidly over time than is the message. If this were occurring, a message that the receiver might at first reject by source derogation might be remembered and internalized over time, causing less source derogation for succeeding messages. However, for certain other subjects the source

derogation might be remembered more intensely, which might cause additional derogation of succeeding messages, and thus boomerang.

Personality Factors

In the present studies personality factors were controlled by randomization. Thus it can be said with some confidence that it is not necessary to know anything about the personality of the subjects in order to predict the results to the degree of accuracy found so far.

However, since it seems likely that certain personality types are more likely to react in a given way than are others, more precision in prediction could no doubt be achieved if personality factors in the intended audience were known and controlled for. Accordingly it would be useful for future research to include some measures of applicable personality factors.

Personality factors were not measured in the present research for two reasons: (1) The research design was sufficiently complicated and took so much class time that it was sometimes difficult to get professors to use it, so longer questionnaires seemed unjustified. (2) This researcher is primarily interested in mass communication, where personality factors are seldom known with a degree of precision sufficient to make them very useful.

Future Research

In addition to the unanswered questions already mentioned, future research should look into the magnitude of discrepancy of each message segment, and the amount of time between segments. As noted earlier, the division of the message into four segments was done arbitrarily and to fit conveniently into the time available. Additional research is needed to learn what the optimum magnitude of discrepancy of message segments would be. By "magnitude of discrepancy" it is meant the amount of attitude change that should be advocated.

In the present study message segments were determined to be in the correct order, but are of unknown distance from each other, and from the subject's own original attitude position. Thus, the magnitude of discrepancy between items may vary considerably. It would seem intuitively that breaking the total amount of discrepancy into roughly equal steps would be the most effective for increasing attitude change. Any sizeable deviation from this might reduce the amount of attitude change in the desired direction by making some of the intervals excessively large.

Another benefit of more exact scaling of the segments would be to locate the first message segment a known and not excessive magnitude of discrepancy from the subject's own position. Since the subjects would vary as to their own original attitude positions, either a compromise beginning

point would have to be found for the first segment at a magnitude of discrepancy not too great (i.e., not falling into the latitude of rejection) for any of the subjects; or alternatively, different series of messages could be used for different subjects, depending on their original attitude positions. To achieve this, interval level scaling would have to be done with both the message items, and the original position of the subjects.

It seems that magnitude of discrepancy would interact with a number of other factors, perhaps most importantly with the time between segments. Other factors with which it seems likely that magnitude of discrepancy of the message segment would interact would be the complexity of the arguments given, the credibility of the source, how ego involving the issue is for the receivers, intelligence and personality factors in the receivers.

Time also seems to be an important variable for future research. Although the differences between the three groups in the pilot study did not reach statistical significance, it should be noted that the two week delay treatment was less effective than the zero delay treatment, with the one week delay treatment considerably more effective than either. This suggests that attitude change may be curvilinealy related to the amount of time between segments. If this is true, then time becomes a very important variable.

Again, in this study the amount of time between segments was chosen arbitrarily. Additional research is needed to

vary the amount of time from perhaps a few minutes or hours through days and weeks. Time also could be expected to interact with many other factors, including degree of involvement, complexity, source credibility, and personality factors.

Future research should also measure attitude change at time intervals after the post test. It would be possible to argue that the effect found could either be intensified or be washed out in later measures. This could be a highly crucial measure to determine the usefulness of the findings.

A research design in which attitude change is measured after each message segment for both groups would yield valuable information about attitude change at intermediate steps. Unfortunately to measure attitude at so many points in time with the same two experimental groups would seem to invite strong interactions between the message and measurement. To avoid this, subjects would have to be randomly assigned to not less than eight good sized treatment groups, which would involve a very large number of subjects.

An associated question is the discrepancy of the position of the first message segment from the present position of the subject. Social Judgment Theory would suggest maximum change for a message that falls close to the receiver's latitude of rejection (Figure 1, p. 15). A problem, however, with a mass audience is that their present positions and latitudes of rejection might vary considerably, thus some research would need to be done to find a reasonable

compromise for a starting position.

Practical Applications

Although many questions remain unanswered at the present time the effect of dividing messages into segments and delivering them with time intervals between them seems to offer a great enough advantage in attitude change to make the technique useful for many practical applications.

Some differences between the practical situation and the experimental situation must be taken into account. Probabily the most important is that only subjects which had received all message segments were included in the tabulations. In a practical situation it generally could not be assumed that all audience members would receive or attend to all message segments. If the receiver got the early messages but not the later, it seems that he would be somewhat persuaded. However, if he were to receive the later message segments, but not the earlier, it is possible that there might be an even more severe boomerang than if he were given all message segments at one time, because he presumably would not have the benefit of many of the arguments on which the conclusions are based. A possible way to minimize this effect would be to make reference to the previous messages in the series, and briefly recapitulate earlier ones before giving the later ones.

If the messages were being disseminated by mass media, some consideration of the audience would be necessary.

Perhaps in the case of certain magazines or newspaper columns, or even radio programs it can be shown that a large segment of the audience reads or listens every day, week, or month, thus the likelihood of reaching a large percentage of the audience with the entire series would be high. Perhaps (for example in the case of radio or television) repeating a message segment several times would greatly improve the probability that the majority of the audience would hear each segment in a series (although some segments would be heard more than once).

This methodology would not be applicable to media that are received on a causal, once-in-a-while basis by large numbers of people, such as magazines sold largely on newsstands.

The communicator also would have to consider whether or not the medium he might use would make it possible for him to approach optimal time spacing of the message segments if future research demonstrates this factor to be as important as the pilot study seemed to indicate.

The technique was shown to be most effective for people who were highly ego involved. Thus, it presumably would not offer as much if any advantage to those selling tooth paste, etc., or most of the things commonly advertized in the mass media. Mass media have not, however, been found generally successful in inducing change in deeply ego involving attitudes. A notable example would be the increase in smoking

among young people in spite of a mass media campaign against it.[1] There seem to be reasons to believe that young people begin smoking for social reasons and reasons of self image more than because they initially receive real pleasure from the act of smoking itself. So this seems to be in many ways an ego involving issue. Perhaps issues of this nature would yield more successfully to this technique.

Conclusion Summary

The technique explored in this paper, that of dividing a message into segments and delivering these to subjects over time, was found to yield a statistically significant difference in attitude change as reflected in the subjects' predictions of future behavior, compared to giving all of the message segments at one time. The finding seems to have practical application. A number of important questions relating to the findings will require future research to find answers. Perhaps the most important of these is to determine if the attitude change differential measured immediately after the message exposure will persist to a significant degree over time.

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[1]One possible explanation for the lack of effectiveness of the anti-smoking campaign is the vast advertising campaigns of the cigarette manufacturers.

APPENDIX A

Pilot Study Pre- and Post-tests

APPENDIX A

Pilot Study Pre- and Post-tests

Name_____ Student No._____

INSTRUCTIONS

1. Below, on this page, there is a question and a set of nine possible answers. Please read them now.
2. Now that you have read the question and answers, please place an X in the blank by the answer that is most acceptable to you (mark only one please). When you have finished this, please go on to the next page.

QUESTIONS AND ANSWERS

How often should college students smoke marijuana?

____ Never (11)

____ About once or twice a year (12)

____ About three or four times a year (13)

____ About once a month (14)

____ About twice a month (15)

____ About once a week (16)

____ Two or three times a week (17)

____ About once a day (18)

____ More than once a day (19)

INSTRUCTIONS

This page contains the same question and answers as on the previous page. Please read them again, and this time please place an X before all of the answers that you find acceptable (mark as many as you wish).

QUESTION AND ANSWERS

How often should college students smoke marijuana?

____ Never (21)

____ About once or twice a year (22)

____ About three or four times a year (23)

____ About once a month (24)

____ About twice a month (25)

____ About once a week (26)

____ Two or three times a week (27)

____ About once a day (28)

____ More than once a day (29)

INSTRUCTIONS

Again this page contains the same question and answers as on the previous pages. As you read through this time please place an X before the answer that you find the most unacceptable (please mark one only).

QUESTION AND ANSWERS

How often should college students smoke marijuana?

____ Never (31)

____ About once or twice a year (32)

____ About three or four times a year (33)

____ About once a month (34)

____ About twice a month (35)

____ About once a week (36)

____ Two or three times a week (37)

____ About once a day (38)

____ More than once a day (39)

INSTRUCTIONS

This page again contains the same question and answers as on the three previous pages. As you read through this time please place an X before all of the answers that you find to be unacceptable (mark as many as you wish).

QUESTION AND ANSWERS

How often should college students smoke marijuana?

____ Never (41)

____ About once or twice a year (42)

____ About three or four times a year (43)

____ About once a month (44)

____ About twice a month (45)

____ About once a week (46)

____ Two or three times a week (47)

____ About once a day (48)

____ More than once a day (49)

APPENDIX B

Pilot Study Messages

APPENDIX B

Pilot Study Messages

Recent developments are causing scientists to rethink earlier pronouncements of marijuana as a relatively innocuous drug. Later information has demonstrated the drug to be more harmful than it was earlier presumed, causing researchers to caution heavy users of several potentially serious detrimental effects.

Among the findings:

Marijuana alters memory for short periods, hinders driving ability and causes respiration ailments similar to those suffered by tobacco smokers, according to Dr. Paul F. Consroe, a pharmacologist studying marijuana at the University of Arizona.

Consumer Reports magazine listed recent studies that concluded that marijuana could lower resistance to disease, increase birth defects, damage the lungs, and lead to sterility or impotence in men.

Although many researchers admit that the evidence against marijuana is not yet conclusive on all counts, most researchers now say that more caution should be exercised in the use of marijuana than earlier, more optimistic reports seemed to indicate.

(11)

"Marijuana may be dangerous," according to Dr. Ismet Karacan, a psychologist studying sleep, at Baylor College of Medicine.

"We have found that regular marijuana use suppresses deep sleep," he said. He described "regular" use as "about three cigarettes a week." Karacan said he has seen similar loss of deep sleep in cases of chronic schizophrenia, alcoholism, and depression. Persons lacking deep sleep also tend to show more pronounced effects of aging, such as loss of memory.

There is also recent evidence that chronic users are more susceptible to disease, including cancer. Dr. Robert Johnson, a biologist at the Texas Research Institute of Mental Sciences, said that he found that marijuana kills human white blood cells that fight bacteria in the body.

Johnson also found that marijuana retarded the growth of young bone marrow cells in rats. Bone marrow cells produce white blood cells. "This could be bad for chronic users," Johnson said. Most scientists at the Texas Research Institute of Mental Sciences agree that a chronic user would smoke an average of one marijuana cigarette a day.

Chronic use of marijuana interferes with mental functioning and sexual performance, and may cause sterility in males.

(12)

Dr. Ernest S. Barratt, a psychologist at the University of Texas medical school in Galveston, said that a group of chronic marijuana smokers could not discuss a given topic for as long as five minutes. Barratt said each smoker chose his topic, but 95 percent wandered off on tangents or changed the subject before the five minutes were up. "Then, when the researcher asked a smoker to return to the topic, the smoker forgot what he had said or forgot the topic altogether," Barratt said.

The Reproductive Bilogy Research Foundation in St. Louis, headed by William Masters and Virginia Johnson, the sex researchers, reported a study among 20 marijuana smokers and 20 non-users that showed the users had lower levels of the male hormone in the bloodstream. The study also showed that six users had low sperm counts and two complained of impotence. When one subject stopped using the drug he returned to potency.

Although low levels of the male hormone over long periods of time can have detrimental effects on mature males (such as development of breasts, sterility and impotence) the greater concern is for the male fetus in the early stages of pregnancy, where hormonal imbalance can seriously effect development. Dr. Jared Tinklenberg, assistant professor of psychology at Stanford University and a fellow of the Drug Abuse Council said, "It's stupid for a mother to use marijuana, particularly in the first three months of pregnancy when the risk (of fetal malformation) is greatest."

New research now confirms an earlier finding that marijuana can cause irreversible brain damage. This is the most serious charge leveled against the use of the drug, and leads to the conclusion that all marijuana use should be discouraged in the strongest possible terms.

In the original research it was found that parts of the brains of 10 chronic marijuana smokers were suffering from atrophy--or wasting away. This caused an effect similar to premature senility, lack of ability to concentrate on one subject, and interference with learning and remembering.

The original research was thrown into some confusion, however, when it was revealed that all 10 subjects had also used LSD. However, the original finding has now been supported by recent experiments by Dr. Robert Heath of Tulane University Medical School. He subjected rhesus monkeys to heavy doses of marijuana for months at a time, and found that they suffered "irreversible changes in brain function."

This new information, combined with other recent data suggests that the only reasonable course of action is to totally obstain from the use of marijuana.

APPENDIX C

Introductory Letters to Faculty Members and Students

APPENDIX C

Introductory Letters to Faculty Members and Students

June 4, 1976

Dear Faculty Member:

Thank you for helping me with this study. This is a part of my doctoral research, which I have high hopes of finishing this summer.

Enclosed herewith are envelopes for each one of your students. The envelopes each contain an introductory letter and a pre-test. Please pass them out to students and collect them when they are finished. You can return them to me via campus mail.

In the letter to the students I have asked them to please write down and remember their participant numbers. That is the number on the outside of the envelope. Each week they are to take the envelope with the same number on it. Since I have no other way of knowing that the same student gets each successive message in a series it is important to me that the students write down and/or remember the number, and take the envelope with the same number each week. (Perhaps you can just lay the envelopes out on a table and let the students select their own). It is just as important that they return the completed questionnaire in the same envelope.

As far as the purpose of the study is concerned, the less you say about this to the students the better, since it has been repeatedly demonstrated that students will try to "help out" a researcher by giving him the response they think he wants (demand characteristic). If possible please try to defer questions until the end of the study (end of the semester). At that time I would be glad to have any students contact me for information about the study. If any student does have questions about the study that won't wait, please put them in touch with me.

Office phone extension 304
Home phone 387-2220

It doesn't matter to me which day of the week you give out the envelopes, and it doesn't have to be the same day of every week, as long as it is done sometime during the week. It is important that each student participating get all 5 envelopes if possible, so perhaps you could give them on days when you have a high percentage of students present. If a student is not present on the day the envelopes are given out he could do it the next day he is present, if that is not too much trouble for you.

I will have each week's envelopes available for you at about the end of the preceding week. Again, thank you very much for your help. If you have any further questions, please call me. If you can't get in touch with me (I will be gone for about 10 days) contact Gil Whiteman, my chairman, and he will probably be able to answer it.

Sincerely,

Tom Nash
Assistant Professor
Department of Communication, UNH

UNIVERSITY OF NEW HAVEN
West Haven, Connecticut 06516

Dear Student:

I would like for you to help me in my doctoral dissertation research by evaluating a series of messages. You are free to do so or not as you choose, and whether or not you participate will make no difference in your grade for this class.

The messages will be given to you one per week over the next four weeks.

If you participate, it's important to do so seriously. Take time to read all instructions and messages carefully, and fill out evaluations and opinion forms thoughtfully.

You will be anonymous. Because no one will know who gave what answers, I hope you will be honest and candid in responding.

IMPORTANT: REMEMBER YOUR PARTICIPANT NUMBER. It is on the outside of the envelope you were given today. Write it down some place, perhaps in your wallet, or a notebook, where you can find it easily if you forget it. In each of the four weeks ahead please select the envelope with the same participant number. Always return the papers in the same envelope at the end of the class period.

May I ask one more favor? Please don't discuss the content of the messages with other students. The reason is because some students are receiving the messages in different order than you are, and I want to find out if the order makes any difference in how they are evaluated. I can't do that if you discuss the messages among yourselves. At the end of the study I will be happy to discuss any and all questions with any interested students.

Thanks in advance for your help.

Sincerely,

Tom Nash, Assistant Professor
Department of Communication

INSTRUCTIONS SUMMARY

1. Please fill out the forms enclosed herewith and return in the same envelope.
2. Write down your PARTICIPANT NUMBER someplace where you won't lose it.
3. Next week and on succeeding weeks find the envelope which corresponds to your PARTICIPANT NUMBER, read the message(s) and fill out the questionnaire.
4. Always return papers in the numbered envelope at the end of class.
5. Please do not discuss the content of the messages with other students until the end of the study.

APPENDIX D

Main Study Pre-test

APPENDIX D

Main Study Pre-test

INSTRUCTIONS

BELOW IS A LIST OF STATEMENTS OF OPINION. PLEASE READ THEM CAREFULLY, THEN MARK THEM AS FOLLOWS:

1. Draw a circle around the ONE statement you find MOST ACCEPTABLE to you, that is, the statement that comes closest to your own personal opinion.

2. Place the letter "A" in front of all other statements that are ALSO ACCEPTABLE to you.

3. Entirely CROSS OUT the ONE statement that is MOST UNACCEPTABLE to you, that is, the statement you most strongly disagree with.

4. Place the letter "U" in front of all other statements you also find UNACCEPTABLE.

5. If you find some statements neither particularly acceptable nor unacceptable, leave them blank.

OPINION STATEMENTS

____ Marijuana smoking is very enjoyable, and is also highly beneficial to the individual and to society. Since there is no danger in smoking it, I would strongly encourage everyone to smoke as often as possible. (11)

____ Marijuana gives great pleasure with no proven side effects. People should feel free to smoke it as often as they like. (12)

____ There may be some health hazard in smoking marijuana, but the benefits outweigh the hazards. (13)

____ Even if there is a health risk I think it is all right to smoke marijuana in moderation. (14)

____ I am neither in favor of, nor against smoking marijuana. (15)

____ Although I don't feel very strongly about it I think people would probably be better off if they did not smoke marijuana. (16)

____ I feel fairly strongly that marijuana is harmful and that people should not smoke it. (17)

____ Marijuana smoking is definitely a serious health hazard. (18)
The danger far outweighs any benefits. I am strongly opposed to smoking it and would be in favor of reasonable laws restricting its use.

____ Marijuana smoking is a great threat to the individual and (19)
society. I believe I should do what I can to influence other people not to use it. I would also be in favor of strict laws against its distribution and use.

APPENDIX E

Main Study Messages

APPENDIX E

Main Study Messages

(11)

MESSAGE

Recent developments are causing scientists to rethink earlier pronouncements that marijuana was a relatively innocuous drug. Later information has demonstrated the drug to be more harmful than it was earlier presumed, causing researchers to caution heavy users of several potentially serious detrimental effects.

Among the findings:

Marijuana alters memory for short periods, hinders driving ability, and causes respiration ailments similar to those suffered by tobacco smokers, according to Dr. Paul F. Consroe, a pharmacologist studying marijuana at the University of Arizona.

Consumer Reports magazine listed recent studies that concluded that marijuana could lower resistance to disease, increase birth defects, damage the lungs, and lead to sterility or impotence in men.

Although many researchers admit that the evidence against marijuana is not yet conclusive on all counts, most researchers now say that more caution should be exercised in the use of marijuana than earlier reports seemed to indicate.

EVALUATION

After you have read the above message, please respond to the statements below by circling the appropriate letters. SA = Strongly agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly disagree.

In general I found the message easy to understand.	SA	A	N	D	SD
The writing style was appropriate for the information given.	SA	A	N	D	SD
I had trouble understanding some of the words.	SA	A	N	D	SD
(Please circle any words you did not understand)					
The message seemed logically presented (this does not indicate that you either agree or disagree with the message).	SA	A	N	D	SD
I was NOT already aware of most of the facts presented.	SA	A	N	D	SD

(12)

MESSAGE

"Marijuana may be dangerous," according to Dr. Ismet Karacan, a psychologist studying sleep at Baylor College of Medicine.

"We have found that regular marijuana use suppresses deep sleep," he said. He described "regular" use as "about three cigarettes a week." Karacan said he has seen similar loss of deep sleep in cases of chronic schizophrenia, alcoholism, and depression. Persons lacking deep sleep also tend to show more pronounced effects of aging, such as loss of memory.

There is also recent evidence that chronic users are more susceptible to disease, including cancer. Dr. Robert Johnson, a biologist at the Texas Research Institute of Mental Sciences, said that he found that marijuana kills human white blood cells that fight bacteria in the body.

Johnson also found that marijuana retarded the growth of young bone marrow cells in rats. Bone marrow cells produce white blood cells. "This could be bad for chronic users," Johnson said. Most scientists at the Texas Research Institute of Mental Sciences agree that a chronic user would smoke an average of one marijuana cigarette a day.

EVALUATION

After you have read the above message, please respond to the statements below by circling the appropriate letters. SA = Strongly agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly disagree.

In general I found the message easy to understand.	SA	A	N	D	SD
The writing style was appropriate for the information given.	SA	A	N	D	SD
I had trouble understanding some of the words.	SA	A	N	D	SD
(Please circle any words you did not understand)					
The message seemed logically presented (this does not indicate that you either agree or disagree with the message).	SA	A	N	D	SD
I was NOT already aware of most of the facts presented.	SA	A	N	D	SD

(13)

MESSAGE

Chronic use of marijuana interferes with mental functioning and sexual performance, and may cause sterility in males.

Dr. Ernest S. Barratt, a psychologist at the University of Texas medical school in Galveston, said that a group of chronic marijuana smokers could not discuss a given topic for as long as five minutes. Barratt said each smoker chose his topic, but 95 percent wandered off on tangents or changed the subject before the five minutes were up. "Then, when the researcher asked a smoker to return to the topic, the smoker forgot what he had said or forgot the topic altogether," Barratt said.

The Reproductive Biology Research Foundation in St. Louis, headed by William Masters and Virginia Johnson, the sex researchers, reported a study among 20 marijuana smokers and 20 non-users that showed the users had lower levels of the male hormone in the bloodstream. The study also showed that six users had low sperm counts and two complained of impotence. When one subject stopped using the drug he returned to potency.

Although low levels of the male hormone over long periods of time can have detrimental effects on mature males (such as the development of breasts, sterility and impotence) the greater concern is for the male fetus in the early stages of pregnancy, where hormonal imbalance can seriously effect development. Dr. Jared Tinklenberg, assistant professor of psychology at Stanford University and a fellow of the Drug Abuse Council said, "It's stupid for a mother to use marijuana, particularly in the first three months of pregnancy when the risk (of fetal malformation) is greatest."

EVALUATION

After you have read the above message, please respond to the statements below by circling the appropriate letters. SA = Strongly agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly disagree.

In general I found the message easy to understand. SA A N D SD

The writing style was appropriate for the information given. SA A N D SD

I had trouble understanding some of the words. SA A N D SD

(Please circle any words you did not understand)

The message seemed logically presented (this does not indicate that you either agree or disagree with the message). SA A N D SD

I was NOT already aware of most of the facts presented. SA A N D SD

(14)

MESSAGE

There can no longer be any doubt that smoking marijuana causes irreversible brain damage. Therefore marijuana should not be smoked at all under any circumstances, and new federal legislation should be passed greatly strengthening the penalties for the sale and possession of even small quantites of the drug.

In the original research in which brain damage was found it was discovered that the brains of 10 chronic marijuana users were suffering from atrophy (wasting away). This caused an effect similar to premature senility, lack of ability to concentrate on one subject and interference with learning and remembering.

As strong as the evidence is it was doubted by some when it was discovered that all 10 subjects had also used LSD. They believed that the brain damage could have been caused by the LSD. However, the original finding that the brain damage was caused by marijuana has recently been supported in experiments by Dr. Robert Heath of Tulane University Medical School. He subjected monkeys to heavy doses of marijuana and found that they suffered "irreversible changes in brain function."

So there is no longer any doubt that marijuana use does cause irreversible brain damage. With this evidence it is now the responsibility, even the duty, of responsible citizens to do everything possible to remove this dangerous drug from use in our society. This should include extensive public information campaigns, stiff penalties for possession, mandatory jail sentences for marijuana dealers, and a major expenditure to police forces for enforcing anti-drug laws.

Every responsible person, every man or woman who cares about the future of this country and its young people, will join the fight against marijuana. Write to your congressman demanding tougher laws. Report marijuana possessors and dealers to the proper authorities. Discuss the issue on radio call-in programs. Write to the editor of your newspaper. Tell your friends and neighbors. The marijuana evil can and must be defeated.

EVALUATION

After you have read the above message, please respond to the statements below by circling the appropriate letters. SA = Strongly agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly disagree.

In general I found the message easy to understand. SA A N D SD

The writing style was appropriate for the information given.	SA	A	N	D	SD
I had trouble understanding some of the words.	SA	A	N	D	SD
(Please circle any words you did not understand)					
The message seemed logically presented (this does not indicate that you either agree or disagree with the message).	SA	A	N	D	SD
I was NOT already aware of most of the facts presented.	SA	A	N	D	SD

(21)

MESSAGE

Two states, Vermont and Oregon, have passed bills making it illegal to sell beer and soft drinks in non-returnable containers. These laws have significantly reduced the amount of roadside litter in both states. For example, in Oregon, according to Applied Decisions Systems, a Massachussets research firm, beer and soda bottle roadside trash declined by 76 percent, and all litter by 33 percent.

Not only would passage of such a bill in Connecticut greatly reduce the cost of removing roadside litter, it would also save money for the consumer. In 1972 the president of Coca-Cola, USA., told Congress: "Coke sold in food stores in non-returnable packages is priced, on the average, 30 to 40 percent higher than in returnable bottles." Why? Soft drink cans cost about seven cents each. The Pepsi-Cola franchiser in Portland, Oregon, figures that using refillable bottles again and again reduces the container cost per filling to less than a penny, compared with four to seven cents for throw-aways.

The chief opponent of the "bottle bill" is, not surprisingly, manufacturers of the disposable bottles and cans. In most states where the issue has come to a vote these interests have spent large sums of money fighting the bill.

EVALUATION

After you have read the above message, please respond to the statements below by circling the appropriate letters. SA = Strongly agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly disagree.

In general I found the message easy to understand.	SA	A	N	D	SD
The writing style was appropriate for the information given.	SA	A	N	D	SD
I had trouble understanding some of the words.	SA	A	N	D	SD
(Please circle any words you did not understand)					
The message seemed logically presented (this does not indicate that you either agree or disagree with the message).	SA	A	N	D	SD
I was NOT already aware of most of the facts presented.	SA	A	N	D	SD

(22)

MESSAGE

It may come as a surprise that Americans now use about 60 billion throw-away beverage containers per year. This is about 285 per year for every man, woman, and child in the country. These cans and bottles cost us money by adding some nine million tons to our garbage yearly, consuming vast quantities of basic materials to manufacture, adding almost 60 dollars per year to the average family's food bill.

Unfortunately, more than two billion of these containers yearly find their way to the nation's roadsides, where they contribute to the growing problem of roadside trash, and ultimately cost us money again, this time for removal and disposal.

How can we avoid these costs? We can pass laws in our states making it illegal to sell beverages in non-returnable bottles and cans. Most consumers do not feel it is a great inconvenience. A survey in Oregon, where such as law has been in effect for several years, found that only 12 percent felt it was inconvenient to pay deposits and return empty bottles.

EVALUATION

After you have read the above message, please respond to the statements below by circling the appropriate letters. SA = Strongly agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly disagree.

In general I found the message easy to understand.	SA	A	N	D	SD
The writing style was appropriate for the information given.	SA	A	N	D	SD
I had trouble understanding some of the words.	SA	A	N	D	SD
(Please circle any words you did not understand)					
The message seemed logically presented (this does not indicate that you either agree or disagree with the message).	SA	A	N	D	SD
I was NOT already aware of most of the facts presented.	SA	A	N	D	SD

(23)

MESSAGE

One-way containers, beer and soft drink bottles and cans that can not be refilled, are costly, create unnecessary roadside rubbish, but perhaps even more importantly, constitute a distinct health hazard. For example, a 1975 California study put that state's current litter injuries at 300,000 per year. The predominant causes: broken beer and soft drink bottles, and pull-tab openers from cans. A stroll on any Connecticut beach is enough to convince a person that the problem is indeed serious.

However, a five cent deposit on the bottle is enough to convince most people that it is better to return than to discard. For those who would throw the bottles away there are any number of eager young men and women willing to rescue the bottle and collect the reward.

Obviously it is not to the best short term interests of those who make bottles to have them used more than once, but it can be clearly demonstrated that it is in the best long range interests of all of us to pass bills requiring multiple use containers to be used. Ask the people who have tried it! "Overwhelming" is virtually the only word to describe Oregon's approval of the bottle bill. Nine in ten people (91 percent) said they approved, and only one in 20 voiced any disapproval at all.

EVALUATION

After you have read the above message, please respond to the statements below by circling the appropriate letters. SA = Strongly agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly disagree.

In general I found the message easy to understand.	SA	A	N	D	SD
The writing style was appropriate for the information given.	SA	A	N	D	SD
I had trouble understanding some of the words.	SA	A	N	D	SD
(Please circle any words you did not understand)					
The message seemed logically presented (this does not indicate that you either agree or disagree with the message).	SA	A	N	D	SD
I was NOT already aware of most of the facts presented.	SA	A	N	D	SD

APPENDIX F

Main Study Post-test

APPENDIX F

Main Study Post-test

INSTRUCTIONS

BELOW IS A LIST OF STATEMENTS OF OPINION. PLEASE READ THEM CAREFULLY, THEN MARK THEM AS FOLLOWS:

1. Draw a circle around the ONE statement you find MOST ACCEPTABLE to you, that is, the statement that comes closest to your own personal opinion.

2. Place the letter "A" in front of all other statements that are ALSO ACCEPTABLE to you.

3. Entirely CROSS OUT the ONE statement that is MOST UNACCEPTABLE to you, that is, the statement you most strongly disagree with.

4. Place the letter "U" in front of all other statements you also find UNACCEPTABLE.

5. If you find some statements neither particularly acceptable nor unacceptable, leave them blank.

OPINION STATEMENTS

____ Marijuana smoking is very enjoyable, and is also highly beneficial to the individual and to society. Since there is no danger in smoking it, I would strongly encourage everyone to smoke it as often as possible. (11)

____ Marijuana gives great pleasure with no proven side effects. People should feel free to smoke it as often as they like. (12)

____ There may be some health hazard in smoking marijuana, but the benefits outweigh the hazards. (13)

____ Even if there is a health risk I think it is all right to smoke marijuana in moderation. (14)

____ I am neither in favor of, nor against smoking marijuana. (15)

____ Although I don't feel very strongly about it I think people would probably be better off if they did not smoke marijuana. (16)

____ I feel fairly strongly that marijuana is harmful and that people should not smoke it. (17)

____ Marijuana smoking is definitely a serious health hazard. The danger far outweighs any benefits. I am strongly opposed to it and would be in favor of reasonable laws restricting its use. (18)

____ Marijuana smoking is a great threat to the individual and society. I believe I should do what I can to influence other people not to use it. I would also be in favor of strict laws against its distribution and use. (19)

Below are a series of sets of descriptive words about marijuana smoking. Each set has two opposite descriptive words with a series of spaces between. Please check the blank which comes closest to your own personal opinion on each set.

For example, if your opinion is about half way between the two descriptive words, check the middle blank. If your opinion is closer to one than to the other, put your check closer to that word. How close your check mark is to either word depends on how close that word comes to describing your opinion.

Marijuana smoking is:

Weak___:___:___:___:___:___:___Strong (31)

Pleasant___:___:___:___:___:___:___Unpleasant (32)

Safe___:___:___:___:___:___:___Dangerous (33)

Detrimental___:___:___:___:___:___:___Beneficial (34)

Sociable___:___:___:___:___:___:___Antisocial (35)

Unhealthy___:___:___:___:___:___:___Healthy (36)

Morally right___:___:___:___:___:___:___Morally wrong (37)

Dumb___:___:___:___:___:___:___Smart (38)

Exciting___:___:___:___:___:___:___Dull (39)

Bad___:___:___:___:___:___:___Good (40)

Please estimate the number of times you will probably smoke marijuana in the next four weeks. (Total for four weeks)

_____times (45-47)

Dear student:

Thanks very much for your help. Now that the study is complete I would be happy to answer any questions about the study (it will be several weeks, however, before the results are tabulated). Please feel free to call me or come by my office.

Just one more thing. Some of you may have filled out two sets of questionnaires (because you happen to be enrolled in two different classes where the questionnaires were given out). If so, please indicate the OTHER PARTICIPANT NUMBER here_____. Also, if you had previously cooperated in a similar study which I conducted this past spring, please indicate that by checking here_____.

Again, thanks!

Tom Nash

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