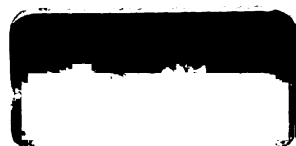




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## ABSTRACT

### THE RELATIONSHIP BETWEEN ADVOCATED AND OBTAINED ATTITUDE CHANGE

By

Michael E. Roloff

An area of communication that has drawn considerable research is that of the relationship between the amount of change advocated in a message and the amount of change obtained. There have been three major theoretical perspectives used to make predictions about that relationship. While each of the perspectives makes a clear prediction about the nature of the relationship, the research using these predictions has produced inconsistent findings. The purposes of this thesis were four in number: (1) to examine the three current explanations of the relationship between the amount of change advocated and the amount of change obtained; (2) to provide arguments for a different explanation; (3) to test the empirical validity of the new explanation; and (4) to discuss the implications of this research on the new theory, the practical application of the findings, methodological and additional research implications.

Five hypotheses concerning the relationship between the amount of change advocated and the amount of change obtained were derived from an early formulation of Woelfel's Linear Force Aggregation Theory.



These hypotheses were tested using a longitudinal design. This design included five observations and three messages over a five week period. The subjects in this study were Communication 100 students at Michigan State University.

Two of the five hypotheses were supported. A correlational analysis and an analysis of variance indicated that the relationship was positive linear when dealing with velocity and negative linear when dealing with acceleration. Inertial mass was not shown to be a significant resistor to acceleration. In addition, only the first of three messages showed a significant amount of attitude change.

THE RELATIONSHIP BETWEEN ADVOCATED  
AND OBTAINED ATTITUDE CHANGE

By

Michael E. Roloff

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## CHAPTER I

### INTRODUCTION

An area of communication that has drawn considerable research is that of the relationship between the amount of change advocated in a message and the amount of attitude change obtained. Research in this area began in the 1930s and has continued into the 1970s. In fact, since 1933 some 53 studies have been reported (see Insko, 1967; Kiesler, Collins, and Miller, 1969; and Whittaker, 1967, for complete listings of these studies).

It would seem that after such a wealth of research has been conducted in this area, few questions would be left unanswered. Unfortunately, few questions concerning the relationship have been answered. Three conflicting results have created much controversy in the area. Fifteen researchers have found the relationship to be a positive linear function, i.e., as the amount of change advocated increases the amount of attitude change obtained increases (Bergin, 1962; Aronson, Turner, and Carlsmith, 1963; Bochner and Insko, 1966; Zimbardo, 1960; Rosenbaum and Franc, 1960; Harvey, Kelley, and Shapiro, 1958; Goldberg, 1958; French, 1956; Fisher, Rubenstein, and Freeman, 1956; Tuddenham, 1958; Fisher and Lubin, 1958; Helson, Blake, and Mouton, 1958; Hovland and Pritzker, 1957; Gorfein, 1963; and Johnson and Steiner, 1968).

Seven other researchers have found the relationship to be a negative linear relationship, i.e., as the amount of change advocated increases the amount of change obtained decreases (boomerang effect) (Cohen, 1959; Cohen, 1962; Miller and Levy, 1967; Kelley and Volkhart, 1952; Abelson and Miller, 1967; Hovland, Harvey, and Sherif, 1958; and Johnson and Steiner, 1968).

Still nine other researchers have found the relationship to be curvilinear, i.e., as the amount of change advocated increases the amount of attitude change obtained increases and then decreases (Aronson, Turner, and Carlsmith, 1963; Bochner and Insko, 1966; Brewer and Crano, 1969; Freedman, 1974; Insko, Murashima, and Saiyadain, 1966; Johnson, 1966; Whittaker, 1965; and Peterson and Koulack, 1969).

This thesis will attempt to examine some of the unresolved issues in this area. It will (1) examine three current explanations of the relationship between the amount of change advocated and the amount of attitude change obtained; (2) provide arguments for a different explanation; (3) test the empirical validity of the new explanation; and (4) discuss the implications of this research to previous research and subsequent research.

### Prior Explanations

Three explanations have been advocated for the relationship between the amount of change advocated in a message and the amount of attitude change obtained. Researchers have argued for dissonance theory, group norm theory, and the social judgment approach.

## Dissonance Theory

A psychological explanation arises from the theory of cognitive dissonance as formulated by Festinger (1957) and interpreted by Festinger and Aronson (1960). Dissonance theory assumes that when a person has two or more cognitions that are inconsistent, that person will feel dissonance or psychological tension. This tension produces discomfort which prompts the individual to attempt to reduce it. The degree of dissonance is thought to vary with four factors.

First, the credibility of the source of conflicting information affects the level of dissonance. When a person perceives that he holds an attitude which is different from that of a high credible source, his dissonance will increase as the discrepancy between the two positions increases. When the source is only mildly credible, the amount of dissonance will increase at a slower rate as the discrepancy between the two positions increases.

Second, the amount of discrepancy between the amount of change advocated in the message and the individual's current attitude affects the level of dissonance. As the amount of discrepancy between the message and the person's attitude increases, dissonance increases.

Third, the personal importance of the topic affects the level of dissonance. If the person perceives a great difference between his position and another's on an important issue he will experience more dissonance. If the issue is relatively unimportant, little dissonance will be produced until the level of discrepancy is very large.



Fourth, the ambiguity of the message topic affects the level of dissonance. As message topic ambiguity decreases and the discrepancy between the message position and the receiver's position increases, dissonance will increase. In general, dissonance produced from a belief-discrepant message tends to increase at a faster rate for unambiguous topics than for ambiguous topics.

Given these four factors producing dissonance, the person may reduce it in four ways. First, the person may alter his position to bring it closer to the communicator's. This is the method of dissonance reduction desired in most attitude change studies. Second, the person may attempt to alter the communicator's position to bring it closer to his own. This method of dissonance reduction is generally controlled in attitude change studies by blocking feedback from the receiver to the source. Third, the person may seek social support or cognitive support for his own position. Most attitude change studies have dealt with this by prohibiting subjects from talking with each other. Unfortunately, it is impossible to control for the subject who self-produces arguments to bolster his own position. Indeed, Cohen (1962) has argued that this production of mental support for one's own position produces a negative linear relationship between the amount of change advocated and the amount of change obtained (boomerang effects). His own research and the research of Brock (1967) tend to support this prediction. Finally, the person may derogate the credibility of the source. The derogation of the source of a message has been found in some studies (Bochner and Insko, 1966) and not in others (Aronson, Turner, and Carlsmith, 1963).

The research conducted in dissonance theory has yielded conflicting results. When looking at the relationship between the amount of change advocated and the amount of change obtained as it is influenced by source credibility, three studies have found a positive linear relationship (Bergin, 1962; Aronson, Turner, and Carlsmith, 1963; and Bochner and Insko, 1966). Some of the same studies also found curvilinear relationships (Aronson, Turner, and Carlsmith, 1963; and Bochner and Insko, 1966) plus one additional study found only a curvilinear relationship (Brewer and Crano, 1969). When looking at the importance of the topic to an individual or the person's involvement with the topic, one study found that as the involvement increases the relationship is linear (Zimbardo, 1960) and another study found that as involvement increased the relationship became curvilinear (Freedman, 1964). One study looked at the effect of the ambiguity of the message on the relationship and found a curvilinear relationship (Insko, Murashima, and Saiyadain, 1966). Three studies have found a negative linear relationship (Cohen, 1959; Cohen, 1962; and Miller and Levy, 1967). Thus, the most frequent finding in the dissonance literature is that of a curvilinear relationship (five studies), followed by a positive linear relationship (four studies) and a negative linear relationship (three studies).

This psychological explanation has provided no clear answer to the nature of the relationship between the amount of change advocated in a message and the amount of attitude change obtained. While the dissonance approach has conceptually attempted to indicate what the relationship should be, the empirical results are contradictory.

### Group Norm Theory

A second explanation is a sociological approach. Two approaches have been taken in the area of normative theory in order to investigate the relationship between the amount of change advocated and the amount of change obtained. These approaches are (1) normative resistance to change, and (2) group communication to produce conformity.

The first approach is that of resistance to change of individual attitudes that are anchored in group norms. Group norms may operate through an internal or external mechanism in order to reduce deviancy. First, a group member may have internalized a group norm to the extent that the strength of his position lies within himself. He in essence becomes the primary enforcer of the group norm for his own behavior. Second, a person may not have internalized the group norm but may feel compelled to conform to it because of sanctions the group may apply to deviants. The sociological approach has been primarily interested in the latter external enforcer of group norms (Kelley and Volkhart, 1952).

This perspective has identified two variables that will influence the amount of pressure the group may exert through rewards and punishments on deviants. The first is the openness of the deviancy from group norms. If the person privately deviates from the norm the likelihood of being sanctioned is small. Thus, a message asking for a private change will meet less resistance than a message asking for a public observable change. In this case, if the message asks for a private change the relationship between amount of advocated change and amount of obtained change may be positive and linear. If the

message asks for a public change the relationship may be negative linear or curvilinear. The second variable is the value the person puts on his membership in the group. If the person perceives that many of his needs are satisfied by the group, the likelihood of him deviating from the group norm and prompting negative sanctions is small. Thus, when group membership is important, resistance to attitude change ought to be higher than when group membership is less important. The relationship between the amount of change advocated in a message and the amount of obtained change ought to be positively linear when group membership is not valued highly and either curvilinear or negative linear when group membership is highly valued.

Two studies have investigated normative resistance to change and they have produced contradictory results. Kelley and Volkhart (1952) confirmed findings of negative linear relationships when deviancy from group norms were advocated. However, Rosenbaum and Franc (1960) found general positive linear relationships in attitude change when deviancy from group norms were advocated.

The second aspect of the group norm approach is that of the impact of group communication on the individual's change in attitude. This approach has investigated the person's reaction to negative information from others about himself or other objects. It is argued in this position that pressure is brought to bear on a group member to conform to the judgment of other members. This pressure causes the person to react in some way that will reduce it. Three variables have been identified as important in determining the person's reaction to negative information of his own deviancy. First, the initial attitude

of the receiver toward the sources of negative information about himself affects the person's reaction. If the receiver evaluates the source as being low credible then little change is observed and the relationship between the amount of change advocated and the amount of change obtained becomes negatively linear. If the receiver evaluates the source as being high credible the relationship becomes linear. Second, the amount of discrepancy between the message and the receiver's position makes a difference in the receiver's reaction. Third, the number of persons disagreeing with the receiver makes a difference in the amount of change obtained. As the number of people disagreeing with the receiver increases so does the amount of attitude change.

Three studies have investigated the effect of negative information about oneself and each has resulted in different findings. Harvey, Kelley, and Shapiro (1958) found a positive linear relationship between the amount of change advocated by a group and the amount of change obtained. Abelson and Miller (1967) observed a negative linear relationship, and Johnson (1966) observed a curvilinear relationship.

Six studies investigated the persons' reaction to the discrepancy between his own position and a group judgment and all found a positive linear relationship between the amount of change advocated by the group and the amount of change obtained (Goldberg, 1954; French, 1956; Fisher, Rubenstein, and Freeman, 1956; Tuddenham, 1958; Fisher and Lubin, 1958; and Helson, Blake, and Mouton, 1958).

Thus, the findings in the sociological approaches are diverse and at times contradictory.

### Social Judgment Approach

The social psychological explanation was first posited by Sherif and Hovland (1961) and further developed by Sherif, Sherif, and Nebergall (1965). This perspective represents a mixture of psychological variables (internal attitudinal structures) with sociological variables (individual adherence to group norms or ego involvement). The social judgment approach views a person's attitude toward an object as consisting of three ranges of positions that define a person's stance toward an object. The first is the latitude of acceptance or the range of positions taken toward an object that person finds acceptable (including the most acceptable position). The second is the latitude of rejection or the range of positions taken toward an object that the person finds objectionable (including the most objectionable position). The final one is the latitude of noncommitment in which the person perceives positions that he neither accepts or rejects.

If a communication advocates a point of view that falls within the latitude of acceptance an assimilation effect will occur; i.e., the individual will perceive the communication as advocating a position more closely related to his own than it actually is and will evaluate it favorably. If a communication advocates a point of view that falls within the latitude of rejection a contrast effect will occur; i.e., the individual will perceive the communication as advocating a position more extreme than his own and will negatively evaluate it. If the communication falls within the latitude of noncommitment, neither assimilation nor contrast will occur.



Given the assimilation effects in the latitude of acceptance and the contrast effects in the latitude of rejection, the amount of change advocated in a message has an important effect on attitude change. If the communication falls in the latitude of acceptance then the relationship is a positive linear function. As the communication moves into the latitude of rejection the amount of change levels off and becomes negative. Thus, the overall relationship is curvilinear.

The social judgment approach indicates that the relationship will be influenced by the degree of importance the receiver of a message attaches to an attitude. In other words, the degree to which a person is ego involved with an attitude or issue will affect the person's response to a belief-discrepant message. This effect is primarily one of influencing a person's status in some group.

Sherif, Sherif, and Nebergall (1965) write about its impact on attitude change:

It is altogether a different, and even a contradictory, emphasis to argue that an individual will restore his stability by giving up his position near and dear to him as a family member, a member of a social group, an intellectual clique, or a religious sect just because he feels situational discomfort to a discrepant communication.<sup>1</sup>

Theoretically, three factors indicate the degree of involvement a person feels with a topic. First, high involvement is perceived to be an increase in the latitude of rejection with a decrease in the latitude of noncommitment and acceptance. Low involvement is the opposite. Second, ego involvement has been thought to be indicated by

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<sup>1</sup>Carolyn Sherif, Muzafer Sherif, and Roger Nebergall, Attitude and Attitude Change: The Social Judgment-Involvement Approach (Philadelphia: W. B. Saunders, 1965), p. 228.

membership in a group that is known to perceive a given topic as being important (alcoholism and the Women's Christian Temperance Union). Third, ego involvement is thought to be indicated by taking an extreme position on a given issue.

In terms of the relationship between the amount of advocated change and the amount of attitude change obtained, it is predicted that for low ego involving attitudes the relationship will be a positive linear function. For high ego involving topics the relationship is thought to be a negative linear function. In general, the relationship is predicted to be curvilinear.

The research in this area has also been contradictory. Three studies have found the relationship to be a positive linear function (Hovland and Pritzker, 1957; Gorfein, 1963; and Johnson and Steiner, 1968). Two studies have found the relationship to be a negative linear function (Hovland, Harvey, and Sherif, 1958; and Johnson and Steiner, 1968) and three studies have found the relationship to be curvilinear (Whittaker, 1963; Whittaker, 1965; and Peterson and Koulack, 1969).

It would appear that none of the three prior explanations is superior in providing consistent findings. Figure 1 indicates a summary of the explanations, the significant variables involved in each, the major prediction of the form of the relationship, and the findings of studies attempting to specify the relationship.

In the next section of this chapter, I will argue for a different explanation for the relationship between the amount of change advocated and the amount of change obtained.

Figure 1.--Prior Explanations: Predictions and Results.

Perspective	Cognitive Dissonance Theory	Group Norm Theory		Social Judgment Approach
		Normative Resistance to Change	Group Communication to Produce Conformity	
Variables affecting relationship between amount of change advocated and the amount of attitude change obtained	<ol style="list-style-type: none"> <li>1. Credibility</li> <li>2. Involvement</li> <li>3. Discrepancy-dissonance</li> <li>4. Ambiguity of issue</li> </ol>	<ol style="list-style-type: none"> <li>1. Openness required in attitude change</li> <li>2. Value of group membership to individual</li> </ol>	<ol style="list-style-type: none"> <li>1. Attitude toward source</li> <li>2. Degree of discrepancy between the two positions</li> <li>3. Size of the group</li> </ol>	<ol style="list-style-type: none"> <li>i. Latitudes of: (a) acceptance (b) rejection (c) noncommitment</li> <li>2. Ego involvement</li> <li>3. Size of discrepancy between the two positions</li> </ol>
Predicted relationship	Linear	Curvilinear or negative linear	Positive linear	Curvilinear
Studies showing a positive linear relationship	Bergin, 1962; Aronson, Turner, & Carlsmith, 1963; Bochner & Insko, 1966; Zimbardo, 1960	Rosenbaum & Franc, 1960	Harvey, Kelley, & Shapiro, 1958; Goldberg, 1954; French, 1956; Fisher, Rubenstein, & Freeman, 1956; Tuddenham, 1958; Fisher & Lubin, 1958; Helson, Blake, & Houton, 1958	Hovland & Pritzker, 1957; Gorfein, 1963; Johnson & Steiner, 1968
Studies showing a curvilinear relationship	Aronson, Turner, & Carlsmith, 1963; Bochner & Insko, 1966; Brewer & Crano, 1969; Freedman, 1964; Insko, Murashima, & Saiyadain, 1966		Johnson, 1966	Whittaker, 1963; Whittaker, 1965; Peterson & Koulak, 1969
Studies showing a negative linear relationship	Cohen, 1959; Cohen, Miller & Levy, 1967	Kelley & Volkhart, 1952	Abelson & Miller, 1967	Hovland, Harvey, & Sherif, 1958; Johnson & Steiner, 1968

### Linear Force Aggregation Theory

An alternative approach to explaining the relationship between the amount of change advocated in a message and the amount of attitude change obtained deals with the amount of information a person has about a topic and the information sent to the individual in a message. The information model we will use will be a linear model that views an attitude as an information structure that indicates a person's relationship to an object. It was developed by Woelfel (1972) and is called Linear Force Aggregation Theory. The model makes three assumptions about the relationship between the amount of change advocated in a message and the amount of change obtained: (1) an attitude is a function of the value of all messages received about a topic; (2) attitude change is a positive linear function of the amount of discrepancy that exists between a person's position and the message position and the number of messages received advocating a given position; (3) the amount of information a person has received about a topic acts as a resistor to attitude change.

Such an explanation would primarily focus on information as opposed to internal processes such as cognitive dissonance or external processes such as group pressure. In essence, such an approach would focus on communication as the key construct. Exploring an information or communication explanation would provide three advantages: (1) on the basis of previous success in other related areas, an information model will be useful in discussing the relationship between the amount of change advocated and the amount of change obtained; (2) an information model will be parsimonious; and (3) an information model will be easy to operationalize.

The first advantage is the relative success of the information explanation in predicting attitudes and behaviors.

As is obvious from Figure 1 the dissonance approach has provided inconsistent findings. Two studies investigating the influence of the respondent's involvement with the topic have found different results. Zimbardo (1960) found a linear relationship even in highly involved subjects between the amount of advocated change and the obtained change. Freedman (1964) found a curvilinear relationship regardless of the level of the subject's involvement with the topic. When looking at the relationship under various degrees of credibility we find the explanation to be more more satisfying. Insko (1966) wrote,

This does not mean that dissonance theory is able to handle all of the existing data. Bochner and Insko (1966) correlational results for example make it appear as if disparagement (of source) is not a complete explanation for a decreasing influence curve.<sup>2</sup>

Thus, it would seem that dissonance theory has not provided a totally satisfactory explanation of the relationship.

The group approach also has provided us with conflicting results, although not to the extent of dissonance theory. Figure 1 does indicate that positive linear (six studies) and negative linear (one study) results have been found using this approach.

The social judgment approach also has produced inconsistent findings. Figure 1 indicates that it has provided us with different

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<sup>2</sup>Chester Insko, Theories of Attitude Change (New York: Appleton-Century-Crofts, 1967), p. 85.

kinds of relationships. Wilmot (1971) found an extremely low effect of ego involvement on attitude change. He wrote:

. . . the best combination of predictors of attitude change toward the belief-discrepant message are (1) the number of categories used on the own categories method; (2) self-report of personal importance of the topic and (3) extremity of pre-test position on the topic. The remaining independent variables each accounted for less than one per cent of the remaining common variances in the attitude change series. In all only five per cent of the attitude change toward the persuasive messages is accounted for by all the independent variables acting together. And while the own categories measure ego involvement accounts for more variance than any other variable, the correlation between the number of categories and attitude change is in the opposite direction from the theoretical prediction.<sup>3</sup>

It would seem that this position has prediction problems also.

No attempt has been made to apply the information model to investigate the relationship between the amount of advocated change and the amount of attitude change obtained. In other areas the information model has had great success. Using a linear information model that assumes a person's attitude will converge on the mean value of all incoming messages, Woelfel and Haller (1970) accounted for 64% of the variance in high school student's educational aspirations, primarily on the basis of the average educational expectations of their significant others. Mettlin (1970) replicated these results on another sample with the same success. Woelfel and Hernandez (1970) accounted for 86% of the variance in the usage of marijuana using a linear information model. These results have been extended

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<sup>3</sup>William Wilmot, "A Test of the Construct and Predictive Validity of Three Measures of Ego-Involvement," Speech Monographs (1971), p. 222.



to topics such as the attitudes toward French Canadian Separatists (Woelfel, et al., 1974), cigarette smoking (Mettlin, 1970), and the extent to which children perceived television as real or fantasy (Reeves, 1974). While there may be instances when the model will not present such impressive results, its utility seems widespread so far. Hopefully, the relationship between the advocated change and obtained change will be as fruitful.

The second advantage is that an information or communication explanation would be parsimonious. Parsimony is desirable for the scientist since it allows him to investigate many complex phenomena by expanding upon a few basic propositions. Instead of arguing from a structure which is very complex and at times makes unclear or contradictory predictions, it would be better to argue from a few basic propositions that could be built upon.

The most basic proposition dealing with the relationship between the amount of change advocated in a message and the amount of attitude change obtained is one that deals with information. If one examines the three explanations of the relationship described previously, the one common thread that runs through all of them is that of information.

In the cognitive dissonance approach, the key construct is that of psychological tension or dissonance. However, the production of dissonance is the result of being impacted with a message that is discrepant from your own position. While it is never empirically supported that dissonance increases as the amount of change advocated in a message increases, it is found that as the discrepancy increases

some amount of attitude change results. In other words, while no empirical support exists for the premise that as discrepancy increases so increases dissonance, support does exist that the discrepancy produces some amount of attitude change (either in a positive or negative direction). The most basic premise seems to be the one that relates information or the amount of advocated change to attitude change.

In the group norm approach little has been done to investigate the pressure to change felt by a person who finds himself in conflict with a group norm. It would seem that it would be important to investigate the pressure emanating from the group, since this pressure is assumed to cause the individual group member to react in a given manner to incoming information. In the research reviewed no attempt has been made to find if that pressure exists and if it increases as the person deviates from the group norm. Given this lack of support for the premise that group pressure acts as an influence on a person's propensity to change his attitude, it seems that it is not the most basic premise. The research has found that as the amount of deviation increases, some amount of attitude change occurs (either in a positive or negative direction). It seems that the most basic premise is the one that relates the amount of change advocated to the amount of change obtained.

The social judgment approach has investigated ego involvement and its relationship to attitude change. Unfortunately, the validity of the measures of ego involvement is somewhat suspect. Four operational definitions of ego involvement have been posited. First, the

width of the latitude of rejection and the latitude of noncommitment have been used as indicators of the individual's involvement with the topic. Unfortunately, we are not sure that this is really measuring ego involvement. These widths may be artifacts of the scaling procedures used so that when the scales were expanded we might find that individuals' latitude sizes are not different. In essence, the widths of the latitudes may be due to ceiling and floor effects. Second, belonging to a group known to be involved with a topic is thought to be an indicator of ego involvement. This approach ignores the variability of concern within a group about a given topic. For example, some groups that are concerned with a topic may have members that are not totally concerned with the purpose of the group but only concerned with the status bestowed by membership. The third definition is the extremity of the person's position on a topic. Several problems exist with this method. First, this may be simply an artifact of the scales used. If scale ends were expanded and more extreme scores used we may find that previously ego involved subjects are indeed not ego involved. Moreover, it seems reasonable that a person might be ego involved with a moderate position. The extremity approach would rule these people out. The fourth definition is the number of categories that a person uses to describe various positions on a topic. The assumption is made that an ego involved subject sees positions on a topic as being "black or white." In other words, the ego involved person lumps positions on a topic into very few categories. Unfortunately, this method has not been fruitful. Wilmot (1971) found this method to be only weakly related to attitude change.

It seems that investigating the premise that ego involvement is related to a negative reaction to discrepancy is not testable with current techniques. However, the relationship between the amount of advocated change and the amount of attitude change obtained has been tested. As the discrepancy increases some amount of attitude change results (either in a positive or negative direction).

Thus, in all three explanations information is considered in investigating the discrepancy issue. Premises have been added which have been untested or questionably tested. In either case, they seem unnecessary since the basic relationship is between the amount of change advocated in a message and the amount of change obtained. The initial premises seem to be not as important.

The third advantage of the information approach is that it is readily amenable to measurement. Hopefully, the constructs which we posit in theories are measurable or those not directly quantifiable can be measured indirectly. Unfortunately, the three explanations reviewed have key constructs not directly measurable.

The dissonance approach has two areas that are not directly or indirectly measured. The first area is whether dissonance exists. In the studies reviewed, no attempt was made to determine whether discrepancy had prompted dissonance. Given this lack of support, the theoretical construct is not empirically useful since it relies on the researcher's a priori assumption that a situation is dissonance-producing.

The second problem is that it is never clear what the relationship is between the amount of change advocated and the amount of

discrepancy felt. If the a priori assumption of the researchers is true, i.e., dissonance exists when discrepancy exists, we are still faced with the problem of determining to what extent dissonance exists. Is there a linear relationship between the amount of change advocated and dissonance? Is it curvilinear? If we do not know the extent to which it covaries with discrepancy or even attitude change, then we cannot predict accurately.

The group approach seems to have only one problem dealing with measurement. The problem deals with measuring a person's felt need to conform to group pressure. The a priori assumption is always made that the individual feels some pressure from the group, but it is rarely tapped. It would seem that this construct would be an important variable to include in empirical research since its existence or non-existence will warrant the individual's acceptance or rejection of communication.

The social judgment approach has problems dealing with measurement of ego involvement. As indicated earlier, the measures of ego involvement have validity problems. Wilmot (1971) investigated the construct validity of three widely used social judgment methods of measuring ego involvement. His conclusion is:

. . . the methods used to measure ego involvement operated independently in some cases and in others were only weakly related. The significant relationship--latitude of rejection and acceptance--between the ordered alternatives and Diab method (evaluation of positions with semantic differential) were so low they were meaningless.<sup>4</sup>

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<sup>4</sup>Wilmot, op. cit., p. 223.

This variable is key to the social judgment approach, yet the validity of the measures is in question.

Fortunately, the information explanation circumvents the problems stated above by making no assumptions about the pressure the person is feeling from within or without. It only examines the amount of discrepancy between the person's attitude and the message position. It investigates the amount of interaction the person has about the topic and related topics. In each of these cases operational definitions can be formulated that avoid unmeasurable assumptions. This will become clearer when we provide specific operational definitions.

On the basis of the previous three advantages, the investigation of the relationship between the amount of change advocated in a message and the amount of change obtained using an information explanation is warranted. An information model has been developed by Woelfel (1972) which is called linear force aggregation. This information model deals with both attitude formation and attitude change. An attitude is conceptually defined as the information a person has about his relationship to objects. Given this definition, attitude change in this model is a function of those processes by which information about a person's relationship to objects are communicated to him.

This theory contains a number of mathematical equations from which may be derived testable hypotheses. This theory is a simple linear model that assumes that the effect of a set of messages ( $m_1, m_2, \dots, m_n$ ) on an attitude tends to have an affect equal to all other messages received or  $1/n^{\text{th}}$  of the total effect. It further

assumes that no other variables have a substantial effect on the relationship. The equation below indicates that an attitude should be defined as the arithmetic mean of the values of all messages proposed to an individual:

$$\bar{A} = 1/n m_1 + 1/n m_2 + 1/n m_3 + \dots + 1/n m_n = \sum_{i=1}^n \frac{m_i}{n}$$

If a message ( $m_i$ ) is construed as having a force which tends to change a person's attitude then the force to change an attitude is defined in the equation below:

$$F = \frac{O(\bar{M}_1 - \bar{A}_1)}{t}$$

where  $O$  = the number of new messages,

$\bar{M}_1$  = new message value,

$\bar{A}_1$  = old attitude, and

$t$  = time unit involved in the presentation of the message, e.g., 1 hour.

The message interacts with the force of a message to form a new attitude  $A_2$ . This attitude is defined by the equation below:

$$A_2 = \frac{N \bar{A}_1 + O\bar{M}_1}{N + O}$$

where  $\bar{A}_2$  = the new attitude,

$\bar{A}_1$  = the old attitude,

$N$  = the number of messages out of which the old attitude was formed,

$\bar{M}_1$  = new message value, and  
 $O$  = the number of new messages.

The change in attitude after having received a message is defined by the equation below:

$$\bar{A}_2 - \bar{A}_1 = \frac{O(\bar{M}_1 - \bar{A}_1)}{N + O} .$$

The equations presented so far indicate that there are five important variables involved in attitude change: (1) velocity, (2) acceleration, (3) inertial mass, (4) mass of message, and (5) amount of change advocated in a message. Velocity in attitude change is defined as the rate of change or simply as the change in attitude during an interval of time. The equation below represents velocity or rate of attitude change:

$$V_i = \frac{\bar{A}_n - \bar{A}_m}{t}$$

where  $V_i$  = velocity in interval  $i$ ,  
 $\bar{A}_n$  = attitude at time  $n$ ,  
 $\bar{A}_m$  = attitude at time  $m$ , and  
 $t$  = time elapsed in interval.

The second variable of attitude change is acceleration: the change in the rate of attitude change. It is defined below:

$$Acc_i = (\bar{A}_p - \bar{A}_o) - (\bar{A}_n - \bar{A}_m)$$



where  $Acc_i$  = the acceleration during interval  $i$ ,  
 $\bar{A}_p - \bar{A}_o$  = the velocity during interval  $p-o$ , and  
 $\bar{A}_n - \bar{A}_m$  = the velocity during interval  $n-m$ .

The third variable that affects attitude change is the number of messages out of which an attitude is formed. These messages are called the inertial mass of the attitude.

The fourth variable that affects attitude change is the number of messages advocating the new attitude. The messages represent the mass of the message.

The fifth variable is the impact the message will have which Woelfel defines in terms of the amount of change advocated in a message. Simply, it is defined as the difference between the message statement and the initial attitude. The equation below indicates this impact:

$$I = \bar{M}_1 - \bar{A}_1$$

where  $I$  = impact of message,  
 $\bar{M}_1$  = new message value, and  
 $\bar{A}_1$  = initial attitude.

Given the above variables and equations, the following hypotheses may be derived from the theory:

1. There is a positive linear relationship between the amount of change advocated in a message and the absolute rate of change obtained (measured as velocity).

Woelfel's model is a simple linear formulation. Attitude change in this model is measured by taking the absolute difference

between two attitudes. Another approach used in previous studies has investigated not only absolute differences but percentage differences (Hovland and Pritzker, 1957; and Goldberg, 1954). Staying within Woelfel's linear model, the second hypothesis uses the percentage measure.

2. There is a positive linear relationship between the amount of change advocated in a message and the relative rate of change obtained (measured as velocity).
3. There is a positive linear relationship between the amount of change advocated in a message and the absolute change in the rate of attitude change obtained (measured as acceleration).
4. There is a negative linear relationship between the amount of information a person has about a topic and the amount of attitude change obtained (measured as acceleration).
5. There is a positive linear relationship between the number of messages (mass of messages) advocating a given amount of change and the rate of change obtained (measured as velocity).

It should be noted that no research has been conducted on these hypotheses derived from Woelfel's model. Thus, the relationships specified here are based upon the assumptions indicated in the early formulation of the theory.

In the next chapter I will describe the methods used to test these hypotheses.

## CHAPTER II

### METHODOLOGY

#### Definitions

This section will attempt to develop conceptual and operational definitions of six key constructs in Woelfel's model: (1) attitude, (2) velocity, (3) acceleration, (4) amount of change advocated in the message (impact or force of the message), (5) inertial mass of the attitude, and (6) the mass of the incoming messages.

An attitude is defined as an informational structure that indicates a person's relationship to an object. It may be operationalized fundamentally (Torgerson, 1958) by asking an individual what he thinks an object should be. In the present study, individuals were asked to define their attitudes toward three topics by responses to the following questions:

1. How much should the federal government spend each year for cancer research?
2. What do you think the average class size at Michigan State University should be?
3. How much do you think the average family should donate to charity each year?

Each question was followed by numbered intervals from which the subject could check the response most representative of his attitude. These three attitude questions appeared with other unrelated questions asking for similar judgments. All questions were pretested with 58 students from two different sections of a basic

undergraduate communication course at Michigan State University. From these student responses, intervals were constructed for each question. The questions were left open ended with a response category of "no idea" provided. The pre-test means for each question were:

<u>Attitude</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Frequency of "No Idea"</u>
Funds for cancer research	\$37,205,380	\$130,922,369	41
Class size at MSU	35.24 students	17.37	4
Charity donations	\$134.46	226.63	25

From this, the following intervals were used on the final instrument.

<u>Attitude</u>	<u>Response Range</u>	<u>Interval Size</u>
Funds for cancer research	\$25 million to \$300 million	\$25 million
Class size at MSU	15 students to 150 students	15 students (app.)
Charity donations	\$50 to \$600	\$50

Woelfel's model examines two kinds of attitude change: velocity and acceleration. Velocity represents the amount of attitude change across an interval of time. Seven velocity-time intervals were investigated here:

$$\text{Velocity}_1 = \text{Attitude time 2} - \text{Attitude time 1}$$

$$\text{Velocity}_2 = \text{Attitude time 3} - \text{Attitude time 2}$$

$$\text{Velocity}_3 = \text{Attitude time 4} - \text{Attitude Time 3}$$

$$\text{Velocity}_4 = \text{Attitude time 5} - \text{Attitude time 4}$$

$$\text{Velocity}_5 = \text{Attitude time 3} - \text{Attitude time 1}$$

$$\text{Velocity}_6 = \text{Attitude time 5} - \text{Attitude time 3}$$

$$\text{Velocity}_7 = \text{Attitude time 5} - \text{Attitude time 1}^5$$

The final three listed cover longer time periods. By comparing them with the first four velocity measures, it should give us some idea of the effect that a message is having in a short interval of time and in longer intervals of time. The short term intervals were chosen because they would clearly show the influence of the messages; i.e., the first message would influence  $\bar{A}_2 - \bar{A}_1$  and so on. The long term intervals were chosen since they would indicate the impact on acceleration ( $\bar{A}_5 - \bar{A}_3$  and  $\bar{A}_3 - \bar{A}_1$ ) and they would indicate the overall impact of the repeated messages ( $\bar{A}_5 - \bar{A}_1$ ).

Acceleration is defined by the change in the velocity of an attitude. In this study, acceleration was defined by subtracting  $\text{Velocity}_5$  from  $\text{Velocity}_6$ . This subtraction is seen most clearly by the following formula:

$$\begin{aligned} \text{Acceleration} &= (\text{Attitude time 5} - \text{Attitude time 3}) \\ &\quad - (\text{Attitude time 3} - \text{Attitude time 1}). \end{aligned}$$

While Woelfel looked at the amount of attitude change in both velocity and acceleration, this research posited a third way of looking at attitude change and that is the percent of change obtained for a given amount of change advocated. The intervals for the percentages

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<sup>5</sup>These need to be divided by time, i.e.,  $V_1 = \frac{\bar{A}_2 - \bar{A}_1}{t}$ , but since  $t$  is constant in this study (1 week) it is fair to leave it out in a correlational analysis.

were chosen because they represented the intervals that would show the impact of each message. This variable was calculated by forming the following ratio:

$$\text{Percent of change obtained} = \frac{\text{Velocity}_{1-2}}{\text{Amount of change advocated}_{1-2}}$$

The third variable is the amount of change advocated in a message or the impact of the message on attitude change. This variable is represented as the discrepancy between the position advocated in a message and a person's attitude before receiving the message. There are three discrepancies in this investigation:

$$\begin{array}{l} \text{Amount of change advocated} \\ \text{(Discrepancy}_1) \end{array} = \text{Message}_1 - \text{Attitude time 1}$$

$$\begin{array}{l} \text{Amount of change advocated} \\ \text{(Discrepancy}_2) \end{array} = \text{Message}_2 - \text{Attitude time 2}$$

$$\begin{array}{l} \text{Amount of change advocated} \\ \text{(Discrepancy}_3) \end{array} = \text{Message}_3 - \text{Attitude time 3}$$

The fourth variable is the inertial mass of the attitude. Woelfel defines inertial mass as ". . . that quality of an attitude in cognition which resists acceleration,"<sup>6</sup> but further argues that this quality is proportional to the amount of information out of which the attitude has been formed (Woelfel, 1974). In this study the inertial mass was operationalized as the amount of time that an individual

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<sup>6</sup>Joseph Woelfel, "A Theory of Linear Force Aggregation in Attitude Formation," unpublished manuscript, University of Illinois, 1971, p. 9.

spends interacting with others about a topic or related topics.

This provides a reasonable approximate measure of the total amount of information the individual has received assuming that roles of interaction on the topic have been roughly constant prior to the onset of the research. The mass of an attitude was estimated for each attitude by the following questions:

To whom have you talked in the past about this and related topics?

On the average, how often have you talked to these people about this and related topics?

These questions were pretested with 37 Communication 100 students from one section. The pretest goal was to develop intervals for the amount of interaction about the topic. In previous research, and here, hours/months were used as units of time to estimate the inertial mass. The pretest means, standard deviation, and ranges for each attitude mass are listed below. The responses were in hours/month.

<u>Attitude</u>	<u>Mean Hours/Month</u>	<u>Standard Deviation</u>	<u>Range</u>
Funds for cancer research	1.44	1.97	8 - 0
Class size at MSU	2.60	3.27	15 - 0
Charity donations	1.53	0.95	4 - 0

On the basis of this pretest, the frequency of interaction was measured by a scale ranging from 0 to 13 hours/month.

Thus, the mass of the attitude was initially measured by two responses: (1) the persons talked to about the topic were listed, and (2) the number of hours/month spent talking with each person was

listed. I then summed all the time spent interacting with others about a topic and that represented the person's inertial mass of attitude.

The fifth variable was the mass of the messages sent to the subject. In this study each subject received three messages/attitude. Each message received for a given attitude contained three kinds of information: (1) a source was indicated which advocated a certain position, (2) information was provided that indicated the current state of each topic, and (3) information was provided about what the state should be. Every subject's message was identical with respect to the first two kinds of information. However, the subjects were divided into three groups and each group received a different "should" position advocated (third bit of information). The following chart indicates the level of each "should" and "is" position advocated for a topic.

<u>Attitude</u>	<u>"Is"</u>	<u>"Should Be"</u>
Funds for cancer research	\$50 million	\$75 million \$100 million \$200 million
Class size at MSU	30 students	45 students 60 students 100 students
Charity donations	\$100	\$150 \$200 \$400

While different groups of subjects received different levels of "should" position, each subject always received the same level of "should" in all three messages; i.e., each subject always received



three messages advocating the same position. In other words, if a subject received a message saying that the average class size at MSU should be 45 students at time 1, the other two messages he received advocated a position of 45 students also. The complete message set is in Appendix A.

All subjects were given the same sources. Each source was a mass medium and an attempt was made to hold the credibility of the sources constant for a given topic. The media were newspapers or news magazines that would likely carry an article advocating such a position. Below are the sources used for each topic and message.

<u>Topic</u>	<u>Message 1</u>	<u>Message 2</u>	<u>Message 3</u>
Funds for cancer research	<u>U.S. News &amp; World Report</u>	<u>New York Times</u>	<u>Time Magazine</u>
Class size at MSU	<u>State News</u>	<u>State Journal</u>	<u>State News</u>
Charity donations	<u>Time Magazine</u>	<u>Newsweek</u>	<u>Wall Street Journal</u>

While three messages were given per topic, an attempt was made to keep their mass equal to one hour/month. Each message and subsequent responses to scale items took approximately 20 minutes to complete. The cumulative mass of the messages over the five week period was approximately one hour/month. This assumption was made in all of Woelfel's equations requiring the inclusion of the mass of the incoming messages.

### Design

This study is a longitudinal investigation using five points in time and three messages. Eight sections of Communication 100 were used to form three experimental groups and one control group. The formation of the four groups was made by the instructor. If an instructor had two classes used, those two were formed into one. Given the longitudinal nature of the investigation, it was decided to keep subjects in intact groups and pool them into groups after the questionnaires had been filled out.

Each experimental group received a series of messages advocating a given position on an issue. Three issues were used with each issue receiving three messages over time. In the pretesting to form scale intervals it was noted that subjects interacted about the topics while filling out the questionnaires. Since this was a longitudinal study, I was concerned that if messages were randomly assigned to subjects, interaction among them would disclose the different message elements. Given this concern, message treatments were randomly assigned to groups.

The investigation took place from April 18-May 23, 1973. The experimental groups received five questionnaires which measured their attitudes about various topics including the experimental attitudes. The first of the five questionnaires measured the inertial mass of the attitudes. Just preceding the administration of the second, third, and fourth questionnaires, the experimental messages were read by subjects. At the second testing, 12 messages were given about 12 different topics. Only the three messages that were carried across

time will be reported in this thesis. At the third and fourth times, only those three messages were given. And at time five, all 12 original attitudes were measured.

The control group was measured at times one, two, and five.

Below is a chart indicating the testing patterns for the experimental and control groups:

Time <sub>1</sub>	Time <sub>2</sub>	Time <sub>3</sub>	Time <sub>4</sub>	Time <sub>5</sub>
<u>Experimental</u> April 18	<u>Experimental</u> April 23 & 25	<u>Experimental</u> May 2 & 4	<u>Experimental</u> May 9	<u>Experimental</u> May 23
12 Attitude measurements 12 Inertial mass measures	12 Attitude measurements 12 Messages	12 Attitude measurements 3 Messages	3 Attitude measurements 3 Messages	12 Attitude measurements
<u>Control</u> April 18	<u>Control</u> April 25	<u>Control</u> Nothing	<u>Control</u> Nothing	<u>Control</u> May 27
12 Attitude measurements 12 Inertial mass measures	12 Attitude measurements 12 Inertial mass measures			12 Attitude measurements 12 Inertial mass measures

Unfortunately, a problem that plagues longitudinal studies is that of attrition. This study was no exception. The charts below list the number of subjects in each group and the total number measured at any given time. These charts also indicate how many people were matched for consecutive observations.

The charts show the extent of the attrition in this investigation. The questionnaires that are missing from time to time resulted from three factors: (1) people who were absent on the testing date; (2) people who did not put their student identification numbers on

	Time <sub>1</sub>	Time <sub>2</sub>	Time <sub>3</sub>	Time <sub>4</sub>	Time <sub>5</sub>
Group <sub>1</sub>	57	50	42	49	51
Group <sub>2</sub>	49	50	28	39	27
Group <sub>3</sub>	54	46	38	31	40
Total	160	146	108	119	118
Control	44	40	--	--	36

<u>Matched</u>	T <sub>1</sub> & T <sub>2</sub>	T <sub>1</sub> & T <sub>2</sub> & T <sub>3</sub>	T <sub>1</sub> & T <sub>2</sub> & T <sub>3</sub> & T <sub>4</sub>	T <sub>1</sub> & T <sub>2</sub> & T <sub>3</sub> & T <sub>4</sub> & T <sub>5</sub>
Group <sub>1</sub>	32	24	20	19
Group <sub>2</sub>	28	11	10	5
Group <sub>3</sub>	29	16	12	9
Total	89	51	42	33
Control	18	--	--	T <sub>1</sub> & T <sub>2</sub> & T <sub>5</sub> 10

the questionnaire, and (3) people who indicated that they had no further interest in being part of the study.

The decision was made to only do the analyses on the 33 people whose questionnaires were complete for all five times. This way biases resulting from substituting other values for the missing values are avoided. Obviously, other biases may be operating given the large attrition rate that existed.

## CHAPTER III

### RESULTS

This chapter is divided into six sections. Five of the sections correspond to the analysis of each of the five hypotheses. Each of these five sections contains tables of the relevant variables, their descriptive statistics (means and standard deviations), and statistical tests (correlational tests or significance tests.) Two of these hypotheses sections contain graphs of variable means. The sixth section of the chapter is an analysis of the control group; it contains tables of relevant variables, their descriptive statistics and correlations among them.

Before going directly into the hypotheses sections it is necessary to provide a brief description of the mean attitudes at each observation and the mean message position for the three topics.

The class size means are presented below:

	<u>Mean Attitude</u>	<u>Mean Message Position</u>
Time 1	36.6	61.1
Time 2	35.6	61.1
Time 3	39.4	61.1
Time 4	40.3	
Time 5	43.2	

(units = students)

This topic shows a slowly increasing pattern. In this case the mean attitude moves slowly toward the message position. The amount of change is small in comparison to the other topics.

The means for the cancer funds topic are as follows:

	<u>Mean Attitude</u>	<u>Mean Message Position</u>
Time 1	162.9	96.9
Time 2	112.1	96.9
Time 3	114.4	96.9
Time 4	108.3	
Time 5	127.3	

(units = \$/millions)

The attitude shifts closer to the message position following time 1, but then it tends to stabilize.

The mean attitudes and mean message positions for the charity donations topic are listed below:

	<u>Mean Attitude</u>	<u>Mean Message Position</u>
Time 1	11.6	20.9
Time 2	18.4	20.9
Time 3	17.6	20.9
Time 4	18.1	
Time 5	18.6	

(units = \$/hundreds)

In essence, the means indicate that the mean attitude changed after time 1 to conform to the message position. It is interesting to note that the mean attitude tended to stabilize beginning at time 2.

The preceding means were used to compute change scores and percentages for the analysis of the hypotheses. Hypothesis 5 provides for an in-depth analysis of trends suggested by these means.

Hypothesis 1: There is a positive linear relationship between the amount of change advocated in a message and the absolute rate of change obtained (measured as velocity).

In order to test the linearity of the relationship between the amount of change advocated and the rate of change obtained, six zero-order correlation coefficients were computed for each of the three topics.

These correlation coefficients will provide an estimate of the deviation of scores from a straight regression line. The higher the correlation, the better the fit of the data to the regression line. The degree of fit will be interpreted as an indication of linearity. In order to better assess the linearity, scatterplots were obtained. Appendix E contains the scatterplots for each correlation coefficient.

Three of the correlations were for short term effects, i.e., the relationship as it existed for an interval of a week between pretesting, treatment, and post-test. These short term correlations are indicated below:

Short Term

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_2 - \bar{A}_1$$

$$\bar{M}_2 - \bar{A}_2 \text{ with } \bar{A}_3 - \bar{A}_2$$

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_4 - \bar{A}_3$$

where  $\bar{M}$  = position advocated in message,

$\bar{A}$  = subject attitudes, and

1 . . . 5 = time segment.

The remaining three correlations, aimed at long term effects, are listed below:

Long Term

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_3 - \bar{A}_1$$

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_5 - \bar{A}_3$$

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_5 - \bar{A}_1$$

The .05 level of significance was the criteria selected for the correlations.

Table 1 indicates the variables, their descriptive statistics, and correlations for the three topics.

In terms of proposed class size at MSU, the first message received by the subjects advocated an average class size of 25 students more than the average subject's initial opinion. The corresponding change between time 1 and time 2 was -1; that is, the mean moved one unit in the opposite direction of that advocated. However, the standard deviation between the amount of change advocated and velocity are similar (29.4 for change advocated and 21.4 for velocity).

The second message advocated an average of 26 more students than the average subject's initial opinion. The corresponding change between time 2 and time 3 was four students. In other words, the mean opinion moved four students closer to the message position. The standard deviations are quite different (24.5 for advocated change and 11.5 for velocity).

The third message advocated a position 22 students larger than the mean attitude of the subjects. The change resulting from the message between time 3 and time 4 was -1. Again, the standard deviations are quite different (25.3 for advocated change and 6.6 for velocity).



TABLE 1.--Means, Standard Deviations, and Correlations for Velocity and Amount of Change Advocated for Three Topics.

CLASS SIZE AT MSU <sup>a</sup>		
Variable	Mean	Standard Deviation
<u>Amount of change advocated</u>		
$\bar{M}_1 - \bar{A}_1$	24.5	29.4
$\bar{M}_2 - \bar{A}_2$	25.5	24.5
$\bar{M}_3 - \bar{A}_3$	21.8	25.3
<u>Velocity</u>		
$\bar{A}_2 - \bar{A}_1$	-.9	21.5
$\bar{A}_3 - \bar{A}_2$	3.7	11.5
$\bar{A}_4 - \bar{A}_3$	.9	6.6
$\bar{A}_5 - \bar{A}_4$	2.9	25.2
$\bar{A}_3 - \bar{A}_1$	2.7	18.8
$\bar{A}_5 - \bar{A}_3$	3.9	24.5
$\bar{A}_5 - \bar{A}_1$	6.6	30.5
<u>Correlation</u>		
<u>Short term</u>		
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_2 - \bar{A}_1$		$r = .5717^{\dagger}$
$\bar{M}_2 - \bar{A}_2$ with $\bar{A}_3 - \bar{A}_2$		$r = .1770$
$\bar{M}_3 - \bar{A}_3$ with $\bar{A}_4 - \bar{A}_3$		$r = .1685$
<u>Long term</u>		
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_3 - \bar{A}_1$		$r = .5236^{\dagger}$
$\bar{M}_3 - \bar{A}_3$ with $\bar{A}_5 - \bar{A}_3$		$r = .4657^{\dagger}$
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_5 - \bar{A}_1$		$r = .6316^{\dagger}$

<sup>a</sup>Units = students; n = 31.<sup>†</sup>p < .05.

Table 1.--Continued.

CANCER FUNDS <sup>b</sup>		
Variable	Mean	Standard Deviation
<u>Amount of change advocated</u>		
$\bar{M}_1 - \bar{A}_1$	-65.9	98.9
$\bar{M}_2 - \bar{A}_2$	-15.1	52.3
$\bar{M}_3 - \bar{A}_3$	-17.4	53.9
<u>Velocity</u>		
$\bar{A}_2 - \bar{A}_1$	-50.8	91.3
$\bar{A}_3 - \bar{A}_2$	2.3	56.4
$\bar{A}_4 - \bar{A}_3$	-6.1	34.8
$\bar{A}_5 - \bar{A}_4$	18.9	50.4
$\bar{A}_3 - \bar{A}_1$	-48.5	82.2
$\bar{A}_5 - \bar{A}_3$	12.9	53.8
$\bar{A}_5 - \bar{A}_1$	-35.6	86.2
<u>Correlation</u>		
<u>Short term</u>		
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_2 - \bar{A}_1$		$r = .8521^{\dagger}$
$\bar{M}_2 - \bar{A}_2$ with $\bar{A}_3 - \bar{A}_2$		$r = .5092^{\dagger}$
$\bar{M}_3 - \bar{A}_3$ with $\bar{A}_4 - \bar{A}_3$		$r = .3892^{\dagger}$
<u>Long term</u>		
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_3 - \bar{A}_1$		$r = .8385^{\dagger}$
$\bar{M}_3 - \bar{A}_3$ with $\bar{A}_5 - \bar{A}_3$		$r = .5508^{\dagger}$
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_5 - \bar{A}_1$		$r = .8568^{\dagger}$

<sup>b</sup>Units = \$ (millions); n = 33.

<sup>†</sup>p < .05.

Table 1.--Continued.

CHARITY DONATIONS <sup>c</sup>		
Variable	Mean	Standard Deviation
<u>Amount of change advocated</u>		
$\bar{M}_1 - \bar{A}_1$	9.3	8.9
$\bar{M}_2 - \bar{A}_2$	2.4	11.6
$\bar{M}_3 - \bar{A}_3$	3.3	6.4
<u>Velocity</u>		
$\bar{A}_2 - \bar{A}_1$	6.9	11.8
$\bar{A}_3 - \bar{A}_2$	-.9	10.0
$\bar{A}_4 - \bar{A}_3$	.5	5.1
$\bar{A}_5 - \bar{A}_4$	.5	10.8
$\bar{A}_3 - \bar{A}_1$	6.0	9.9
$\bar{A}_5 - \bar{A}_3$	1.0	10.6
$\bar{A}_5 - \bar{A}_1$	7.1	11.9
<u>Correlation</u>		
<u>Short term</u>		
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_2 - \bar{A}_1$		$r = .3953^\dagger$
$\bar{M}_2 - \bar{A}_2$ with $\bar{A}_3 - \bar{A}_2$		$r = .8325^\dagger$
$\bar{M}_3 - \bar{A}_3$ with $\bar{A}_4 - \bar{A}_3$		$r = .1651$
<u>Long Term</u>		
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_3 - \bar{A}_1$		$r = .7719^\dagger$
$\bar{M}_3 - \bar{A}_3$ with $\bar{A}_5 - \bar{A}_3$		$r = .1584$
$\bar{M}_1 - \bar{A}_1$ with $\bar{A}_5 - \bar{A}_1$		$r = .4304^\dagger$

<sup>c</sup>Units = \$ (hundreds); n = 29.<sup>†</sup>p < .05.

For the class size at MSU topic, only one of the short term correlations was significant:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_2 - \bar{A}_1, \quad r = .5717, p < .05.$$

By examining the scatterplots for the correlations it is possible to determine why two of the short term correlations are not significant. Of the 31 people who were involved in this topic, 26 showed no attitude change across all the levels of change advocated:

$$\begin{aligned} \bar{M}_2 - \bar{A}_2 \text{ with } \bar{A}_3 - \bar{A}_2 &= 26 \text{ no change,} \\ \bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_4 - \bar{A}_3 &= 26 \text{ no change.} \end{aligned}$$

The significant correlation had 16 people who did not change their attitude out of 31 total subjects. This is less than the number of people who did not change their attitudes for the correlations that were not significant:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_2 - \bar{A}_1 = 16 \text{ no change.}$$

The long term changes show larger mean velocity and standard deviations. Between the first and third observations, the mean opinion changed by three students (standard deviation = 18.8). The third and fifth times showed a mean opinion change of four students (standard deviation = 24.5); the first and fifth times showed an overall mean change of seven students (standard deviation = 30.5).

For the long term change correlations all three were significant:

$$\begin{aligned} \bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_3 - \bar{A}_1, & \quad r = .5236, p < .05; \\ \bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_5 - \bar{A}_3, & \quad r = .4657, p < .05; \\ \bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_5 - \bar{A}_1, & \quad r = .6316, p < .05. \end{aligned}$$

It should be noted that while the correlation between  $\bar{M}_3 - \bar{A}_3$  and  $\bar{A}_5 - \bar{A}_3$  is significant and provides an indication of linearity, this correlation is influenced by two extreme scores. It is suggested that the correlation be interpreted tentatively as being linear but with some reservations because of the extreme scores.

Thus, the hypothesis receives some support for the short term and strong support for the longer intervals (2-5 weeks between the pretest, treatment, and post-test).

In the cancer funds topic, the first message advocated a mean level of change for cancer funds which was -\$66 million or \$66 million lower than the mean opinion of the subjects. The subsequent attitude change resulting from the message occurred between time 1 and time 2 and was a mean of -\$51 million. In these cases the standard deviations are also similar (98.9 for advocated change and 91.3 for velocity).

The second message advocated a mean level of attitude change for cancer funds which was -\$15 million or \$15 million lower than the mean attitude of the subjects. The resultant mean attitude change between time 2 and time 3 was \$2.3 million. While the means are different, the standard deviations are quite similar (52.3 for advocated change and 56.4 for velocity).

The third message advocated a mean level of attitude change for cancer funds which was -\$17.4 million or \$17.4 million lower than the subjects' mean opinion. The resulting mean attitude change

between time 3 and time 4 was -\$6.1 million. The standard deviations are different (53.9 for advocated change and 34.8 for velocity).

For the cancer funds topic, all three short term correlations are significant:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_2 - \bar{A}_1, \quad r = .8521, p < .05;$$

$$\bar{M}_2 - \bar{A}_2 \text{ with } \bar{A}_3 - \bar{A}_2, \quad r = .5092, p < .05;$$

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_4 - \bar{A}_3, \quad r = .3892, p < .05.$$

For the long term the mean velocities are larger. The mean velocity between time 1 and time 3 is -\$48.5 million (standard deviation = 82.2). The mean velocity between time 3 and time 1 is \$12.9 million (standard deviation = 53.8) and the mean velocity between time 1 and time 5 is -\$35.6 million (standard deviation = 86.2).

Further, all the long term correlations are also significant:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_3 - \bar{A}_1, \quad r = .8385, p < .05;$$

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_5 - \bar{A}_3, \quad r = .5508, p < .05;$$

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_5 - \bar{A}_1, \quad r = .8568, p < .05.$$

Thus, for the cancer funds topic, the linearity hypothesis received strong support for both short and long term effects.

The first message for the charity donations topic advocated a mean change of \$93. The resulting mean velocity between time 1 and time 2 was \$69. The standard deviations were similar (8.9 for advocated change and 11.8 for velocity).

The second message advocated a mean change of \$24 and received a mean change between time 2 and time 3 or -\$9. In other

words, the mean moved in the opposite direction. However, the standard deviations were quite similar (11.6 for advocated change and 10.0 for velocity).

The third message advocated a mean change of \$33 and received a mean change of \$5 between time 3 and time 4. The standard deviations were slightly different (6.4 for advocated change and 5.1 for velocity).

Two of the short term correlations for the charity donations topic were significant:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_2 - \bar{A}_1, \quad r = .3953, p < .05;$$

$$\bar{M}_2 - \bar{A}_2 \text{ with } \bar{A}_3 - \bar{A}_2, \quad r = .8325, p < .05.$$

Again, by examining the scatterplot for the correlations, we find a third of the people showing no attitude change (13/29):

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_4 - \bar{A}_3 = 13 \text{ no change.}$$

The two significant correlations had very few people who did not change their attitudes. This is in contrast to the correlation that was not significant:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_2 - \bar{A}_1 = 7 \text{ no change,}$$

$$\bar{M}_2 - \bar{A}_2 \text{ with } \bar{A}_3 - \bar{A}_2 = 0 \text{ no change.}$$

The mean long term velocities tended to be larger. The mean velocity between time 1 and time 3 is \$60 (standard deviation = 9.9). The mean velocity between time 3 and time 5 is \$10 (standard

deviation = 10.6) and the mean velocity between time 1 and time 5 is \$71 (standard deviation = 11.9).

For the long term, two of the correlations were significant:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_3 - \bar{A}_1, \quad r = .7719, p < .05;$$

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_5 - \bar{A}_1, \quad r = .4304, p < .05.$$

The one correlation that was not significant also possessed a relatively high number of people who did not change across levels of advocated change:

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_5 - \bar{A}_3 = 15 \text{ no change.}$$

The two significant correlations showed fewer people who did not change their attitudes:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_3 - \bar{A}_1 = 5 \text{ no change,}$$

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_5 - \bar{A}_1 = 9 \text{ no change.}$$

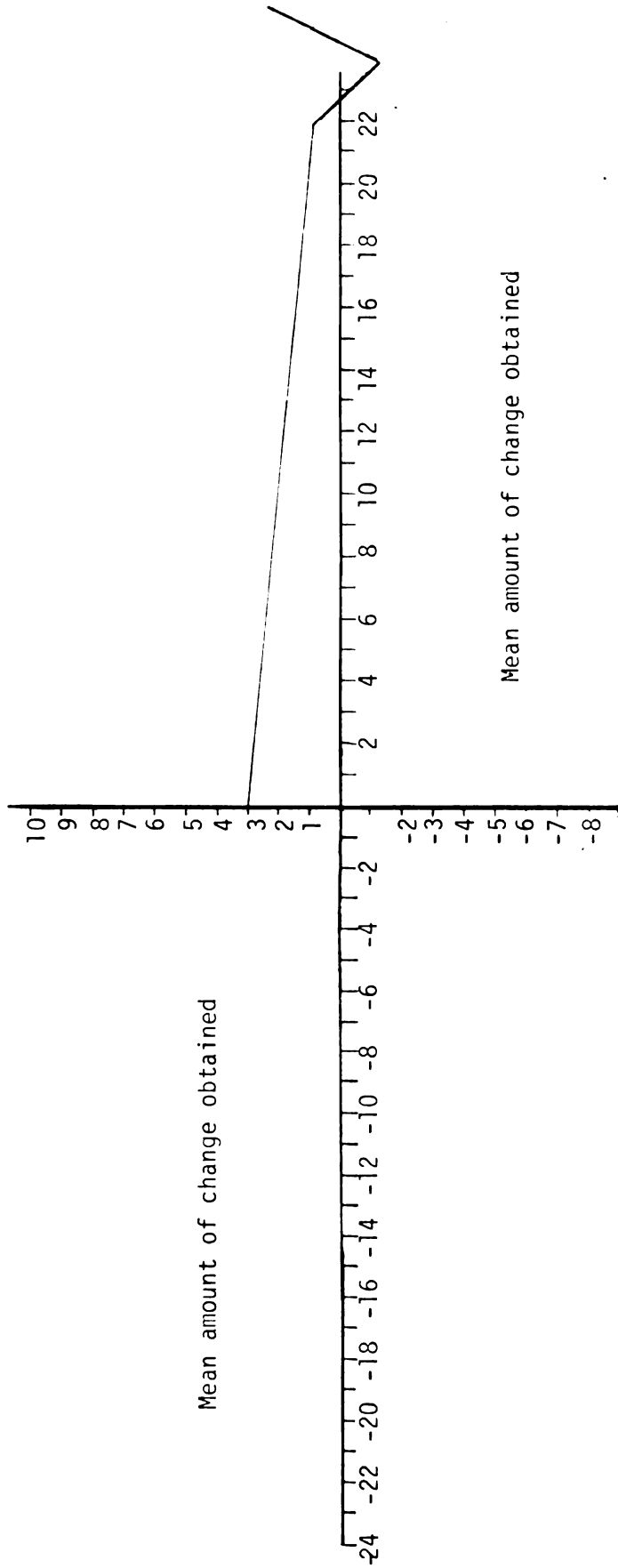
Thus, moderate support for the hypothesis was found for both the long and short term effects with the charity donations topic.

For all topics together, the hypothesis is conformed for six of the nine short term correlations. It should be noted that two of three nonsignificant correlations were in the class size topic.

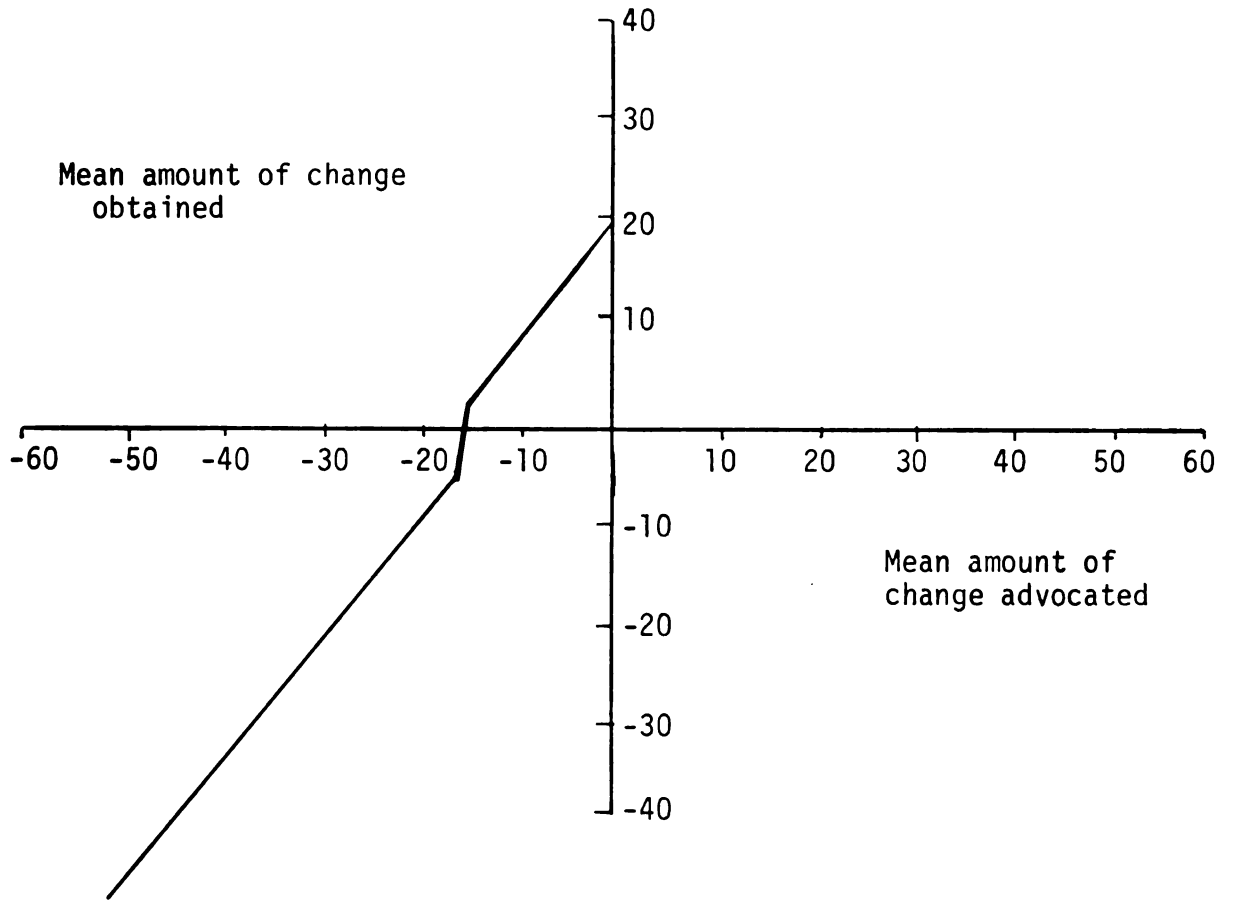
There is strong support for the long term hypothesis, with eight of the nine correlations significant.

When examining Graphs 1, 2, and 3 of the means for all topics, the linearity is apparent for two of the topics in the short term.

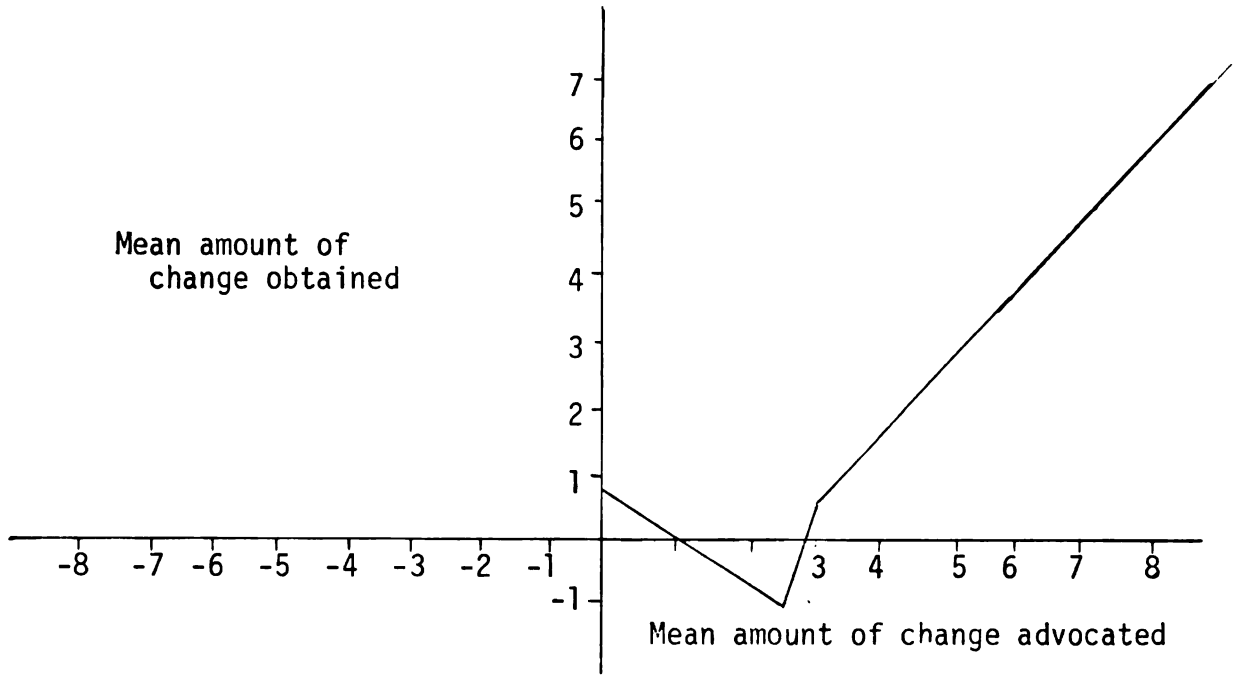




Graph 1.--Class Size--Mean Change Advocated by Mean Velocity



Graph 2.--Cancer Funds--Mean Change Advocated by Mean Velocity.



Graph 3.--Charity Donations--Mean Change Advocated by Mean Velocity.

The class size topic shows very little change for the low levels of change advocated and a larger increase at the high level of advocated change. This increase in mean change occurs at the level of advocated change where the correlation is highest; this is at the first message session:

$$\bar{M}_1 - \bar{A}_1 \text{ with } \bar{A}_2 - \bar{A}_1, \quad r = .5717, p < .05.$$

The cancer funds topic shows linearity in the graph of the means for the short term.

The charity donations topic shows only one slight indication of nonlinearity in the means. This deviation occurs when no message was given and therefore no amount of change was advocated.

In summary, the graphs of the means support the linearity hypothesis as do the correlations.

Hypothesis 2: There is a positive linear relationship between the amount of change advocated in a message and the relative rate of change obtained (measured as velocity).

This hypothesis was tested by examining the mean percent of change obtained by a given level of change advocated. It should be noted that in some cases negative percentages were obtained. In these cases, either the mean advocated change or the mean velocity was negative; whichever was negative, the other was positive. These negatives should be interpreted as movement away from the message position. For example, the percentage for class size at the mean advocated level of 24.5 was found as follows:

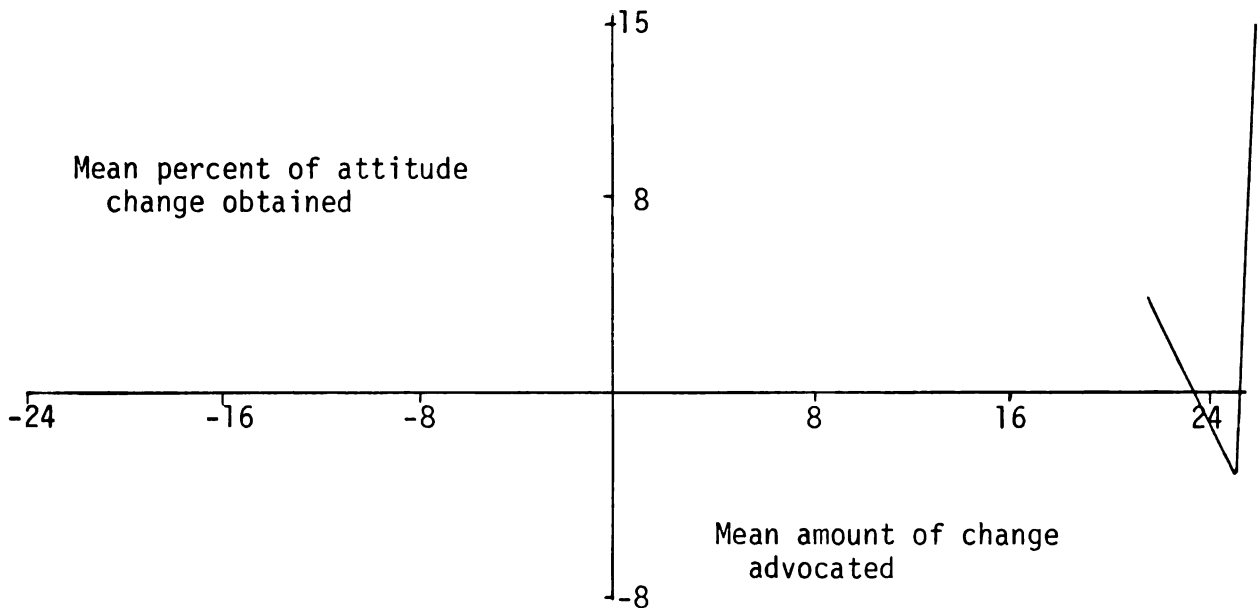
$$\frac{\bar{A}_2 - \bar{A}_1}{\bar{M}_1 - \bar{A}_1} = \frac{-0.9}{24.5} .$$

In the majority of cases the percentages are positive and report amount of change obtained of the change advocated.

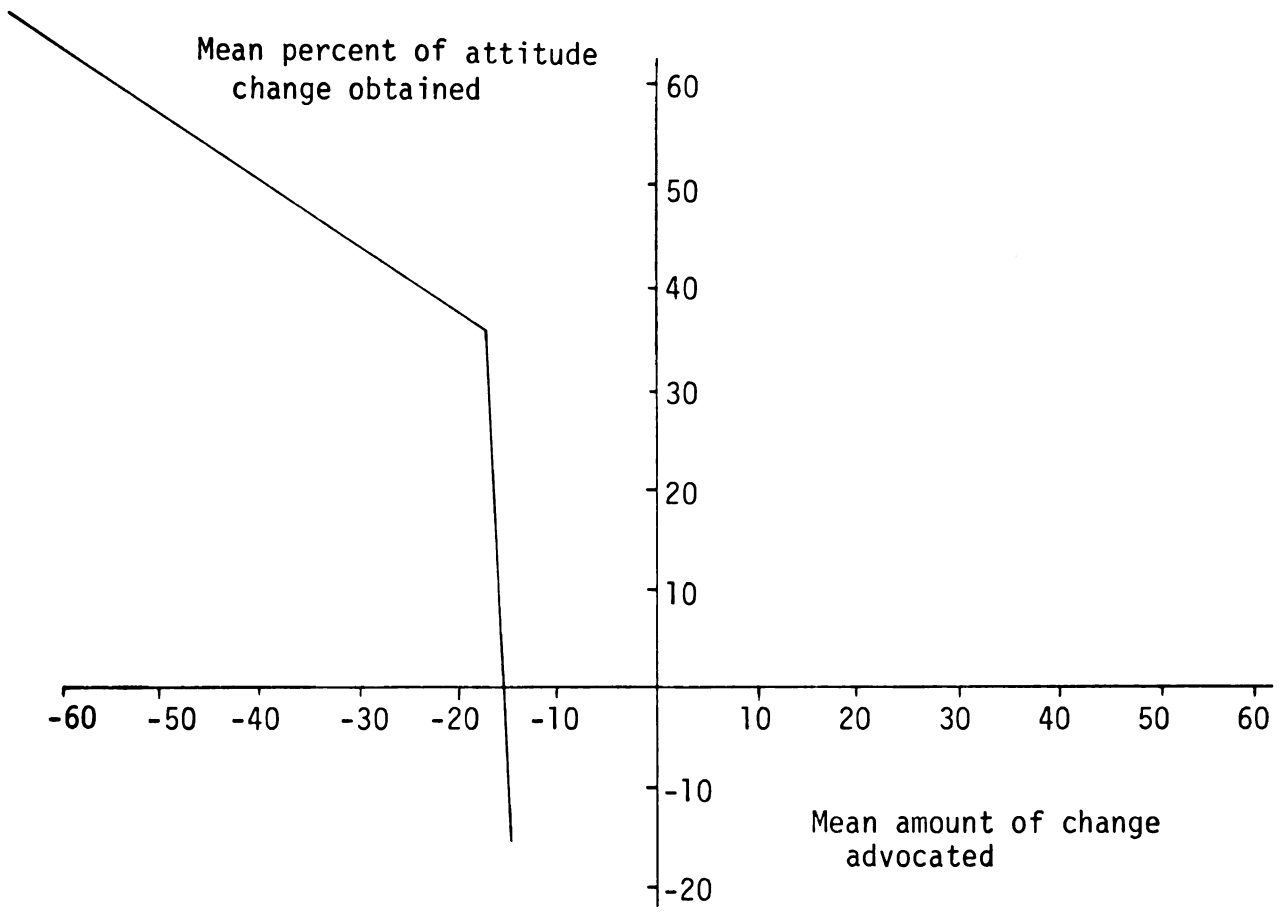
Table 2A indicates the mean amount of change advocated and the mean percent of change obtained for each topic for three time intervals ( $\bar{A}_2 - \bar{A}_1$ ,  $\bar{A}_3 - \bar{A}_2$ , and  $\bar{A}_4 - \bar{A}_3$ ). Graphs 4, 5, and 6 indicate what the relationships look like.

TABLE 2A.--Mean Percent of Attitude Change by Mean Amount of Change Advocated.

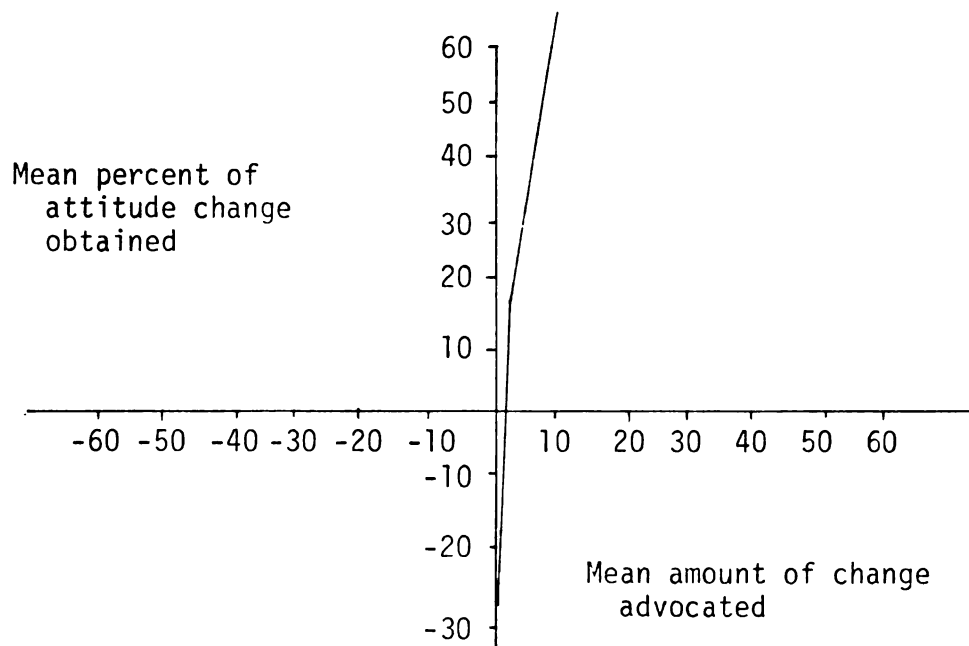
CLASS SIZE AT MSU			
	Mean Amount of Change Advocated		
	21.7742	24.5161	25.4839
Mean percent of change obtained	4%	-3%	15%
CANCER FUNDS			
	Mean Amount of Change Advocated		
	-15.1515	-17.4242	-65.9091
Mean percent of change obtained	-15%	34%	73%
CHARITY DONATIONS			
	Mean Amount of Change Advocated		
	2.4138	3.2759	9.3103
Mean percent of change obtained	-32%	16%	74%



Graph 4.--Class Size--Mean Change Advocated by Mean Percent Obtained.



Graph 5.--Cancer Funds--Mean Change Advocated by Mean Percent Obtained.



Graph 6.--Charity Donations--Mean Change Advocated by Mean Percent Obtained.



The results for the class size topic are confusing. Very little absolute change occurred as a result of the messages so the levels of advocated change for each preceding interval of time are very similar (21.78, 24.51, and 25.48). The trend in the means indicates that the largest mean percent was obtained at the largest level of advocated change but the lowest percent was for the moderate level of advocated change.

For the cancer funds topic, the relationship is positive and linear. As the amount of advocated change increases the relative rate of change increases. At the smaller levels of advocated change the amount of change obtained was negative.

For the charity donations topic, the relationship also seems to be positive and linear for the means. When the smallest level of change is advocated, some negative change occurs. As the level of change increases, so does the mean percentage.

Thus, this hypothesis seems to be supported clearly in two of the topics while it is only partially supported in the third topic.

An attempt was made to determine the significance of the difference between the mean percentages. Because in some cases the amount of change advocated was zero, the use of a significance test on the actual percentage was impossible since one cannot divide by zero to form the percent. As a result, the significance test was done using the following formula:

$$\frac{\bar{A}_2 - \bar{A}_1}{\bar{M}_1} .$$

This formula yielded a rough indication of the amount of change obtained for a unit of message advocated. Table 2B indicates the mean amount of change per message unit advocated and indicates the analysis done. Some percentages are negative. These percentages should be interpreted as being negative since they are simply artifacts of the method for computing them. For example, one percentage for cancer funds is negative because it is formed from the following computation:

$$\frac{-65.9091}{96.9} .$$

In this case the message position was asking people to move in a negative direction. In terms of interpretation there is no real difference between a negative and a positive percentage. For each of the topics a treatment-by-subjects or repeated-measure analysis of variance was done. Given the difference indicated by the means we would expect that the treatments would differ from each other and consequently the treatment  $F$  and  $\eta$  would be significant.  $\eta$  is a correlation measure which is applicable in linear and nonlinear cases. In this case, the assumption of linearity of the means seems justified so  $\eta$  may be used. If  $\eta$  is not significant then  $r$  would not be. (The individual  $r$ 's from Hypothesis 1 indicate linearity of absolute scores from which the relative rate of change was derived. The graphs [4, 5, and 6] of mean percentages also indicate linearity.)

The treatment (column)  $F$  (1.20) for class size was not significant at the .05 level. Thus the null hypothesis cannot be rejected. Correspondingly, the  $\eta$  is also small (.27). Since no

TABLE 2B.--Mean Change Per Unit Advocated by Mean Amount of Change Advocated.

CLASS SIZE AT MSU			
	Mean Amount of Change Advocated		
	21.7742	24.5161	25.4839
Mean $\bar{A}_2 - \bar{A}_1/\bar{M}_1$	.9%	-3%	6%
CANCER FUNDS			
	Mean Amount of Change Advocated		
	-15.1515	-17.4242	-65.9091
Mean $\bar{A}_2 - \bar{A}_1/\bar{M}_1$	-2%	-6%	-70%
CHARITY DONATIONS			
	Mean Amount of Change Advocated		
	2.4138	3.2759	9.3103
Mean $\bar{A}_2 - \bar{A}_1/\bar{M}_1$	-5%	3%	33%
TREATMENTS-BY-SUBJECTS, OR REPEATED MEASURES ANOVA			
	Class Size at MSU	Cancer Funds	Charity Donations
Total sum of squares	3.67	51.14	16.06
Total degree of freedom	38.00	62.00	68.00
Row sum of squares	.65	2.79	.36
Row degrees of freedom	12.00	20.00	22.00
Row mean squares	.05	.14	.02
Row F	.4728 p>.05	.17 p>.05	.05 p>.05
Column sum of squares	.27	15.08	2.37
Column degree of freedom	2.00	2.00	2.00
Column mean squares	.14	7.54	1.18
Column F	1.20 p>.05	9.06 p<.001	3.91 p<.05
Column $\eta$	.27	.54	.38
Column $\eta^2$	.07	.29	.15
Interaction sum of squares	2.74	33.27	13.33
Interaction degree of freedom	24.00	40.00	44.00
Interaction mean squares	.11	.83	.30

difference exists between treatment means the hypothesis was not confirmed for class size.

The treatment (column) F (9.06) for cancer funds is significant at the .05 level. Thus, there are significant differences between the column means. Further, the  $\eta$  is large (.54). In this case the hypothesis was confirmed.

The charity donations treatment (column) F (3.91) was significant at the .05 level. Thus, the treatment means are significantly different. Further, the  $\eta$  is large (.38). The hypothesis was also conformed for this topic.

Overall, the hypothesis seemed to find some support. However, this support is limited in two ways. First, the mean percentage represents an overall index of the subjects rather than individual indices within a velocity (as in the first hypothesis). Second, the formula was modified and tested, so at best the significance test is only indirectly testing the hypothesis.

Hypothesis 3: There is a positive linear relationship between the amount of change advocated in a message and the absolute amount of change obtained (measured as acceleration).

For all three topics, the correlation to test the hypothesis was between the following variables:

$$[\bar{M}_1 - \bar{A}_1] \text{ with } [(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)].$$

There are two variables that make up the acceleration equation: the velocity between time 5 and time 3, and the velocity between time 3 and time 1. The correlation represents the relationship between

the amount of change advocated and the change in the rate of attitude change.

If the relationship is positive and linear then the correlation ought to be significant and positive. Again, the correlation coefficient will be used as an indicator of linearity. The scatterplots for the correlations are in Appendix F.

Table 3 indicates the correlations between advocated change and acceleration for the three topics. The correlation for the class size topic was virtually zero.

The correlation for the cancer funds topic is significant but in the direction opposite of the predicted one ( $r = -.5874$ ). The result is contrary to the hypothesis.

The correlation for the charity donations topic is also significant and in the opposite direction of the prediction ( $r = -.6125$ ). This result confirms what the previous two correlations indicated: the relationship is negative linear.

Thus, the hypothesis is not supported. For all three topics the correlation is in the opposite direction (negative) and in two cases this negative relationship is significant.

Hypothesis 4: There is a negative linear relationship between the amount of information a person has about a topic and the amount of attitude change obtained (measured as acceleration).

In order to test this hypothesis two models were used: additive and interactive. In the additive model inertial mass was operationalized as frequency of interaction with others. The additive model assumes that the influence of inertial mass is independent of

TABLE 3.--Means, Standard Deviations, and Correlations for Amount of Change Advocated and Acceleration for Three Topics.

CLASS SIZE AT MSU <sup>a</sup>		
Variable	Mean	Standard Deviation
<u>Amount of change advocated</u>		
$\bar{M}_1 - \bar{A}_1$	24.5	29.4
<u>Velocity</u>		
$\bar{A}_5 - \bar{A}_3$	3.9	24.5
$\bar{A}_3 - \bar{A}_1$	2.7	18.8
<u>Acceleration</u>		
$(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$	1.1	31.2
Correlation		
$\bar{M}_1 - \bar{A}_1$ with $(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$		$r = -.0130$ ( $p > .05$ )
CANCER FUNDS <sup>b</sup>		
Variable	Mean	Standard Deviation
<u>Amount of change advocated</u>		
$\bar{M}_1 - \bar{A}_1$	-65.9	98.9
<u>Velocity</u>		
$\bar{A}_5 - \bar{A}_3$	12.9	53.8
$\bar{A}_3 - \bar{A}_1$	-48.5	82.2
<u>Acceleration</u>		
$(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$	61.4	108.9
Correlation		
$\bar{M}_1 - \bar{A}_1$ with $(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$		$r = -.5874$ ( $p < .05$ )

<sup>a</sup>Units = students; n = 31.

<sup>b</sup>Units = \$ (millions); n = 33.

Table 3.--Continued.

CHARITY DONATIONS <sup>C</sup>		
Variable	Mean	Standard Deviation
<u>Amount of change advocated</u>		
$\bar{M}_1 - \bar{A}_1$	9.3	8.9
<u>Velocity</u>		
$\bar{A}_5 - \bar{A}_3$	1.0	10.6
$\bar{A}_3 - \bar{A}_1$	6.0	9.9
<u>Acceleration</u>		
$(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$	-5.0	16.6
<u>Correlation</u>		
$\bar{M}_1 - \bar{A}_1$ with $(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$		$r = -.6125$ ( $p < .05$ )

<sup>C</sup>Units = \$ (hundreds); n = 29.

the amount of change advocated. In each topic three additive tests were made. First, a zero-order correlation was made between frequency of interaction about a topic and acceleration. The theory would predict that this correlation would be significant and negative. Second, partial correlations were done between the amount of change advocated and acceleration controlling for frequency of interaction. The theory would predict that the correlation between amount of change advocated and acceleration controlling for frequency of interaction would be higher than when using a zero-order correlation. Third, a regression equation was tested using amount of change advocated and

frequency of interaction as independent variables and acceleration as the dependent variable. If the frequency of interaction acts upon acceleration then the  $\beta$  ought to be significant.

One interactive test was made for each topic. By comparing the zero-order correlation between the equation for inertial mass

$\left[ \frac{N(\bar{M}_1 - \bar{A}_1)}{N + 0} \right]$ , where  $N$  = the number of messages advocating a given position,  $0$  = the mass of old attitudes, and  $\bar{M}_1 - \bar{A}_1$  = the amount of change advocated] and acceleration with the zero-order correlation between the amount of change advocated and acceleration, one ought to see the influence of inertial mass. The correlation between inertial mass and acceleration ought to be stronger since mass should act as a resistor to acceleration and provide a more accurate picture. In other words, the simple amount of change advocated assumes no resistance to change resulting in a less accurate prediction of acceleration. In the interactive model the correlation between inertial mass and acceleration ought to be positive since the correlation between the amount of change advocated and acceleration is predicted by the model to be positive. This test would allow us to see how frequency of interaction interacts with the amount of change advocated to produce attitude change. Instead of looking at frequency of interaction as a variable that acts independently of advocated change (additive model), we could observe how it interacts with advocated change (interactive model).

Table 4 contains the set of correlations for all three topics.



TABLE 4.--Means, Standard Deviations, and Correlations for Amount of Change Advocated, Frequency of Interaction, and Inertial Mass for Three Topics.

CLASS SIZE AT MSU <sup>a</sup>			
Variable	Mean	Standard Deviation	
Frequency of interaction	5.5	7.9	
<u>Acceleration</u>			
$(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$	1.1	31.2	
<u>Amount of change advocated</u>			
$(\bar{M}_1 - \bar{A}_1)$	24.5	29.4	
Additive Model			
<u>Zero order correlations</u>		<u>Acceleration</u>	
Frequency of interaction		r = -.1459 sig. = .217	
Amount of change advocated		r = -.0130 sig. = .473	
<u>Partial correlation controlling for frequency of interaction</u>			
Amount of change advocated		r = -.0096	
<u>Multiple Regression</u>			
<u>Variable</u>	<u><math>\beta</math></u>	<u>Sig.</u>	<u>Simple r</u>
Amount of change advocated	-.0095	.960	-.0130
Frequency of interaction	-.1457	.443	-.1459
Overall multiple R =	.14620		
Overall R squared =	.02138		
Significance =	.739		
Interactive Model			
<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	
$\frac{N(\bar{M}_1 - \bar{A}_1)}{N + 0}$	10.9	18.2	
		<u>Acceleration</u>	
Inertial mass		r = .5041 sig. = .002	

<sup>a</sup>Units = students; n = 31.

Table 4.--Continued.

CANCER FUNDS <sup>b</sup>			
Variable	Mean	Standard Deviation	
Frequency of interaction	3.9	11.3	
<u>Acceleration</u>			
$(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$	61.4	108.9	
<u>Amount of change advocated</u>			
$(\bar{M}_1 - \bar{A}_1)$	-65.9	98.9	
<u>Additive Model</u>			
<u>Zero order correlations</u>		<u>Acceleration</u>	
Frequency of interaction		r = .1362 sig. = .225	
Amount of change advocated		r = -.5874 sig. = .001	
<u>Partial correlation controlling for frequency of interaction</u>			
Amount of change advocated		r = -.6126 sig. = .001	
<u>Multiple Regression</u>			
<u>Variable</u>	<u><math>\beta</math></u>	<u>Sig.</u>	<u>Simple r</u>
Amount of change advocated	-.6109	.001	-.5874
Frequency of interaction	.2058	.163	.1362
Overall multiple R =	.62199		
Overall R squared =	.38687		
Significance =	.001		
<u>Interactive Model</u>			
<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	
$\frac{N(\bar{M}_1 - \bar{A}_1)}{N + 0}$	-40.5	82.0	
		<u>Acceleration</u>	
Inertial mass		r = -.3872 sig. = .013	

<sup>b</sup>Units = \$ (millions); n = 33.

Table 4.--Continued.

CHARITY DONATIONS <sup>C</sup>			
Variable	Mean	Standard Deviation	
Frequency of interaction	1.8	3.2	
<u>Acceleration</u>			
$(\bar{A}_5 - \bar{A}_3) - (\bar{A}_3 - \bar{A}_1)$	-5.0	16.6	
<u>Amount of change advocated</u>			
$(\bar{M}_1 - \bar{A}_1)$	9.3	8.9	
<u>Additive Model</u>			
<u>Zero order correlations</u>		<u>Acceleration</u>	
Frequency of interaction		r = .2576 sig. = .089	
Amount of change advocated		r = -.6125 sig. = .001	
<u>Partial correlation controlling for frequency of interaction</u>			
Amount of change advocated		r = -.5889 sig. = .001	
<u>Multiple Regression</u>			
<u>Variable</u>	<u><math>\beta</math></u>	<u>Sig.</u>	<u>Simple r</u>
Amount of change advocated	-.5842	.001	-.6125
Frequency of interaction	.1255	.432	.2576
Overall multiple R =	.62463		
Overall R squared =	.39016		
Significance =	.002		
<u>Interactive Model</u>			
<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	
$\frac{N(\bar{M}_1 - \bar{A}_1)}{N + 0}$	6.9	7.2	
		<u>Acceleration</u>	
Inertial mass		r = - .5181 sig. = .002	

<sup>C</sup>Units = \$ (hundreds); n = 29.

For the class size topic, the additive model provides little support. First, the zero-order correlation between frequency of interaction and acceleration is in the predicted direction but not significant (-.1459). Second, the partial correlation between the level of advocated change and acceleration controlling for frequency of interaction is not stronger than the zero-order correlation between advocated change and acceleration (-.0130 zero-order and -.0096 partial correlation). Third, the regression equation was not significant and neither was the  $\beta$  for frequency of interaction. Thus, the additive model provides only weak support for the hypothesis.

The interactive model provides strong support for the hypothesis. The zero-order correlation between inertial mass and acceleration is .5041 and significant at the .002 level. The corresponding zero-order correlation between the amount of change advocated and acceleration is -.0130 and not significant. Thus, the interactive model provides strong support for the hypothesis.

For the cancer funds topic, the additive model provides little support for the hypothesis. First, the zero-order correlation between frequency of interaction and acceleration is in the opposite direction of the prediction (positive instead of negative), and it is insignificant. Second, the partial correlation between advocated change and acceleration controlling for frequency of interaction provides only suggestive support (-.5874 zero-order and -.6126 partial correlation). Third, the  $\beta$  for frequency of interaction in the regression equation is not significant. The equation is significant but the primary predictive power is from the level of advocated change.

The influence of frequency of interaction is trival. Thus, the additive model provides only weak support.

The interactive model provides no support: The correlation between inertial mass and acceleration is weaker than the correlation between advocated change and acceleration (-.5874 amount of change advocated and -.3872 inertial mass).

For the cancer funds topic, the relationship predicted finds very weak support.

For the charity donations topic, there is no support for the additive model. First, the zero-order correlation between frequency of interaction and acceleration is in the opposite direction of the prediction (positive instead of negative) and it approaches significance (.08). Second, the partial correlation between the amount of change advocated and acceleration controlling for frequency of interaction is not stronger than the zero-order correlation (-.6125 zero-order and -.5889 partial correlation). Third, the  $\beta$  for frequency of interaction in the regression equation is not significant. While the overall equation is significant, again all of its predictive power is a function of the amount of advocated change. Thus, the relationship is not significant when using the additive model.

The relationship is not significant using the interactive model either. The correlation between inertial mass and acceleration is not stronger than the correlation between the amount of change advocated and the amount of change obtained (-.6125 amount of change advocated and -.5889 inertial mass).

Thus, inertial mass seems to have little effect for the charity donations topic.

Overall, the hypothesis was not confirmed. The only significant finding was for the class size topic using the interactive model. The additive model provides little support for the hypothesis. These results would seem to indicate that inertial mass interacts with advocated change to influence acceleration rather than acting independently of it for one topic.

Hypothesis 5: There is a positive linear relationship between the number of messages (mass of messages) advocating a given amount of change and the rate of change obtained (measured as velocity).

This hypothesis was tested by looking at the mean percentage of change obtained at three intervals of time (interval<sub>1-2</sub>, interval<sub>2-3</sub>, and interval<sub>3-4</sub>). These three time intervals represent the intervals in which the message influence should be shown. The interval between time 1 and time 2 contained message 1. The interval between time 2 and time 3 contained message 2, and the interval between time 3 and time 4 contained message 3. The interval between time 4 and time 5 was not used because no message was sent in this interval.

Table 5A indicates the mean percentage of change obtained during each time interval.

The class size topic had the highest percentage of change in the interval between times 2 and 3 (15%) and the lowest percentage of change in the interval between times 1 and 2 (-3%).

TABLE 5A.--Mean Percent of Change Obtained by Time Interval.

Mean Percent of Change Obtained	Time Intervals		
	T <sub>1-2</sub>	T <sub>2-3</sub>	T <sub>3-4</sub>
Class size at MSU	-3%	15%	4%
Cancer funds	73%	-15%	34%
Charity donations	74%	-32%	16%

TABLE 5B.--Mean Attitude and Mean Message Position by Observation Number.

	Observation Number				
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
<u>Class Size at MSU</u> <sup>a</sup>					
Mean attitude	36.6	35.6	39.4	40.3	43.2
Mean message position	61.1	61.1	61.1	--	--
<u>Cancer Funds</u> <sup>b</sup>					
Mean attitude	162.9	112.1	114.4	108.3	127.3
Mean message position	96.9	96.9	96.9	--	--
<u>Charity Donations</u> <sup>c</sup>					
Mean attitude	11.6	18.4	17.6	18.1	18.6
Mean message position	20.9	20.9	20.9	--	--

<sup>a</sup>Units = students; n = 31.

<sup>b</sup>Units = \$ (millions); n = 33.

<sup>c</sup>Units = \$ (hundreds); n = 29.

The cancer funds topic has the highest percentage of change in the interval between times 1 and 2 (77%) and the lowest percentage of change between times 2 and 3 (-15%). These percentages seem to indicate that the relationship is not linear.

The charity donations topic had the highest percentage of change in the interval between times 1 and 2 (74%) and the lowest percentage of change between times 2 and 3 (-32%). Again, these percentages do not indicate a linear relationship.

Thus, the results do not support the hypothesis. What is indicated is that for two of the cases the greatest amount of change occurred with the first message that was given during the first interval of time. The least rate of change occurred during the second interval of time in which the second message was given.

As indicated in the discussion of Hypothesis 2, the mean percentage cannot be used in significance tests because of zero in the denominator. In order to test the relationship, albeit indirectly, the mean attitude was used in a treatment-by-subject or repeated-measures analysis of variance (see Table 5C). Again, treatment (column)  $F$ s are reported as well as treatment (column)  $\eta$ s. Where the  $F$ s were significant, the Scheffé method of selected comparisons was used.

For the class size topic, the treatment (column)  $F$  (1.29) was not significant at the .05 level and the  $\eta$  is not large (.134). The null hypothesis cannot be rejected. Further, the Scheffé method of selected comparisons is not appropriate. The hypothesis was not confirmed.



TABLE 5C.--Treatments-by-Subjects, or Repeated Measures ANOVA.

	Class Size at MSU	Cancer Funds	Charity Donations
Total sum of squares	61,204.84	727,500.00	13,297.24
Total degrees of freedom	154.00	164.00	144.00
Row sum of squares	33,564.84	378,000.00	6,697.24
Row degrees of freedom	30.00	32.00	28.00
Row mean squares	1,118.83	11,812.50	239.19
Row F	5.07*	5.33*	4.82*
Column sum of squares	1,137.10	65,871.21	1,040.34
Column degrees of freedom	4.00	4.00	4.00
Column mean squares	1.29	16,467.80	260.09
Column F	1.29**	7.43*	5.24*
Column $\eta$	.134	.30	.28
Column $\eta^2$	.018	.09	.08
Interaction sum of squares	26,502.90	283,628.79	5,559.66
Interaction degrees of freedom	120.00	128.00	112.00
Interaction mean squares	220.86	2,215.85	49.64

Scheffé Method of Selected Comparisons Using Mean  
Attitude and Mean Message Position

$\bar{A}_1$	162.88	11.55
$\bar{A}_2$	112.12	18.45
Sum of squares within	2,215.85	49.64
Standard error	11.59	1.85
Scheffé T	4.38	3.73
Critical F at .05	2.71	2.78
Critical Scheffé T Value	3.29	3.33
Scheffé T-Scheffé $T_\alpha$	1.09 <sup>†</sup>	.40 <sup>†</sup>
$\bar{A}_1$	162.88	11.55
$\bar{A}_3$	114.39	17.59
Sum of squares within	2,215.85	49.64
Standard error	11.59	1.85
Scheffé T	4.18	3.27
Critical F at .05	2.71	2.78
Critical Scheffé T value	3.29	3.33
Scheffé T-Scheffé $T_\alpha$	.89 <sup>†</sup>	-.06**

\*p &lt; .001.

\*\*p &gt; .05.

<sup>†</sup>p < .05.

Table 5C.--Continued.

	Class Size at MSU	Cancer Funds	Charity Donations
$\bar{A}_1$		162.88	11.55
$\bar{A}_4$		108.33	18.10
Sum of squares within		2,215.85	49.64
Standard error		11.59	1.85
Scheffé T		4.71	3.55
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29 <sup>†</sup>	3.33 <sup>†</sup>
Scheffé T-Scheffé T		1.42 <sup>†</sup>	.22 <sup>†</sup>
$\bar{A}_1$		162.88	11.55
$\bar{A}_5$		127.27	18.62
Sum of squares within		2,215.85	49.64
Standard error		11.59	1.85
Scheffé T		3.07	3.83
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29	3.33 <sup>†</sup>
Scheffé T-Scheffé T $\alpha$		-.22**	.50 <sup>†</sup>
$\bar{A}_2$		112.12	18.45
$\bar{A}_3$		114.39	17.59
Sum of squares within		2,215.85	49.64
Standard Error		11.59	1.85
Scheffé T		.19	.47
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29	3.33
Scheffé T-Scheffé T $\alpha$		-3.10**	-2.86**
$\bar{A}_2$		112.12	18.45
$\bar{A}_4$		108.33	18.10
Sum of squares within		2,215.85	49.64
Standard error		11.59	1.85
Scheffé T		.33	.19
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29	3.33
Scheffé T-Scheffé T $\alpha$		-2.96**	-3.14**

\*p &lt; .001.

\*\*p &gt; .05.

<sup>†</sup>p < .05.

Table 5C.--Continued.

	Class Size at MSU	Cancer Funds	Charity Donations
$\bar{A}_2$		112.12	18.45
$\bar{A}_5$		127.27	18.62
Sum of squares within		2,215.85	49.64
Standard error		11.59	1.85
Scheffé T		1.31	.09
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29	3.33
Scheffé T-Scheffé $T_\alpha$		-1.98**	-3.24**
$\bar{A}_3$		114.39	17.59
$\bar{A}_4$		108.33	18.10
Sum of squares within		2,215.85	49.64
Standard error		11.59	1.85
Scheffé T		.52	.26
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29	3.33
Scheffé T-Scheffé $T_\alpha$		-2.77**	-3.07**
$\bar{A}_3$		114.39	17.59
$\bar{A}_5$		127.27	18.62
Sum of squares within		2,215.85	49.64
Standard error		11.59	1.85
Scheffé T		1.11	.56
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29	3.33
Scheffé T-Scheffé $T_\alpha$		-2.18**	-2.77**
$\bar{A}_4$		108.33	18.10
$\bar{A}_5$		127.27	18.62
Sum of squares		2,215.85	49.64
Standard error		11.59	1.85
Scheffé T		1.63	.28
Critical F at .05		2.71	2.78
Critical Scheffé T value		3.29	3.33
Scheffé T-Scheffé $T_\alpha$		-1.66**	-3.05**

\*\*p &gt; .05.

For the cancer funds topic, the treatment (column) F (7.43) was significant at the .05 level and the  $\eta$  is large (.30). The null hypothesis can be rejected. The treatment means are significantly different. The Scheffé method of selected comparisons was used for the following:

$\bar{A}_2$  with  $\bar{A}_1$

$\bar{A}_4$  with  $\bar{A}_2$

$\bar{A}_3$  with  $\bar{A}_1$

$\bar{A}_5$  with  $\bar{A}_2$

$\bar{A}_4$  with  $\bar{A}_1$

$\bar{A}_4$  with  $\bar{A}_3$

$\bar{A}_5$  with  $\bar{A}_1$

$\bar{A}_5$  with  $\bar{A}_3$

$\bar{A}_3$  with  $\bar{A}_2$

$\bar{A}_5$  with  $\bar{A}_4$

Of these comparisons, only three were significant at the .05 level:

$\bar{A}_2$  with  $\bar{A}_1$

$\bar{A}_3$  with  $\bar{A}_1$

$\bar{A}_4$  with  $\bar{A}_1$

The hypothesis of linearity is not confirmed. Had the relationship been linear, we would expect to find significant differences throughout the comparison. The only significant comparisons involve  $\bar{A}_1$  with others. Thus, we cannot say a significant trend occurs with significant increases in attitude over time.

For the charity donations topic, the treatment (column) F (5.24) was significant at the .05 level and the  $\eta$  is large (.28). The null hypothesis can be rejected. The treatment means are significantly

different and the Scheffé method for selected comparisons was used for the following:

$\bar{A}_2$ with $\bar{A}_1$	$\bar{A}_4$ with $\bar{A}_2$
$\bar{A}_3$ with $\bar{A}_1$	$\bar{A}_5$ with $\bar{A}_2$
$\bar{A}_4$ with $\bar{A}_1$	$\bar{A}_4$ with $\bar{A}_3$
$\bar{A}_5$ with $\bar{A}_1$	$\bar{A}_5$ with $\bar{A}_3$
$\bar{A}_3$ with $\bar{A}_2$	$\bar{A}_5$ with $\bar{A}_4$

Only three comparisons were significant:

$\bar{A}_2$ with $\bar{A}_1$
$\bar{A}_4$ with $\bar{A}_1$
$\bar{A}_5$ with $\bar{A}_1$

Again, the linearity is not evident. The only significant differences are between  $\bar{A}_1$  and other attitudes. The change does not seem to be significant over time.

The overall results seem to indicate that the first message produced the greatest change. The preceding messages produced change but not significant change. Consequently, the relationship is not confirmed.

The control group's (n = 10) purpose was to serve as a check on the stability of the instruments. Two correlation coefficients were computed over time. First, a test-retest reliability check was computed for a one week period for (a) the attitude measures, and (b) the frequency of interaction measure. Second, a test-retest

reliability check was computed for the attitude measure over the course of the investigation (six weeks).

Table 6 indicates the test-retest correlation coefficients.

For the class size topic, the reliability of the attitude measure was high ( $r = .8320$ ) for the one week interval and for the six week interval ( $r = .8492$ ). The frequency of interaction measure proved to be less reliable than for the other topics ( $r = .3098$ ).

For the cancer funds topic, the reliability of the attitude measure approached significance ( $r = .4892$ , significance = .076) for the one week interval but proved to be unreliable for the six week interval ( $r = .3109$ ). The frequency of interaction measure was reliable for the one week interval ( $r = .7963$ ).

For the charity donations topic, the attitude measure proved to be reliable for the one week interval ( $r = .9467$ ) and for the six week interval (.8370). The measure of frequency of interaction proved to be equally reliable ( $r = .9289$ ).

The reliability measures indicate overall that the attitude measures are reliable for one week intervals. When used with a five week interval, the cancer funds measure is not reliable. The frequency of interaction measure is reliable for the one week interval except for the class size topic.

In summary, only two of the hypotheses were supported:

Hypothesis 1: There is a positive linear relationship between the amount of change advocated in a message and the absolute rate of change obtained (measured as velocity).

Hypothesis 2: There is a positive linear relationship between the amount of change advocated in a message and the relative rate of change obtained (measured as velocity).

TABLE 6.--Control Group Means, Standard Deviations, and Correlations  
for Velocity and Inertial Mass for Three Topics.

CLASS SIZE AT MSU		
Variable	Mean	Standard Deviation
Attitude time 1	34.5	17.4
Attitude time 2	38.5	25.3
Attitude time 5	34.5	15.9
Time 2 - Time 1	4.0	14.5
Time 5 - Time 1	0.0	7.1
<u>Frequency of interaction</u>		
Time 1	5.0	5.8
Time 2	5.0	6.4
Correlation		
Attitude time 1 with attitude time 2 = .8320		
sig. = .001		
Attitude time 1 with attitude time 5 = .8492		
sig. = .001		
Frequency of interaction time 1 with frequency of interaction time 2 = .3098		
sig. = .192		

Table 6.--Continued.

CANCER FUNDS		
Variable	Mean	Standard Deviation
Attitude time 1	205.0	82.3
Attitude time 2	202.5	89.3
Attitude time 5	190.0	94.4
Time 2 - Time 1	-2.5	86.9
Time 5 - Time 1	-15.0	104.2
<u>Frequency of Interaction</u>		
Time 1	3.9	7.4
Time 2	3.4	4.8
<u>Correlation</u>		

Attitude time 1 with attitude time 2 = .4892

sig. = .076

Attitude time 1 with attitude time 5 = .3109

sig. = .191

Frequency of interaction time 1 with  
frequency of interaction time 2 = .7936

sig. = .003



Table 6.--Continued.

CHARITY DONATIONS		
Variable	Mean	Standard Deviation
Attitude time 1	22.5	12.9
Attitude time 2	22.0	13.6
Attitude time 5	20.5	9.6
Time 2 - Time 1	-.15	4.4
Time 5 - Time 1	-2.0	7.5
<u>Frequency of interaction</u>		
Time 1	1.9	2.6
Time 2	1.8	2.9
Correlation		
Attitude time 1 with attitude time 2 = .9467		
sig. = .000		
Attitude time 1 with attitude time 5 = .8370		
sig. = .001		
Frequency of interaction time 1 with		
frequency of interaction time 2 = .9289		
sig. = .000		

Hypothesis 3 was not supported. Instead, a negative linear relationship was found between the amount of change advocated and the absolute amount of change obtained (measured as acceleration).

Hypothesis 4 received only minimal support. There was no support for an additive relationship between inertial mass and acceleration. The only support was for an interactive relationship. This support was limited to one topic of the three.

Hypothesis 5 was also not confirmed. Instead of a linear change taking place for every message, the greatest change took place for the first message with decreasing amounts of change for each succeeding message.

Thus, two of the five hypotheses were confirmed. The next chapter will discuss these results.

## CHAPTER IV

### DISCUSSION

This chapter will discuss four sets of issues resulting from this investigation: theoretical issues, methodological issues, future research issues, and practical issues. The theoretical issues will focus on the impact of the results on Woelfel's model. The methodological issues will focus on the impact of the study design on future longitudinal studies. The future research issues will focus on potential research generated from this study, and the practical issues will indicate the utility of the research to everyday application.

#### Theoretical Issues

The confirmation of the first hypothesis provides support for the applicability of Woelfel's model to the study of the relationship between the amount of change advocated and the amount of attitude change obtained. For short intervals of time (one week) and for long intervals of time (2-5 weeks) the relationship between the amount of change advocated and velocity is positive and linear.

Three deviant cases exist for the short term and two are in the same topic: class size at MSU. In both cases, a large number (84%) of people did not change their attitude at all. A possible explanation is that this particular topic is one about which people

have a relatively high inertial mass. Although inertial mass is not directly related to velocity in Woelfel's model, it is related to acceleration. For this particular topic the average level of inertial mass is the highest of the three (5.5 hours/month). Further, the relationship between inertial mass and acceleration is confirmed for this topic (using the interactive model). It is possible that mass may only indirectly affect velocity.

The other short term deviant case and only long term deviant case were in the charity donations topic. In these cases there were also a large number (45%) of people who did not change their attitudes. However, the mean inertial mass was low for this topic (1.8 hours/month) and the relationship between the inertial mass and acceleration was not significant. The explanation in this case may be due to the amount of change that could be obtained. The long and short term correlations that were not significant were in the later velocities:

Short Term

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_3 - \bar{A}_1$$

Long Term

$$\bar{M}_3 - \bar{A}_3 \text{ with } \bar{A}_5 - \bar{A}_3$$

These correlations were preceded by significant correlations. It is possible that the first two messages resulted in large changes so that many of the subjects had reached the message position before the third message was presented. Thus, these subjects would have no reason or room to change. The mean attitude at each of the time periods tends to support this analysis. The mean message position was

20.9 for all three messages (units = hundreds of dollars). The mean attitude at time 1 was 11.6. At time 2 the mean attitude had changed to 18.4. At time 3 the mean attitude was 17.6, and at time 4 the attitude was 18.1. Thus, at each time period after the first message most subjects could not move closer to the message position without going beyond it.

For the majority of the correlations the hypothesis was confirmed; i.e., the relationship between the amount of change advocated and velocity is positive and linear. In the cases where the hypothesis was not confirmed, either the theory or the methodology provides viable explanations of them.

We found support for a positive linear relationship between the amount of change advocated and the relative rate of change. The hypothesis found support in two of the topics: cancer funds and charity donations. This finding runs contrary to the two previous findings investigating relative rate of change. Goldberg (1954) found a consistent relative change of 30% at all levels of advocated change. Hovland and Pritzker (1957) found a negative linear relationship between the amount of change advocated and the relative rate of change. They found a relative rate of 88% for small amounts of advocated change, 62% for moderate amounts of advocated change, and 58% for large amounts of advocated change. Our findings suggest that the relationship is positive and linear.

The deviant case is the class size at MSU topic. For this topic the relationship seemed curvilinear with the greatest change at moderate levels of advocated change and smaller changes at small and

large amounts of advocated change. As indicated earlier, this was the same topic that had the highest mean level of inertial mass. It is possible that inertial mass acted as a resistor to the relative rate of change as well.

When we investigated the mean change per unit advocated, the positive linearity apparent in the mean percent of change was equally apparent in this variable. The cancer funds topic and the charity donations topic showed significant differences across levels of advocated change in mean change per unit advocated. The class size at MSU topic had no significant differences between levels of advocated change. Essentially, this topic showed very little change across time periods.

It would seem that the use of relative change may be useful in looking at the relationship between the amount of change advocated and amount of change obtained. It supports the finding in Hypothesis 1: the relationship is positive and linear for two of the topics.

The results of Hypothesis 3 were surprising because they were the opposite of the predicted relationship. The theory predicted a positive linear relationship between the amount of change advocated and acceleration. The results indicate that the relationship is negative linear; i.e., as the amount of change advocated increases, the acceleration decreases.

Two explanations may be posited about this finding. Based upon these data, Woelfel and Saltiel (1974) recently argued for the existence of the inverse squares law. This law argues that while the amount of force of a message is directly proportional to the amount

of change advocated, this does not mean that the change resulting from its force will be instantaneous. In other words, it may be the case that as the amount of advocated change increases the time required for the total resulting amount of change to appear also increases. If this law holds we would expect small amounts of advocated change to produce immediate amounts of attitude change, while large amounts of advocated change would not produce all of the resulting attitude change until a delayed, later point. In order to see if this explanation is possible, it is necessary to look at the correlations between the amount of change advocated and the short and long term velocities which affect acceleration. Acceleration is the change in the velocities. The amount of change advocated was the initial amount of change advocated for the first message. Listed below are the correlations between this amount of change advocated and the short and long term velocities for the three topics:

	<u>Short Term</u>	<u>Class Size</u>	<u>Cancer Funds</u>	<u>Charity Donations</u>
(1) $\bar{M}_1 - \bar{A}_1$ with $\bar{A}_2 - \bar{A}_1$	.5717	p<.05	.8521	p<.05
(2) $\bar{M}_1 - \bar{A}_1$ with $\bar{A}_3 - \bar{A}_2$	-.2122		-.1578	.3026 p<.05
(3) $\bar{M}_1 - \bar{A}_1$ with $\bar{A}_4 - \bar{A}_3$	.1308		.1072	-.2485
	<u>Long Term</u>			
(4) $\bar{M}_1 - \bar{A}_1$ with $\bar{A}_3 - \bar{A}_1$	.5236	p<.05	.8385	p<.05
(5) $\bar{M}_1 - \bar{A}_1$ with $\bar{A}_5 - \bar{A}_3$	.3852	p<.05	.0910	-.2383

The time difference between the presentation of the message and the post-test attitude measure varies from ten minutes in the first velocity to two weeks in the third velocity. If the inverse squares law

holds we would expect the correlations to decrease and become negative as the time difference increases. The first three correlations are for short term intervals. The pattern is consistent between the first two intervals. In all three topics, the correlations decrease in the second time interval (one week since the first message) and two become negative (class size,  $r = -.2122$ ; cancer funds,  $r = -.1578$ ; charity donations,  $r = .3026$ ). When one looks at the third interval (two weeks since the first message), the correlations are still smaller than the first one but reverse themselves in sign (class size,  $r = .1308$ ; cancer funds,  $r = .1072$ ; charity donations,  $r = -.2485$ ).

When looking at the fourth and fifth velocities we can see if the same pattern holds using a larger measure of velocity. In all three topics, the correlations decrease from the first interval to the second and one reverses itself in sign.

While most of these correlations are not significant, a trend is apparent: as the time interval between the message and the attitude post-test increases the correlations between advocated change and velocity decrease, and in some cases, reverse signs. This does not confirm the inverse squares law but provides some partial support for it.

The second explanation regarding the third hypothesis is similar in focus. This explanation would argue that the multiple messages act as resistors to change beyond the advocated level. In this study each subject received three messages advocating a given level of change. While these messages acted as a force to change the old



attitude, they also began forming a mass for the new attitude. As the number of messages increased, they formed a ceiling beyond which subjects would not move. In other words, the messages went from advocating change to sustaining an attitude. If this explanation is true, we would expect large initial changes resulting from the initial amount of change advocated and smaller increments of change afterwards. Previous analysis regarding Hypothesis 5 supports this idea (see Chapter III). Further, we would expect each level of change advocated to become smaller as the person's attitude moves closer to the message position. This is also supported by Hypothesis 5. Since the later and smaller velocities are used to compute the acceleration, we would expect the later and smaller amounts of advocated change to correlate positively with them. Below are listed the correlations between the later amounts of advocated change and acceleration:

	<u>Class Size</u>	<u>Cancer Funds</u>	<u>Charity Donations</u>
$\bar{M}_2 - \bar{A}_2$ with acceleration	.4246 p<.05	-.1780	-.2771
$\bar{M}_3 - \bar{A}_3$ with acceleration	.4467 p<.05	.2606	.3892 p<.05

The results provide partial support for the explanation. The strongest support comes from the  $\bar{M}_3 - \bar{A}_3$  level of advocated change. While this level of advocated change provides consistent directional support for the hypothesis, the other does not.

Both explanations are partially supported by the data. It would seem that the best method of solving the problem is to replicate the study using a different design allowing us to see if the results remain the same.

Hypothesis 4 was not supported. In only one case does inertial mass seem to be a significant resistor to acceleration. This case was supported using the interactive model but not the additive model. The additive model provided no support for the relationship.

There are two possible explanations for these findings. First, the measurement of inertial mass may be bad. While the measurement was reliable, it may have only partially tapped the construct. It did not take into consideration things such as observation of events which may influence a person's resistance to change.

Second, the attitudes chosen may be so low in inertial mass that it really does not make a difference. The theory may only apply to situations in which a person has an inertial mass beyond some minimum or threshold level, i.e., only if inertial mass is high will it resist acceleration.

Hypothesis 5 was not supported. Instead of a linear increase in attitude change with subsequent messages, we found that the largest amount of attitude change tended to take place as a result of the first message. After the first message the change tended to become smaller and the attitude tended to stabilize.

This research supports the applicability of Woelfel's theory to the study of the relationship between the amount of change advocated and the amount of change obtained. The theory is able to predict accurately and when it can't, explanations can be drawn from the theory or from modifications of the theory about the unexpected findings. The theories that were criticized previously (Dissonance theory, Group Norm theory, and Social Judgment Approach) had all

produced inconsistent findings. In order to explain these findings the theories were modified and were still unable to predict a consistent finding. The only methodological problem with Woelfel's theory is that of measuring inertial mass. While initially we indicated that this might be part of the advantage of using Woelfel's theory, that statement needs modification. Most variables in Woelfel's theory can be readily operationalized. Inertial mass as a concept needs more development.

Overall, the theory may need some expansion to cover some new findings; specifically, the relationship between advocated change and acceleration, the relationship between inertial mass and acceleration, and the relationship between multiple messages and attitude change. The theory's applicability to the relationship between the amount of change advocated and velocity is sound. A wholesale revision of the theory should not be undertaken given only these results; some methodological problems took place within this study which need to be considered.

#### Methodological Issues

Three general problems were found in this longitudinal study: sensitization, regression effects, and attrition.

The sensitization problem is difficult to observe and to overcome. After filling out five questionnaires and reading three messages, subjects are likely to determine what the study is about; this may systematically bias the results in one way or another. Given this likelihood, we attempted to minimize any response bias because of sensitization.

We used three methods to overcome sensitization. First, subjects were told that the project was completely voluntary and that if they wished they could refrain from being part of it. The message was presented by the instructors of the classes and by the experimenters. Subjects were also told that the project would take place over six weeks, but they were not told when experimenters would be in their classes. Thus, attempts were made to give the subjects a true picture of what would be happening and allow those who wished the opportunity to drop out at the beginning of the project.

Second, the subjects were told that this was a survey being done in conjunction with another Communication 100 class. That survey was purportedly done to determine students' attitudes on a number of issues and to get their reaction to several messages about those attitudes. The offer was also made to allow them to survey other Communication 100 classes for their own group projects.

Third, we made the decision to assign messages randomly to classes rather than to individuals in order to avoid sensitizing subjects to the message treatments. If subjects in a class had received the same messages except for the advocated position, this probably would have been discovered before the end of the experiment, six weeks later.

Unfortunately, there is no way to discern the effect of sensitization on the results. From observation of the students it seemed that success was achieved in counteracting any bias. Few students refused to be part of the experiment and those few refused early in the experiment. While the attrition rate was large, it was attributable to other factors which will be discussed later.

The second methodological problem was regression effects. Other researchers have indicated that the linearity finding is a function of the tendency for subjects at the extreme positions on a pretest to regress toward the mean. Since they move farther than those at moderate positions, the effect is to give the impression that the movement is larger at the more extreme levels of advocated change. This problem has existed in a number of studies investigating the relationship between the amount of change advocated and the amount of change obtained (see Insko, 1967; and Kiesler, Collins, and Miller, 1969).

An attempt was made to control for regression effects. A control group was used to look at the attitudes over time to see how much they varied without a message. The reliability test indicated that the variation was not significant. Although no significance test should be run between the experimental groups and the control group ( $n = 10$  in control group), simple observation of the changes indicated that there was systematic variation in the experimental group but not in the control group.

Unfortunately, however, there is no way to know if the regression effects are controlled for since change due to regression looks the same as change due to the amount of change advocated. An attempt was made in the design to control them; the attempt may have been successful.

The third methodological problem is a typical one for longitudinal studies: attrition. The attrition rate for the five observations was large. We were able to match 89 subjects for time 1 and time 2 but only 30 subjects for all five observations.

A major cause of this attrition was absenteeism. As indicated earlier, subjects were told that the experiment would be over a six week period but they were not told what days the questionnaires would be administered. No special day was allocated for the questionnaire administration. The only rule was that it should be administered either Monday, Wednesday, or Friday. Given this procedure, it would seem likely that the attrition was not due to hostility but simply absenteeism. Subjects needed to miss only one class in the sequence of five and their questionnaires would not be usable. The absenteeism rate in Communication 100 in the Spring Quarter seemed to be higher than in other quarters.

In order to take into consideration possible differences that exist between people who were there for time 1 and time 2, a table was constructed consisting of three groups: those people who were just tested on times 1 and 2, those people who were tested on all five times, and the combination of those two groups. The mean attitude scores for time 1 and time 2, the mean attitude change score for that time interval, the mean amount of change advocated for that interval, the correlation between the amount of change advocated, and the amount of change obtained and the mean percent of change obtained are listed in Table 7A for all three groups and all three topics. A quick survey of the means and standard deviations indicates that there are differences between the drop outs and those who remained. For the class size topic, the drop outs numbered 52 and those who remained numbered 31. The mean amount of change advocated (drop out = 32.2; those remaining = 24.5) and the mean amount of change obtained

TABLE 7A.--Means, Standard Deviations, and Correlations for Drop Outs, People Who Stayed In, and Both Combined

	Drop Outs After Time 2	Drop Outs + Stay Ins	Stay Ins
<u>Class Size at MSU<sup>a</sup></u>	n = 52	n = 83	n = 31
"Should" attitude time 1			
Mean	38.1	37.5	36.6
Standard deviation	29.1	25.4	17.9
"Should" message			
Mean	70.4	66.9	61.1
Standard deviation	22.5	23.3	23.8
"Should" attitude time 2			
Mean	33.4	34.2	35.6
Standard deviation	16.3	15.6	14.6
$\bar{A}_2 - \bar{A}_1$			
Mean	-4.7	-3.3	-.9
Standard deviation	27.2	25.1	21.5
$\bar{M}_1 - \bar{A}_1$			
Mean	32.3	29.4	24.5
Standard deviation	41.7	37.6	29.4
r			
$\bar{M}_1 - \bar{A}_1, \bar{A}_2 - \bar{A}_1$	.7655	.7040	.5717
Significance	.000	.000	.004
Percent of change obtained	-14.5	-11.2	-3.0
<u>Cancer Funds<sup>b</sup></u>	n = 49	n = 82	n = 33
"Should" attitude time 1			
Mean	154.1	157.6	162.9
Standard deviation	88.3	86.7	85.3
"Should" message			
Mean	136.7	120.7	96.9
Standard deviation	56.2	53.8	40.4
"Should" attitude time 2			
Mean	140.3	128.9	112.1
Standard deviation	72.9	67.9	56.6
$\bar{A}_2 - \bar{A}_1$			
Mean	-13.8	-28.7	-50.8
Standard deviation	83.1	87.9	91.3

<sup>a</sup>Units = students.

<sup>b</sup>Units = \$ (millions).

Table 7A.--Continued.

	Drop Outs After Time 2	Drop Outs + Stay Ins	Stay Ins
<u>Cancer Funds, continued</u>	n = 49	n = 82	n = 33
$\bar{M}_1 - \bar{A}_1$			
Mean	-17.3	-36.9	-65.9
Standard deviation	107.6	106.3	98.9
r			
$\bar{M}_1 - \bar{A}_1, \bar{A}_2 - \bar{A}_1$	.6867	.7620	.8521
Significance	.000	.000	.000
Percent of change obtained	79.2	77.6	77.0
<u>Charity Donations<sup>C</sup></u>	n = 48	n = 77	n = 29
"Should" attitude time 1			
Mean	15.9	14.3	11.6
Standard deviation	12.3	10.8	7.2
"Should" message			
Mean	26.7	24.5	20.9
Standard deviation	11.5	10.4	6.9
"Should" attitude time 2			
Mean	18.0	18.2	18.4
Standard deviation	10.4	10.8	11.7
$\bar{A}_2 - \bar{A}_1$			
Mean	2.1	3.9	6.9
Standard deviation	16.0	14.7	11.8
$\bar{M}_1 - \bar{A}_1$			
Mean	10.7	10.2	9.3
Standard deviation	19.6	16.3	8.9
r			
$\bar{M}_1 - \bar{A}_1, \bar{A}_2 - \bar{A}_1$	.7322	.6498	.3952
Significance	.000	.000	.017
Percent of change obtained	19.5	38.8	74.0

<sup>C</sup>Units = \$ (hundreds).



(drop out = 4.7; those remaining = -.9) differ between the two groups. The standard deviations are similar for the amount of change obtained (drop out = 27.2; those remaining = 21.5) but not for the amount of change advocated (drop out = 41.7; those remaining = 29.4).

For the cancer funds topic, the drop outs numbered 49 and those who remained numbered 33. The mean amount of change advocated (drop out = -17.3; those remaining = -65.9) and the mean amount of change obtained (drop out = -13.8; those remaining = -50.8) differed, as did the standard deviations for the two groups (change advocated--drop out = 107.6; those remaining = 98.9; change obtained--drop out = 83.1; those remaining = 91.3).

For the charity donations topic, the drop outs numbered 48 and those who remained numbered 29. Again the means and standard deviations for the two groups differed for the amount of change obtained (drop out  $\bar{X} = 2.1$ , standard deviation = 16.0; those remaining  $\bar{X} = 6.9$ , standard deviation = 11.8) and the amount of change advocated (drop out  $\bar{X} = 10.7$ , standard deviation = 19.6; those remaining  $\bar{X} = 9.3$ , standard deviation = 8.9).

However, the key question is how did these differences affect the relationship between the amount of change advocated and the amount of change obtained. In other words, did these differences affect the correlations between the amount of change advocated and the amount of change obtained. In order to compare the differences between the relationships for the drop outs and those who remained, we examined two tests. First, we examined the significance level of the correlations to see if they differed. It should be remembered that the .05

level of significance was chosen for the correlations. For the class size topic the correlation was significant at the .001 level for the drop outs and at the .004 level for those who remained. These significance levels are far beyond the .05 level for the correlations. If we had reported either set of data for the first two times, the relationship would have been positive and linear and subsequently would have confirmed the hypothesis.

The cancer funds topic showed a similar relationship. The correlation for the drop outs was significant at the .001 level and the correlation for those who remained in the study was also significant at that level. Again, regardless of the data set, the hypothesis would have been confirmed.

The charity donations topic also indicates that the correlations were significant for those who dropped out and those who remained. The correlation for the drop outs was significant at the .001 level and the correlation for those who remained was significant at the .017 level.

Using the significance level of the correlation as the criterion of difference, the analysis indicates that regardless of whether the subjects drop out or remain, the relationship remains the same: positive and linear.

The second test comparing the drop outs with those who remained involved a test for differences between the correlations themselves. Table 7B indicates the results of this test.

While the correlations are different in all cases, they are only significantly different in one case (charity donations). In the

TABLE 7B.--Test for Differences Between Correlations.

	r	Fisher Z Transformation	Z	Significance
<u>Class Size at MSU</u>				
Drop outs	.766	1.008		
Remaining	.572	.648	1.538	p > .05
<u>Cancer Funds</u>				
Drop outs	.687	.838		
Remaining	.852	1.256	1.780	p > .05
<u>Charity Donations</u>				
Drop outs	.732	.929		
Remaining	.395	.418	2.063	p < .05

deviant case, the individual correlations are both significant. Further, the relationship tends to be stronger with people who drop out as opposed to those who remain ( $r = .7322$  for drop outs;  $r = .3952$  for those remaining). Thus, the people who remained in the study showed a weaker correlation, but it is still a significant one.

On the basis of those two tests, the relationship is not dramatically altered by comparing drop outs with those who remained. The first hypothesis would have been confirmed regardless of which group was reported.

The mean percentage was different for drop outs and those who remained in two of the topics. For class size at MSU the mean percent of change obtained was -14.5% for drop outs and -3% for those who remained. While one cannot do a significance test between the two means because of zeros in the denominator, it does appear that a

significant difference exists. The same pattern is apparent in the charity donations topic. In that case, the mean percent is 19.5% for the drop outs and 74% for those who remained. The deviant case is the cancer funds topic in which the mean percent is 79.2% for the drop outs and 77% for those who remained. Thus, the second hypothesis had some differences between people who dropped out and those who remained.

Overall, a case can be made that attrition did not significantly affect the results of Hypothesis 1. Unfortunately, there is no way to determine the extent of bias introduced through attrition. Thus, no definitive answer is possible.

#### Future Research Issues

There are at least four major research projects suggested by this investigation. First, a replication of this study is warranted using a different design. Such a design should be able to retest the hypotheses of this study while controlling for methodological problems that occurred. Further, the design should be strong enough to allow us to investigate other hypotheses arising from this study. The major problem with the study was attrition. As indicated earlier, this is a difficult problem. A partial solution to this problem would entail the use of rewards to the subjects for attending a session outside of class. The project could follow this pattern:

A pretest of intact groups would be done (probably in a beginning Communication course). On the basis of the pretest, subjects would be placed into different groups based on the similarity of their

initial attitude. For example, persons with an attitude that convicted rapists should receive 12 years in prison would be put into a group with people who believe the rapist should receive 10-15 years. An attempt would be made to make the groups equivalent in size. After this formation of groups, subjects would be approached and offered a reward (money or point toward their grade) for coming to five meetings outside class. In these meetings subjects would receive the messages and questionnaires, just as they did in this investigation. The reward would be given at the end of the fifth session if the subject attended all five sessions. Such a design would have three advantages. First, by putting people into individual groups on the basis of their initial attitude one could better control regression effects. By randomly assigning messages within each group, one can make a number of comparisons: (a) one could compare messages in terms of their effect for different attitude position; (b) one could look at overall changes resulting from all the messages in one group with the other groups. By making these comparisons, one could look to see if some groups changed more toward the mean than others or, in other words, check for regression effects.

The second advantage would be better control over the influences resulting from intact classroom groups. These influences are diverse and uncontrollable. While this design would not be able to control all influences, it would help to eliminate some.

The third advantage is that this design would help negate the attrition. Paying subjects after they have completed all five

times would help insure their attendance, much better than risking attendance in class.

The problems with this design are twofold: First, it requires the use of many facilities. For example, it assumes the use of a number of rooms in which to hold the sessions as well as the use of some kind of rewards. If money or influence over grades are lacking, the incentive to attend the sessions is low. Second, the incentives may bias the results. Paying subjects introduces the possibility of biasing them; they may be compelled to respond the way they think the experimenter wants them to.

Despite the problems associated with these design changes, this study should be replicated making the suggested adjustments.

Second, a study should investigate the inverse squares law. Such a study could be incorporated into the one suggested above. Instead of giving three messages to subjects over five time periods, one could take an attitude, only give one message, and measure the change over five times. If the inverse squares law holds, we would expect to find the correlations becoming smaller and negative as the time between the message and the post-tests increased.

Third, a study should be designed in which message position would become higher each time the message was presented, allowing us to further investigate Woelfel's theory. In other words, instead of giving subjects three messages advocating the same level, one would provide three messages to the subjects which advocated increasing positions. The explanation provided for the negative correlation between the advocated change and acceleration would not hold, since

the messages would not increase the mass of any one position because they are always increasing.

Fourth, a study should be designed using a different set of topics which are likely to be of higher inertial mass. This study investigated topics in which the mass of the attitude was low. We found in this study that the relationships are linear. It strikes us that the relationships should be studied in cases where there is a great deal of information about the topics. This information may resist attitude change enough to change the relationship.

Finally, a study should be done to explicitly examine the amount of change received for a given amount advocated. Instead of looking at the nature of the relationship we would predict a given amount of change obtained from a given amount advocated. For example, if one asks \$300 for a used car, how much will one get? Further, if I want \$300, how much more should I ask for in order to get that amount? This project goes beyond Woelfel's model into a "bargaining model" but our study certainly suggests that it should be investigated.

#### Practical Issues

There are four implications for a practitioner to be observed from this investigation. First, the greatest absolute amount of attitude change and relative amount of attitude are attained by advocating large amounts of attitude change. When one wishes to persuade an audience it is advisable that one should obtain an estimate of the audience opinion. On the basis of that opinion one should adopt a position that is very different from that of the audience, if the goal of the persuasive effort is to attain the largest amount of attitude

change possible. If one only wants moderate shifts in opinion then one should adopt a position only moderately different from the audience opinion and if one wants only small shifts in attitude, then only positions that are slightly different than those of the audience. It should be noted that one should adopt this approach if one has only infrequent contacts with one's audience. If one is able to have frequent contact with subjects one would want to consider my second implication. The results of this study indicate that the amount of change obtained from a message will conform to the amount of change advocated.

The second implication is that if one is concerned with changing the rate of an audience's attitude then the greatest rate of attitude change is obtained from a small amount of change advocated. In other words, if one is concerned with the rate of change over a long period of time then one would be advised to advocate small amounts of attitude change in order to produce the largest rate of attitude change. Again, the practitioner should gather an estimate of the audience's attitudes and design a message that is not very different from the audience's attitude. The rate of attitude change would be most rapid using this method. Before one should adopt this strategy one should have the ability to frequently contact the audience. For example, if one is only able to communicate to an audience, say, once a week, one should follow implication one, i.e., advocate an extreme position. If however, one is able to frequently contact an audience, i.e., every hour for a week's time, then one should follow implication two, or advocate a number of increasing small changes.



Since the rate of change increases fastest when using small amounts of advocated change, we would expect the rate of change to be higher. The key idea is that for messages that are small in the degree of their advocated position, we would expect their impact to be instantaneous. If we can contact people many times, we can keep the rate of change increasing as we slowly increase the message position. Since larger amounts of advocated change result in slower change, we only want to use them when we can only communicate a few times. The rate of attitude change would be important when changing attitude over a longer period of time. If one is only concerned with a small period of time then the amount of attitude change is important and the first implication is applicable.

The third implication is that large amounts of information that a person has about a topic acts as a resistor to attitude change. In other words, the practitioner should be concerned about how much information the audience has about the attitude to be changed. This investigation indicates that if a person has a large amount of information about a topic then the rate of attitude change will be resisted. However, at small levels of information the relationship is not clear. In some cases, the small amount of information an individual has about a topic has no influence on the rate of attitude change at all.

The final implication is that most attitude change is obtained by one message and that more messages result in smaller amounts of attitude change. If one is persuading a group then the first message results in a great deal of attitude change and further messages

advocating a given level of change will result in much smaller amounts of change. Even though the later messages may advocate change, the amount of advocated change is smaller and subsequent amounts of obtained change is less. If the practitioner is concerned with changing attitudes and reinforcing that attitude then more than one message is desirable. The first message results in most of the attitude change and further messages tend to reinforce the new attitude.

### Conclusions

This thesis explored the relationship between the amount of change advocated in a message and the amount of change obtained. The theoretical base was Woelfel's Linear Force Aggregation Theory. Five hypotheses were derived from this theory:

- Hypothesis 1: There is a positive linear relationship between the amount of change advocated in a message and the absolute rate of change obtained (measured as velocity).
- Hypothesis 2: There is a positive linear relationship between the amount of change advocated in a message and the relative rate of change obtained (measured as velocity).
- Hypothesis 3: There is a positive linear relationship between the amount of change advocated in a message and the absolute change in the rate of attitude change obtained (measured as acceleration).
- Hypothesis 4: There is a negative linear relationship between the amount of information a person has about a topic and the amount of attitude change obtained (measured as acceleration).
- Hypothesis 5: There is a positive linear relationship between the number of messages (mass of messages) advocating a given amount of change and the rate of change obtained (measured as velocity).

These hypotheses were tested in an over-time design. Over a six week period, subjects from a beginning Communication 100 class at

Michigan State University received three messages and five questionnaires about three topics. Each of the three messages advocated a given level of attitude change. The time intervals were compared to look at the amount of attitude change as a function of the amount of advocated change.

Only Hypotheses 1 and 2 were confirmed. Instead of a positive linear relationship between the amount of change advocated and acceleration, a negative linear relationship was observed. Thus, Hypothesis 3 was not supported. Hypothesis 4 received only slight support. There was no support for an additive relationship between inertial mass, the amount of change advocated, and acceleration. Only one topic showed a significant interactive relationship between inertial mass and acceleration. Hypothesis 5 received no support. Instead of finding a uniform linear increase in attitude change with each succeeding message, it was found that only the first message provided significant changes.

This study provided some support for Woelfel's position. However, some methodological problems may have existed: sensitization of subjects, regression effects, and attrition.

## APPENDICES

APPENDIX A  
QUESTIONNAIRE

COMMUNICATION 100 SURVEY

As you know, one of the activities you will engage in this term is an analysis of a significant social problem. The purpose of this survey is to solicit the opinions of Communication 100 students on a variety of current issues--campus and national--which may serve as the foci of the problem analysis. On the following pages you will find a number of issues asking you to make judgments about them in terms of what you perceive they are and what you think they should be. Here's an example:

What do you think is the average prison sentence given to a man convicted of robbery in the U.S.? (What should it be?)

<u>IS</u>		<u>SHOULD BE</u>
_____	4 years	_____
_____	8 years	_____
_____	12 years	_____

Your job is to place a check in the blank which best expresses what you think the sentence is on the left column and a check in the blank which best expresses what you think the sentence should be on the right column. For example, if you think that the sentence is four years, and it should be twelve years, you would mark the question as follows:

What do you think is the average prison sentence given to a man convicted of robbery in the U.S. (What should it be?)

<u>IS</u>		<u>SHOULD BE</u>
<u>X</u> _____	4 years	_____
_____	8 years	_____
_____	12 years	<u>X</u> _____

Below each question are two questions asking who you talk to about each topic and how often you talk to each of them about it. For example, if you talk to Bob Smith 5 hours/month and if you talk to Ted Jones 4 hours/month, you would mark the question as follows:

Who have you talked to in the past about this and related topics? <u>Bob Smith</u> _____	On the average, how often have you talked to these people about this and related topics? 0 1 2 3 4 <u>X</u> 5 6 7 8 9 10 11 12 13+ hours/month
_____ <u>Ted Jones</u> _____	0 1 2 3 4 <u>X</u> 5 6 7 8 9 10 11 12 13+ hours/month

REMEMBER: Put down only one check per column. Answer both columns for each.

1. How long is the average prison sentence for a rape conviction in the U.S.? (How long should it be?)

<u>IS</u>		<u>SHOULD BE</u>
_____	0 years	_____
_____	3 years	_____
_____	6 years	_____
_____	9 years	_____
_____	12 years	_____
_____	15 years	_____
_____	18 years	_____
_____	21 years	_____
_____	24 years	_____
_____	27 years	_____
_____	30 years	_____
_____	33 years	_____
_____	36 years	_____
_____	39 years	_____
_____	40 years	_____

A. Who have you talked to in the past about this and other topics?

B. On the average, how often have you talked to these people about this and related topics?

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

2. What amount of money is spent each year on the upkeep of our national forests and parks by the federal government? (What amount should be spent?)

<u>IS</u>		<u>SHOULD BE</u>
_____	\$10 million	_____
_____	\$20 million	_____
_____	\$30 million	_____
_____	\$40 million	_____
_____	\$50 million	_____
_____	\$60 million	_____
_____	\$70 million	_____
_____	\$80 million	_____
_____	\$90 million	_____
_____	\$100 million	_____
_____	\$110 million	_____
_____	\$120 million	_____
_____	\$130 million or more	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month



3. How much life insurance does the average American family have for the "head of the family"? (How much should he have)

<u>IS</u>		<u>SHOULD HAVE</u>
_____	\$20,000	_____
_____	\$30,000	_____
_____	\$40,000	_____
_____	\$50,000	_____
_____	\$60,000	_____
_____	\$70,000	_____
_____	\$80,000	_____
_____	\$90,000	_____
_____	\$100,000	_____
_____	\$110,000	_____
_____	\$120,000	_____
_____	\$130,000	_____
_____	\$140,000	_____
_____	\$150,000	_____
_____	\$160,000	_____
_____	\$170,000	_____
_____	\$180,000	_____
_____	\$190,000	_____
_____	\$200,000 or more	_____

A. Who have you talked to in the past about this and related topics?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

B. On the average, how often have you talked to these people about this and related topics?

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

4. What do you think is the current size of the U.S. Armed Forces?  
(What size should it be?)

<u>IS</u>		<u>SHOULD BE</u>
_____	500,000 soldiers	_____
_____	1,000,000 soldiers	_____
_____	1,500,000 soldiers	_____
_____	2,000,000 soldiers	_____
_____	2,500,000 soldiers	_____
_____	3,000,000 soldiers	_____
_____	3,500,000 soldiers	_____
_____	4,000,000 soldiers	_____
_____	4,500,000 soldiers	_____
_____	5,000,000 soldiers	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

5. On the average weekday, how long does a 9-11 year old child watch television? (How long should a child watch?)

<u>IS</u>		<u>SHOULD</u>
_____	7 hours	_____
_____	6 1/2 hours	_____
_____	6 hours	_____
_____	5 1/2 hours	_____
_____	5 hours	_____
_____	4 1/2 hours	_____
_____	4 hours	_____
_____	3 1/2 hours	_____
_____	3 hours	_____
_____	2 1/2 hours	_____
_____	2 hours	_____
_____	1 1/2 hours	_____
_____	1 hour	_____
_____	1/2 hour	_____
_____	0 hour	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month

6. How much time per week do you think the average Michigan State University student gives to volunteer activities? (How long should a student give?)

<u>IS</u>		<u>SHOULD BE</u>
_____	0 hours	_____
_____	2 hours	_____
_____	4 hours	_____
_____	6 hours	_____
_____	8 hours	_____
_____	10 hours	_____
_____	12 hours	_____
_____	14 hours	_____
_____	16 hours	_____
_____	18 hours	_____
_____	20 hours	_____
_____	22 hours	_____
_____	24 hours	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

\_\_\_\_\_

0 1 2 3 4 5 6 7 8 9 10 11 12 13+  
hours/month

7. How much is spent by the federal government each year for cancer research? (How much should they spend?)

<u>IS</u>		<u>SHOULD BE</u>
_____	\$25 million	_____
_____	\$50 million	_____
_____	\$75 million	_____
_____	\$100 million	_____
_____	\$125 million	_____
_____	\$150 million	_____
_____	\$175 million	_____
_____	\$200 million	_____
_____	\$225 million	_____
_____	\$250 million	_____
_____	\$275 million	_____
_____	\$300 million or more	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month

8. What size weekly allowance do you think the average high school senior gets? (How much should a senior get?)

<u>IS</u>		<u>SHOULD GET</u>
_____	\$0.00	_____
_____	\$2.00	_____
_____	\$4.00	_____
_____	\$6.00	_____
_____	\$8.00	_____
_____	\$10.00	_____
_____	\$12.00	_____
_____	\$13.00	_____
_____	\$14.00	_____
_____	\$15.00	_____
_____	\$16.00	_____
_____	\$17.00	_____
_____	\$18.00	_____
_____	\$19.00	_____
_____	\$20.00	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month

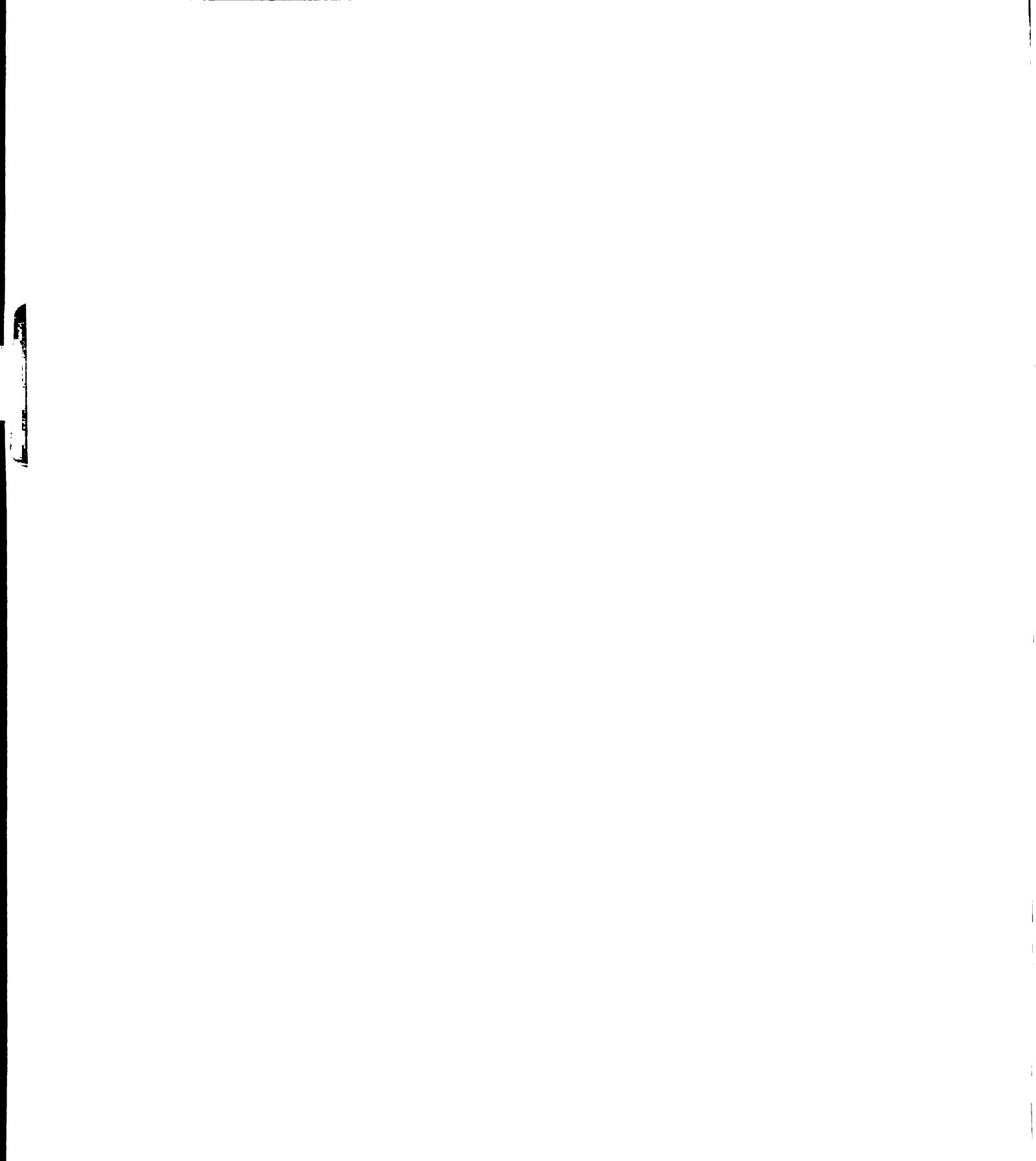
9. What do you think is the average size at Michigan State University?  
(What size should it be?)

<u>IS</u>		<u>SHOULD BE</u>
_____	15 students	_____
_____	30 students	_____
_____	45 students	_____
_____	60 students	_____
_____	75 students	_____
_____	90 students	_____
_____	100 students	_____
_____	120 students	_____
_____	140 students	_____
_____	150 students	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month





10. Each week on the networks, how many hours of children's television are there, not counting cartoons? (How many should there be?)

<u>IS</u>		<u>SHOULD BE</u>
_____	1 hour	_____
_____	2 hours	_____
_____	3 hours	_____
_____	4 hours	_____
_____	5 hours	_____
_____	6 hours	_____
_____	7 hours	_____
_____	8 hours	_____
_____	9 hours	_____
_____	10 hours	_____
_____	11 hours or more	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+
	hours/month

11. How much do you think the average family donates to charity each year?  
(How much should a family donate?)

<u>IS</u>		<u>SHOULD BE</u>
_____	\$50.00	_____
_____	\$100.00	_____
_____	\$150.00	_____
_____	\$200.00	_____
_____	\$250.00	_____
_____	\$300.00	_____
_____	\$350.00	_____
_____	\$400.00	_____
_____	\$450.00	_____
_____	\$500.00	_____
_____	\$550.00	_____
_____	\$600.00 or more	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month
_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13+	hours/month

12. How many hours a week should be given by local broadcasters to anti-drug public service announcements? (How many hours should be given?)

<u>IS</u>		<u>SHOULD BE</u>
_____	0 hours	_____
_____	1 hour	_____
_____	2 hours	_____
_____	3 hours	_____
_____	4 hours	_____
_____	5 hours	_____
_____	6 hours	_____
_____	7 hours	_____
_____	8 hours	_____
_____	9 hours	_____
_____	10 hours	_____
_____	11 hours	_____
_____	12 hours	_____

A. Who have you talked to in the past about this and related topics?

B. On the average, how often have you talked to these people about this and related topics?

_____	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
	hours/week													
_____	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
	hours/week													
_____	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
	hours/week													
_____	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
	hours/week													
_____	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
	hours/week													

While we are not interested in identifying you by name, we would like to identify certain sub-groups within the sample we are soliciting opinions from. For example, we would like to compare the opinions of students who are married to those who are single, separated, or divorced and so forth. Therefore, please provide the following demographic information.

1. I.D.# \_\_\_\_\_
2. Age \_\_\_\_\_
3. Sex -- Male - 1      Female - 2
4. Occupation--be specific \_\_\_\_\_
5. Religion--Protestant                      1
  - Roman Catholic                      2
  - Jewish                                      3
  - Eastern Orthodox                      4
  - Agnostic                                5
  - Atheist                                    6
  - Other                                      7
6. Marital Status--Single                      1
  - Married                                    2
  - Divorced or separated                      3
  - Widowed                                    4
7. What size community did you grow up in?
  - Farm or open country                      1
  - Village to 10,000 people                      2
  - Town 10,000 to 25,000 people                      3
  - Small city 25,000 to 100,000 people                      4
  - Large city over 100,000 people                      5
  - In a suburb of a large city                      6

8. What region of the country did you grow up in?
- |                            |   |
|----------------------------|---|
| East Coast and New England | 1 |
| South                      | 2 |
| Midwest                    | 3 |
| Southwest                  | 4 |
| Mountain                   | 5 |
| Pacific                    | 6 |
| Foreign                    | 7 |
9. How many years did you go to school? \_\_\_\_\_
10. What is your ethnic background? \_\_\_\_\_
11. What year in school are you at M.S.U.?
- |           |       |
|-----------|-------|
| Freshman  | _____ |
| Sophomore | _____ |
| Junior    | _____ |
| Senior    | _____ |
12. Are you a member of any volunteer organization?
- |     |       |
|-----|-------|
| Yes | _____ |
| No  | _____ |
13. If yes, what are they?
- |                                  |          |
|----------------------------------|----------|
| Veterans Organizations           | Yes -- 1 |
|                                  | No -- 0  |
| Clubs or Fraternal Organizations | Yes -- 1 |
|                                  | No -- 0  |
14. If you are a dependent, what is your father's occupation?
- 
15. What was your income in 1971? (from all sources) \_\_\_\_\_
16. Will your income in 1972 be: greater -- 2  
the same -- 1  
or less -- 0 than in 1971?

APPENDIX B

FIRST SET OF MESSAGES

Christian Science Monitor, January 20, 1973

"The average weekly allowance for high school seniors in medium and large cities in the United States ranged between \$4.00-\$6.00 in 1972, according to a study released recently by the Institute for Social Research at the University of Michigan. At the same time, the Guidance Counselors Association, which requested the study, recommended an increase in that allotment. They urged that parents allocate to their 17 and 18-year old high school seniors a sum of \$8~~X~~00 per week. They said that seniors should have additional financial responsibility because it would teach them about budgeting money for such things as lunches, gas and entertainment. They also suggested that the young adults would begin to realize how much or little that sum of money was depending on what they wanted to purchase. Further, the counseling group said that this introduction to financing would aid the young people in their handling of finances after graduation, whether they had to deal with paying for a college education or coping with a paycheck on their first job."

U.S. News & World Report, October 22, 1973

"In hearings before the Senate Commerce Committee, consumer advocate Ralph Nader called for governmental action to stem the effects of televised advertising of over-the-counter drugs. Citing recent evidence that such advertising is linked to the eventual use of "hard" drugs, Nader urged the government to ask for broadcast time to rebut the claims made in drug advertising. 'At present only 1 hour per week is dedicated to public service announcements warning of the harmful effects of legal and illegal drugs, while at least 4 hours per week are filled with drug advertisements.' Consequently Nader urged the government to require local broadcasters to donate 12 hours per week to public service announcements designed to warn consumers of the harmful effects of drug usage."



The following table shows the results of the experiment. The first column shows the number of trials, the second column shows the number of correct responses, and the third column shows the percentage of correct responses. The fourth column shows the standard error of the mean. The fifth column shows the t-value for the comparison between the two conditions. The sixth column shows the p-value for the comparison between the two conditions.

Trial	Correct	Percentage	SE	t	p
1	10	100	0	0	1
2	9	90	5	1.8	0.08
3	8	80	5	1.8	0.08
4	7	70	5	1.8	0.08
5	6	60	5	1.8	0.08
6	5	50	5	1.8	0.08
7	4	40	5	1.8	0.08
8	3	30	5	1.8	0.08
9	2	20	5	1.8	0.08
10	1	10	5	1.8	0.08
11	0	0	5	1.8	0.08
12	0	0	5	1.8	0.08
13	0	0	5	1.8	0.08
14	0	0	5	1.8	0.08
15	0	0	5	1.8	0.08
16	0	0	5	1.8	0.08
17	0	0	5	1.8	0.08
18	0	0	5	1.8	0.08
19	0	0	5	1.8	0.08
20	0	0	5	1.8	0.08

U.S. News & World Report

"The American Bar Association recommended last month that rape-convicted criminals be given longer prison sentences. Their survey of some 280 rape trials in the United States during 1972 indicated that the average conviction for rape resulted in a sentence which could be completed within 6 years. The ABA Committee on Equal Justice argued that this particular crime was apparently not being inhibited by the imposed sentences, and that rape was increasingly frequent as a reported offense. Further, arguing that this crime was a particularly sadistic violation of human rights, the ABA urged that the minimum sentence be one which precluded parole and encompassed 30 years. The ABA said such a sentence was warranted if the criminal was determined not to be suffering from severe psychiatric disorder."

THE UNIVERSITY OF CHICAGO

IN THE DEPARTMENT OF CHEMISTRY  
BY [Name]  
A DISSERTATION SUBMITTED TO THE FACULTY OF THE DIVISION OF THE PHYSICAL SCIENCES  
IN CANDIDACY FOR THE DEGREE OF DOCTOR OF PHILOSOPHY  
CHICAGO, ILLINOIS  
1956

Newsweek, March 25, 1973

"The Center for Research on Children's Television at Harvard University has issued a strongly-worded statement about the availability of television programming for children (aged 4-12) on commercial TV stations. The Center said that its analysis of what is not available indicates about 2 hours of programming per week day for that audience. The Center recommended that commercial networks develop and produce no less than 5 hours of programming each day for children. The basis for the Center's recommendation was that: (a) this age group watched from 3-6 hours per day on the average; (b) the children should have some alternatives to choose from rather than being force-fed a very restricted number of shows; (c) public television should not be expected to provide the major programming for this segment of the American public; (d) the programming now done does not do an acceptable job of giving different programs to the different age groups of children. With the recommended level of programming, the Center said that the child would have some options, and pro-social effects would be enhanced."

CONFIDENTIAL

1. The purpose of this document is to provide a comprehensive overview of the current state of the project and to identify the key challenges that must be addressed in order to ensure its successful completion. This document is intended for the use of senior management and is not to be distributed outside of the project team.

2. The project has made significant progress since its inception, with several key milestones having been achieved. However, there are a number of areas where the project is currently lagging behind schedule, and these areas require immediate attention. The primary challenges identified are:

- Resource constraints: The project is currently facing a shortage of key personnel, which is impacting the overall productivity and quality of the work.
- Communication gaps: There are significant communication gaps between the project team and the various stakeholders, which is leading to misunderstandings and delays.
- Budget overruns: The project is currently running over budget, which is a result of several factors, including increased costs for materials and labor.

3. In order to address these challenges and ensure the successful completion of the project, the following actions are recommended:

- Increase resource allocation: Additional resources should be allocated to the project, particularly in the areas of key personnel and technical support.
- Improve communication: Regular communication should be maintained between the project team and the various stakeholders, and any issues should be addressed promptly.
- Review the budget: The budget should be reviewed and adjusted as necessary, and any areas of overspending should be identified and addressed.

4. The project team is committed to working closely with senior management to address these challenges and ensure the successful completion of the project. It is requested that you provide your support and guidance in this regard.

Detroit News, January 27, 1973

"An ecology-minded group, The National Association for Conservation of Forests and Parks, today presented its proposal that federal support of forest and park conservation be extended to \$30,000,000 per year. The current federal funding level is \$20,000,000 per year. A spokesman for the organization, at a Washington news conference, said that this level of support was definitely required to maintain and preserve this ecological resource in the United States."

Detroit Free Press, February 18, 1973

"An independent consumer education organization reported that the average family of 5 should maintain a life insurance program for the head of the family valued at \$50,000. This contrasts with a current average of \$30,000 per family head. Such a sum, the organization claimed, could maintain a family at a satisfactory level for 3-4 years. This time period would give the family an opportunity to re-stabilize itself, without immediate physical and social hardship. This organization, which has no affiliation with any life insurance company, undertook a year long study of family needs, and their proposal was based on the results of that study."

Washington Post, February 15, 1973

"The Office of Child Development argues very strongly that the television diet of the typical 9-11 year old child should be limited to an average of 1 hour a day. In its yearly report based on scientific studies it has sponsored, the Office cited data which supported its proposal. That age group today averages slightly more than 6 hours of TV watching per day, counting weekends. Children who watch television for a greater amount of time than 1 hour have substantial difficulties in schoolwork, in playing with other children, and in differentiating real-life phenomena from make-believe."



New York Times, March 1, 1973

"Veterans to End the War took on a new mission during February, 1973 according to their national office. It was to urge a reduction in the peacetime size of the U.S. Armed Forces. Tom Robinson, national president of VEW, argued that the present strength of 3 million men and women was excessive in terms of peace-keeping objectives. After its own military and economic study of the armed services, VEW advocated a reduction in size to 2,000,000 personnel. This size, it was argued, was both draft-free and capable of providing the necessary services required both domestically and internationally."

U.S. News & World Report, March 19, 1973

"The National Cancer Institute requested the White House to authorize a budget to fight cancer of \$100,000,000, for the 1973-74 fiscal year. Its current annual budget is \$50,000,000. The institute director, Dr. Roger Forester, said that several major research efforts in the United States required additional funding to speed their search for cancer cures. Dr. Forester emphasized that this was not exploratory research, but research with an increasing promise of combatting several specific types of cancer which affects hundreds of thousands of Americans. Without the funds, work on these projects and others would slow down, and more people will die."

1941  
1942  
1943  
1944  
1945  
1946  
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Time Magazine, December 15, 1973

"The executive director of the United Fund today urged American families to increase their level of donations to an average of \$150 per family. Many fine programs, he said, which benefit thousands of Americans may go down the drain if the proposed support level is not reached. Today, the average American family contributes \$100 per year to all charities. Programs most in need of additional funding are those which will be cut off by the loss of federal support to the Office of Economic Opportunity, Model Cities and similar agencies. In particular these will be programs for pre-school children, fatherless families and public health services."

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State News, January 8, 1973

"The MSU Volunteers Office has made a strong call for more student help in its programs. The director of the office said that the requests the office receives for assistance far exceeds what it can do. And he said the difficulty was the lack of assistance from MSU undergraduates. One-half of the student body now participates an average of about 2 hours each a week. He urged that all students participate in the program, but at a minimum the program needed 2/3 of the student body to volunteer 14 hours a week. Without that level of support, he said the Office would have to turn down from one-half to two-thirds of the legitimate requests for assistance."



State News, February 15, 1973

"The average undergraduate class size at MSU is now 30 students, according to a report issued last week by the Provost's office. In order to keep student fees at their present level, the average class size will have to gradually become 100 in the next 5 years, the same report argued. Studies done in the last two years with varying class sizes have indicated that students learn as well, interact in class as much, and are generally as satisfied with this proposed class size. The report emphasized that such a size would be an average, and that many classes would be larger and many smaller than this."



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Christian Science Monitor, January 20, 1973

"The average weekly allowance for high school seniors in medium and large cities in the United States ranged between \$4.00-\$6.00 in 1971, according to a study released recently by the Institute for Social Research at the University of Michigan. At the same time, the Guidance Counselors Association which requested the study, recommended an increase in that allotment. They urged that parents allocate to their 17 and 18-year old high school seniors a sum of \$10.00 per week. They said that seniors should have additional financial responsibility because it would teach them about budgeting money for such things as lunches, gas and entertainment. They also suggested that the young adults would begin to realize how much or little that sum of money was depending on what they wanted to purchase. Further, the counseling group said that this introduction to financing would aid the young people in their handling of finances after graduation, whether they had to deal with paying for a college education or copying with a paycheck on their first job."

U.S. News & World Report, October 22, 1973

"In hearings before the Senate Commerce Committee, consumer advocate Ralph Nader called for governmental action to stem the effects of televised advertising of over-the-counter drugs. Citing recent evidence that such advertising is linked to the eventual use of "hard" drugs, Nader urged the government to ask for broadcast time to rebut the claims made in drug advertising. 'At present only 1 hour per week is dedicated to public service announcements warning of the harmful effects of legal and illegal drugs, while at least 4 hours per week are filled with drug advertisements.' Consequently, Nader urged the government to require local broadcasters to donate 4 hours per week to public service announcements designed to warn consumers of the harmful effects of drug usage."

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and change. It begins with the first people who lived on this continent, and continues through the years of exploration, settlement, and the struggle for independence. The story is one of a people who have built a great nation, and who are still building it today.

U.S. News & World Report, April 6, 1973

"The American Bar Association recommended last month that rape-convicted criminals be given longer prison sentences. Their survey of some 280 rape trials in the United States during 1972 indicated that the average conviction for rape resulted in a sentence which could be completed within 6 years. The ABA Committee of Equal Justice argued that this particular crime was apparently not being inhibited by the imposed sentences, and that rape was increasingly frequent as a reported offense. Further, arguing that this crime was a particularly sadistic violation of human rights, the ABA urged that the minimum sentence be one which precluded parole and encompassed 15 years. The ABA said such a sentence was warranted if the criminal was determined not to be suffering from severe psychiatric disorder."

Newsweek, March 25, 1973

"The Center for Research on Children's Television at Harvard University has issued a strongly-worded statement about the availability of television programming for children (aged 4-12) on commercial TV stations. The Center said that its analysis of what is now available indicates about 2 hours of programming per week day for that audience. The Center recommended that commercial networks develop and produce no less than 8 hours of programming each day for children. The basis for the Center's recommendation was that: (a) this age group watched from 3-6 hours per day on the average; (b) the children should have some alternatives to choose from rather than being force-fed a very restricted number of shows; (c) public television should not be expected to provide the major programming for this segment of the American public; (d) the programming now done does not do an acceptable job of giving different programs to the different age groups. With the recommended level of programming, the Center said that the child would have some options, and pro-social effects would be enhanced."

The first part of the report is devoted to a general survey of the situation in the country. It is followed by a detailed analysis of the economic situation, which shows a steady decline in the standard of living of the population. The author then discusses the political situation, which is characterized by a lack of democracy and a concentration of power in the hands of a few. Finally, the report concludes with a series of recommendations for the improvement of the country's situation.

The author's analysis is based on a wide range of sources, including official statistics, newspaper reports, and interviews with various groups of people. This gives the report a high degree of reliability and makes it a valuable contribution to the study of the country's problems.

The report is written in a clear and concise style, which makes it easy to read and understand. It is a well-organized and well-written work that provides a comprehensive overview of the country's situation.

The author's recommendations are practical and realistic, and they provide a clear path forward for the country. It is hoped that these recommendations will be taken into account by the government and that they will lead to a more democratic and prosperous future for the country.

Detroit News, January 27, 1973

"An ecology-minded group, The National Association for Conservation of Forests and Parks, today presented its proposal that federal support of forest and park conservation be extended to \$50,000,000 per year. The current federal funding level is \$20,000,000 per year. A spokesman for the organization, at a Washington news conference, said that this level of support was definitely required to maintain and preserve this ecological resource in the United States."



Administrative Report

The following information is provided for your review. It is intended to provide a comprehensive overview of the current status of the project. The data is based on the most recent reports and is subject to change as more information becomes available. The primary objective of this report is to ensure that all stakeholders are kept informed of the progress and any potential risks. The information is organized into several key areas, including project milestones, resource allocation, and budgetary concerns. It is important to note that while the overall project is on track, there are some areas where additional attention is required to ensure timely completion. The report concludes with a summary of the key findings and recommendations for the next steps.

Detroit Free Press, February 18, 1973

"An independent consumer education organization reported that the average family of 5 should maintain a life insurance program for the head of the family valued at \$150,000. This contrasts with a current average of \$30,000 per family head. Such a sum, the organization claimed, could maintain a family at a satisfactory level for 3-4 years. This time period would give the family an opportunity to re-stabilize itself, without immediate physical and social hardship. This organization, which has no affiliation with any life insurance company, undertook a year long study of family needs, and their proposal was based on the results of that study."



Washington Post, February 15, 1973

"The Office of Child Development argues very strongly that the television diet of the typical 9-11 year old child should be limited to an average of 5 hours a day. In its yearly report based on scientific studies it has sponsored, the Office cited data which supported its proposal. That age group today averages slightly more than 6 hours of TV watching per day, counting weekends. Children who watch television for a greater amount of time than 5 hours have substantial difficulties in schoolwork, in playing with other children, and in differentiating real-life phenomena from make-believe."

and report with the appropriate authorities. The information provided in this report is for your information only and is not to be disseminated outside your organization. The information is classified as CONFIDENTIAL - SECURITY INFORMATION. If you have any questions, please contact the appropriate authorities.

New York Times, March 1, 1973

"Veterans to End the War took on a new mission during February, 1973 according to their national office. It was to urge a reduction in the peacetime size of the U.S. Armed Forces. Tom Robinson, national president of VEW, argued that the present strength of 3 million men and women was excessive in terms of peace-keeping objectives. After its own military and economic study of the armed services, VEW advocated a reduction in size of 1,000,000 personnel. This size, it was argued, was both draft-free and capable of providing the necessary services required both domestically and internationally."

1948

1. The first part of the report deals with the general situation in the country. It is noted that the economy is still in a state of depression and that the government has not been able to carry out its program of reconstruction. The report also mentions the political situation and the role of the military.

2. The second part of the report discusses the economic situation. It is noted that the government has not been able to carry out its program of reconstruction and that the economy is still in a state of depression. The report also mentions the role of the military and the political situation.

3. The third part of the report discusses the political situation. It is noted that the government has not been able to carry out its program of reconstruction and that the economy is still in a state of depression. The report also mentions the role of the military and the political situation.

4. The fourth part of the report discusses the role of the military. It is noted that the government has not been able to carry out its program of reconstruction and that the economy is still in a state of depression. The report also mentions the political situation and the role of the military.

U.S. News & World Report, March 19, 1973

"The National Cancer Institute requested the White House to authorize a budget to fight cancer of \$75,000,000, for the 1973-74 fiscal year. Its current annual budget is \$50,000,000. The institute director, Dr. Roger Forester, said that several major research efforts in the United States required additional funding to speed their search for cancer cures. Dr. Forester emphasized that this was not exploratory research but research with an increasing promise of combatting several specific types of cancer which affects hundreds of thousands of Americans. Without the funds, work on these projects and others would slow down, and more people will die."



State News, January 8, 1973

"The MSU Volunteers Office has made a strong call for more student help in its programs. The director of the office said that the requests the office receives for assistance far exceeds what it can do. And he said the difficulty was the lack of assistance from MSU undergraduates. One-half of the student body now participates an average of about 2 hours each a week. He urged that all students participate in the program, but at a minimum the program needed 2/3 of the student body to volunteer 8 hours a week. Without that level of support, he said the Office would have to turn down from one-half to two-thirds of the legitimate requests for assistance."

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State News, February 15, 1973

"The average undergraduate class size at MSU is now 30 students, according to a report issued last week by the Provost's office. In order to keep student fees at their present level, the average class size will have to gradually become 45 in the next 5 years, the same report argued. Studies done in the last two years with varying class sizes have indicated that students learn as well, interact in class as much, and are generally as satisfied with this proposed class size. The report emphasized that such a size would be an average, and that many classes would be larger and many smaller than this."



Time Magazine, December 15, 1972

"The executive director of the United Fund today urged American families to increase their level of donations to an average of \$200 per family. Many fine programs, he said, which benefit thousands of Americans may go down the drain if the proposed support level is not reached. Today, the average American family contributes \$100 per year to all charities. Programs most in need of additional funding are those which will be cut off by the loss of federal support to the Office of Economic Opportunity, Model Cities and similar agencies. In particular these will be programs for pre-school children, fatherless families and public health services."

Article of Association

Article 1. The name of the corporation shall be the State of New York.  
Article 2. The purpose of the corporation shall be to maintain and improve the  
public health of the State of New York.  
Article 3. The corporation shall have the power to do all things necessary and proper  
to carry out its purposes.  
Article 4. The corporation shall have the power to contract, sue and be sued  
in its own name.  
Article 5. The corporation shall have the power to hold, convey, lease, mortgage  
and otherwise dispose of real and personal property.  
Article 6. The corporation shall have the power to make, alter, amend and repeal  
its bylaws.  
Article 7. The corporation shall have the power to elect and remove its officers  
and directors.  
Article 8. The corporation shall have the power to make, alter, amend and repeal  
its articles of association.

Christian Science Monitor, January 20, 1973

"The average weekly allowance for high school seniors in medium and large cities in the United States ranged between \$4.00-\$6.00 in 1971, according to a study released recently by the Institute for Social Research at the University of Michigan. At the same time, the Guidance Counselors Association which requested the study, recommended an increase in that allotment. They urged that parents allocate to their 17 and 18-year old high school seniors a sum of \$15.00 per week. They said that seniors should have additional financial responsibility because it would teach them about budgeting money for such things as lunches, gas and entertainment. They also suggested that the young adults would begin to realize how much or little that sum of money was depending on what they wanted to purchase. Further, the counseling group said that this introduction to financing would aid the young people in their handling of finances after graduation, whether they had to deal with paying for a college education or coping with a paycheck on their first job."





U.S. News & World Report, October 22, 1973

"In hearings before the Senate Commerce Committee, consumer advocate Ralph Nader called for governmental action to stem the effects of televised advertising of over-the-counter drugs. Citing recent evidence that such advertising is linked to the eventual use of "hard" drugs, Nader urged the government to ask to broadcast time to rebut the claims made in drug advertising. 'At present only 1 hour per week is dedicated to public service announcements warning of the harmful effects of legal and illegal drugs, while at least 4 hours per week are filled with drug advertisements.' Consequently, Nader urged the government to require local broadcasters to donate 8 hours per week to public service announcements designed to warn consumers of the harmful effects of drug usage."

The first part of the report deals with the general situation of the country and the progress of the work during the year. It is followed by a detailed account of the various projects and the results achieved. The report concludes with a summary of the work done and a list of the publications issued during the year.

U.S. News & World Report, April 6, 1973

"The American Bar Association recommended last month that rape-convicted criminals be given longer prison sentences. Their survey of some 280 rape trials in the United States during 1972 indicated that the average conviction for rape resulted in a sentence which could be completed within 6 years. The ABA Committee on Equal Justice argued that this particular crime was apparently not being inhibited by the imposed sentences, and that rape was increasingly frequent as a reported offense. Further, arguing that this crime was a particularly sadistic violation of human rights the ABA urged that the minimum sentence be one which precluded parole and encompassed 9 years. The ABA said such a sentence was warranted if the criminal was determined not to be suffering from severe psychiatric disorder."

THE UNIVERSITY OF MICHIGAN

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ANN ARBOR, MICHIGAN 48106-1000  
TEL: (313) 763-7000  
FAX: (313) 763-7000  
WWW: WWW.LIBRARY.UMICH.EDU

Newsweek, March 25, 1973

"The Center for Research on Children's Television at Harvard University has issued a strongly-worded statement about the availability of television programming for children (aged 4-12) on commercial TV stations. The Center said that its analysis of what is now available indicates about 2 hours of programming per week day for that audience. The Center recommended that commercial networks develop and produce no less than 3 hours of programming each day for children. The basis for the Center's recommendation was that: (a) this age group watched from 3-6 hours per day on the average; (b) the children should have some alternatives to choose from rather than being force-fed a very restricted number of shows; (c) public television should not be expected to provide the major programming for this segment of the American public; (d) the programming now done does not do an acceptable job of giving different programs to the different age groups of children. With the recommended level of programming, the Center said that the child would have some options, and pro-social effects would be enhanced."



Detroit News, January 27, 1973

"An ecology-minded group, The National Association for Conservation of Forests and Parks, today presented its proposal that federal support of forest and park conservation be extended to \$100,000,000 per year. The current federal funding level is \$20,000,000 per year. A spokesman for the organization, at a Washington news conference, said that this level of support was definitely required to maintain and preserve this ecological resource in the United States."

1957 - 1958

The following is a list of the names of the persons who were members of the Board of Directors of the Corporation during the year 1957-1958. The names are listed in alphabetical order of the last name.



Detroit Free Press, February 18, 1973

"An independent consumer education organization reported that the average family of 5 should maintain a life insurance program for the head of the family valued at \$80,000. This contrasts with a current average of \$30,000 per family head. Such a sum, the organization claimed, could maintain a family at a satisfactory level for 3-4 years. This time period would give the family an opportunity to re-stabilize itself, without immediate physical and social hardship. This organization, which has no affiliation with any life insurance company, undertook a year long study of family needs, and their proposal was based on the results of that study."

THE UNIVERSITY OF CHICAGO

Department of Mathematics  
Chicago, Illinois

Dear Sirs:

I am pleased to hear that you are interested in the work of the University of Chicago. I am sure that you will find the work of our department to be of the highest quality and interest. I am sure that you will find the work of our department to be of the highest quality and interest.

Very truly yours,  
[Signature]

Washington Post, February 15, 1973

"The Office of Child Development argues very strongly that the television diet of the typical 9-11 year old child should be limited to an average of 2.5 hours a day. In its yearly report based on scientific studies it has sponsored, the Office cited data which supported its proposal. That age group today averages slightly more than 6 hours of TV watching per day, counting weekends. Children who watch television for a greater amount of time than 2.5 hours have substantial difficulties in schoolwork, in playing with other children, and in differentiating real-life phenomena from make-believe."



New York Times, March 1, 1973

"Veterans to End the War took on a new mission during February, 1973 according to their national office. It was to urge a reduction in the peacetime size of the U.S. Armed Forces. Tom Robinson, national president of VEW, argued that the present strength of 3 million men and women was excessive in terms of peace-keeping objectives. After its own military and economic study of the armed services, VEW advocated a reduction in size to 1,500,000 personnel. This size, it was argued, was both draft-free and capable of providing the necessary services required both domestically and internationally."

U.S. News & World Report, March 19, 1973

"The National Cancer Institute requested the White House to authorize a budget to fight cancer of \$200,000,000, for the 1973-74 fiscal year. Its current annual budget is \$50,000,000. The institute director, Dr. Roger Forester, said that several major research efforts in the United States required additional funding to speed their search for cancer cures. Dr. Forester emphasized that this was not exploratory research, but research with an increasing promise of combatting several specific types of cancer which affects hundreds of thousands of Americans. Without the funds, work on these projects and others would slow down, and more people will die."



Time Magazine, December 15, 1972

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State News, January 8, 1973

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1944

1. The first part of the report deals with the general situation in the country. It is noted that the economy is in a state of depression and that the government is facing a serious financial crisis. The report also mentions that the population is suffering from widespread poverty and unemployment.

2. The second part of the report discusses the political situation. It is noted that the government is weak and that there is a lack of unity among the political parties. The report also mentions that the military is in a state of disarray and that there is a risk of a coup d'état.

3. The third part of the report deals with the social situation. It is noted that there is a high level of illiteracy and that the health care system is in a state of collapse. The report also mentions that there is a widespread sense of hopelessness and despair among the population.

4. The fourth part of the report discusses the international situation. It is noted that the country is isolated and that there is a lack of support from the major powers. The report also mentions that the country is facing a serious threat from the Axis powers.

5. The fifth part of the report deals with the future of the country. It is noted that the country needs a strong and stable government and that there is a need for economic and social reforms. The report also mentions that the population needs to be united and that there is a need for a sense of purpose and direction.

State News, February 15, 1973

"The average undergraduate class size at MSU is now 30 students, according to a report issued last week by the Provost's office. In order to keep student fees at their present level, the average class size will have to gradually become 60 in the next 5 years, the same report argued. Studies done in the last two years with varying class sizes have indicated that students learn as well, interact in class as much, and are generally as satisfied with this proposed class size. The report emphasized that such a size would be an average, and that many classes would be larger and many smaller than this."

1911

Received of the Treasurer of the  
Board of Education the sum of  
\$100.00 for the year ending  
June 30, 1911. This amount  
is for the purchase of books  
for the library of the  
Board of Education.

APPENDIX C

SECOND SET OF MESSAGES

State Journal, March 1, 1973

One issue discussed by the MSU Board of Trustees at its last meeting was the effect of the "money squeeze" on the University. The Board examined projections of future student enrollment which showed a huge increase over the next five years. Several Board members stated concern over the likelihood that the federal and state governments may continue to cut aid to higher education. The Board considered a number of proposed alternatives to counter any future financial problems. One alternative was to increase the class size from 30 students to 45 students over the course of the next five years. Several MSU administrators said that such an increase would relieve some of the financial pressure on the university while still keeping learning at a high rate. "There are techniques which enable a professor to successfully deal with a class of this size. If anything, the level of learning may increase," according to one spokesman.

Newsweek, March 1, 1973

Several organizations have joined together in appealing to the American people to be generous in their donations to charity this year. The president of the United Fund said that without money from private donations many worthwhile programs will end because of the lack of federal and state money. He echoed the call made by several mayors last week that present funding will be inappropriate to stem the urban decay that threatens our cities. "We strongly urge Americans to donate an average of \$200 per family this year to all charities. Such a figure would allow us to support several programs designed to aid the elderly and the very young." This figure is in contrast to the \$100 donated by the average American family last year to charity.



The first part of the report deals with the general situation in the country. It is noted that the economy is still in a state of depression and that the government has to take measures to improve the situation. The second part of the report deals with the situation in the different regions of the country. It is noted that the situation is very different in the different regions and that the government has to take measures to improve the situation in the different regions.

New York Times, March 1, 1973

Dr. Benjamin Harris, representing the American Medical Association, announced that the AMA would urge action in Congress to increase the funding for research into cancer prevention from the present level of \$50,000,000 to \$75,000,000 for the 1973-74 fiscal year. Citing recent cutbacks in medical research money by the federal government, Dr. Harris warned that present efforts to find cures for the dreaded disease would stop if the proposed amount is not appropriated. "We must not abandon existing programs which are showing real progress toward finding a cure for cancer. We must not abandon those patients whose hopes depend on the successful completion of these projects."

1950

1. The first part of the report deals with the general situation of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

2. The second part of the report deals with the financial position of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

3. The third part of the report deals with the social and economic conditions of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

4. The fourth part of the report deals with the educational and cultural conditions of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

5. The fifth part of the report deals with the health and medical conditions of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

6. The sixth part of the report deals with the legal and judicial conditions of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

7. The seventh part of the report deals with the administrative and public relations conditions of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

8. The eighth part of the report deals with the foreign relations and international affairs of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

9. The ninth part of the report deals with the military and defense conditions of the country and the progress of the work during the year. It is followed by a detailed account of the work done in each of the various departments.

10. The tenth part of the report deals with the general conclusions and recommendations of the committee for the year.

State Journal, March 1, 1973

One issue discussed by the MSU Board of Trustees at its last meeting was the effect of the "money squeeze" on the University. The Board examined projections of future student enrollment which showed a huge increase over the next five years. Several Board members stated concern over the likelihood that the federal and state governments may continue to cut aid to higher education. The Board considered a number of proposed alternatives to counter any future financial problems. One alternative was to increase the class size from 30 students to 60 students over the course of the next five years. Several MSU administrators said that such an increase would relieve some of the financial pressure on the university while still keeping learning at a high rate. "There are techniques which enable a professor to successfully deal with a class of this size. If anything, the level of learning may increase," according to one spokesman.

Newsweek, March 1, 1973

Several organizations have joined together in appealing to the American people to be generous in their donations to charity this year. The president of the United Fund said that without money from private donations many worthwhile programs will end because of the lack of federal and state money. He echoed the call made by several mayors last week that present funding will be inappropriate to stem the urban decay that threatens our cities. "We strongly urge Americans to donate an average of \$400 per family this year to all charities. Such a figure would allow us to support several programs designed to aid the elderly and the very young." This figure is in contrast to the \$100 donated by the average American family last year to charity.



New York Times, March 1, 1973

Dr. Benjamin Harris, representing the American Medical Association, announced that the AMA would urge action in Congress to increase the funding for research into cancer prevention from the present level of \$50,000,000 to \$200,000,000 for the 1973-74 fiscal year. Citing recent cutbacks in medical research money by the federal government, Dr. Harris warned that present efforts to find cures for the dreaded disease would stop if the proposed amount is not appropriated. "We must not abandon existing programs which are showing real progress toward finding a cure for cancer. We must not abandon those patients whose hopes depend on the successful completion of these projects."

Dear Sirs,  
I have the pleasure to inform you that your application for the position of [Job Title] has been reviewed and we are pleased to offer you the position. The offer is for a full-time position, starting on [Start Date]. The salary for this position is [Salary] per annum, plus a benefits package which includes [Benefits].  
We are confident that you will find this an excellent opportunity to develop your skills and contribute to our organization. Please accept our congratulations and we look forward to your acceptance of this offer.  
Yours faithfully,  
[Name]  
[Title]



State Journal, March 1, 1973

One issue discussed by the MSU Board of Trustees at its last meeting was the effect of the "money squeeze" on the University. The Board examined projections of future student enrollment which showed a huge increase over the next five years. Several Board members stated concern over the likelihood that the federal and state governments may continue to cut aid to higher education. The Board considered a number of proposed alternatives to counter any future financial problems. One alternative was to increase the class size from 30 students to 100 students over the course of the next five years. Several MSU administrators said that such an increase would relieve some of the financial pressure on the university while still keeping learning at a high rate. "There are techniques which enable a professor to successfully deal with a class of this size. If anything, the level of learning may increase," according to one spokesman.

The first part of the report is devoted to a description of the work done during the year. It is divided into two main sections: a general account of the work done and a detailed account of the work done on the various projects. The general account is divided into three parts: a description of the work done on the various projects, a description of the work done on the various projects, and a description of the work done on the various projects. The detailed account is divided into two parts: a description of the work done on the various projects, and a description of the work done on the various projects.

Newsweek, March 1, 1973

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APPENDIX D

THIRD SET OF MESSAGES

State News, April 5, 1973

MSU officials conferred last week with several state legislators about financial aid to the university in the next few years. One university official said that he was very worried about the lack of money coming to the university from the State. "It looks like we will have to look for ways to save money. One way of saving money would be to increase the average class size. At present the average class size is 30. We could reasonably increase that number to 45 over the next five years and still maintain high educational standards. We could save money and the students could still receive an excellent education."





Time Magazine, April 9, 1973

Debate began this week in Congress over grants to medical research. A bill is being considered which would increase the level of funding for all research in the area of cancer and other related diseases. The bill asks for \$75,000,000 for the 1973-74 fiscal year. A spokesman for the American Medical Association told a Senate Subcommittee that the present level of \$50,000,000 is insufficient to cover the inflationary costs of medical research. "The inflation which is plaguing the country is especially bad in medical areas." He explained that the cost of keeping present programs going is much larger than the amount of money given by Congress last year. He concluded, "Its simply a question of whether the American people are willing to spend the money to find a cure for the dreaded disease."

The following information was obtained from the records of the  
Department of the Interior, Bureau of Land Management, and the  
Bureau of Reclamation, regarding the land parcels described  
in the attached schedule. The information is being provided for  
your information and is not intended to constitute a warranty  
of any kind. The information is based on the records of the  
Department of the Interior, Bureau of Land Management, and the  
Bureau of Reclamation, and is subject to change without notice.  
The information is provided for your information and is not  
intended to constitute a warranty of any kind. The information  
is based on the records of the Department of the Interior,  
Bureau of Land Management, and the Bureau of Reclamation, and  
is subject to change without notice.

Wall Street Journal, April 9, 1973

A spokesman for the Department of Health, Education and Welfare announced yesterday that the cost of living increased faster last year than the year before. The director of cost accounting at HEW said that families receiving government support suffered most by this increase. "Government assistance to the unemployed, handicapped, elderly and dependent children could not keep up with the cost of living. Also, we have received word that increases in aid to these groups will not be coming." When asked how these people will be able to live, he said, "We urge Americans to donate money to charities. Last year the average family gave \$100 to charities. We support the United Fund's goal of receiving \$200 per family this year. If that figure can be reached, then many needy people will be able to buy those things necessary for living."

1947

1. The first part of the report deals with the general situation of the country and the progress of the work during the year. It is followed by a detailed account of the various projects and the results achieved.

2. The second part of the report deals with the financial aspects of the work. It gives a summary of the income and expenditure for the year and a statement of the balance sheet.

3. The third part of the report deals with the personnel of the organization. It gives a list of the staff and their duties and a summary of their work during the year.

4. The fourth part of the report deals with the future plans of the organization. It gives a summary of the work to be done in the next year and the resources required for it.

5. The fifth part of the report deals with the conclusions of the work. It gives a summary of the main findings of the work and the recommendations made.

State News, April 5, 1973

MSU officials conferred last week with several state legislators about financial aid to the university in the next few years. One university official said that he was very worried about the lack of money coming to the university from the State. "It looks like we will have to look for ways to save money. One way of saving money would be to increase the average class size. At present the average class size is 30. We could reasonably increase that number to 60 over the next five years and still maintain high educational standards. We could save money and the students could still receive an excellent education."

The first part of the report deals with the general situation in the country. It is noted that the economy is still in a state of depression, and that the government is facing a serious financial crisis. The report then discusses the various measures that have been taken to deal with the situation, and the results of these measures. It is concluded that the situation is still very serious, and that further action is needed.

Wall Street Journal, April 9, 1973

A spokesman for the Department of Health, Education and Welfare announced yesterday that the cost of living increased faster last year than the year before. The director of cost accounting at HEW said that families receiving government support suffered most by this increase. "Government assistance to the unemployed, handicapped, elderly and dependent children could not keep up with the cost of living. Also, we have received word that increases in aid to these groups will not be coming." When asked how these people will be able to live, he said, "We urge Americans to donate money to charities. Last year the average family gave \$100 to charities. We support the United Fund's goal of receiving \$400 per family this year. If that figure can be reached, then many needy people will be able to buy those things necessary for living."

The first part of the report deals with the general situation in the country. It is noted that the economy is still in a state of depression, and that the government has taken various measures to stimulate it. The second part of the report deals with the financial situation, and the third part deals with the social situation. The report concludes with a number of recommendations for the government.



Time Magazine, April 9, 1973

Debate began this week in Congress over grants to medical research. A bill is being considered which would increase the level of funding for all research in the area of cancer and other related diseases. The bill asks for \$200,000,000 for the 1973-74 fiscal year. A spokesman for the American Medical Association told a Senate Subcommittee that the present level of \$50,000,000 is insufficient to cover the inflationary costs of medical research. "The inflation which is plaguing the country is especially bad in medical areas." He explained that the cost of keeping present programs going is much larger than the amount of money given by Congress last year. He concluded, "Its simply a question of whether the American people are willing to spend the money to find a cure for the dreaded disease."

The first part of the report deals with the general situation in the country. It is noted that the economy is still in a state of depression, and that the government is facing a serious financial crisis. The report then discusses the various measures that have been taken by the government to deal with the situation, and the results of these measures. It is concluded that the government has made some progress, but that more needs to be done to bring the economy back to a state of stability.

State News, April 5, 1973

MSU officials conferred last week with several state legislators about financial aid to the university in the next few years. One university official said that he was very worried about the lack of money coming to the university from the State. "It looks like we will have to look for ways to save money. One way of saving money would be to increase the average class size. At present the average class size is 30. We could reasonably increase that number to 100 over the next five years and still maintain high educational standards. We could save money and the students could still receive an excellent education."

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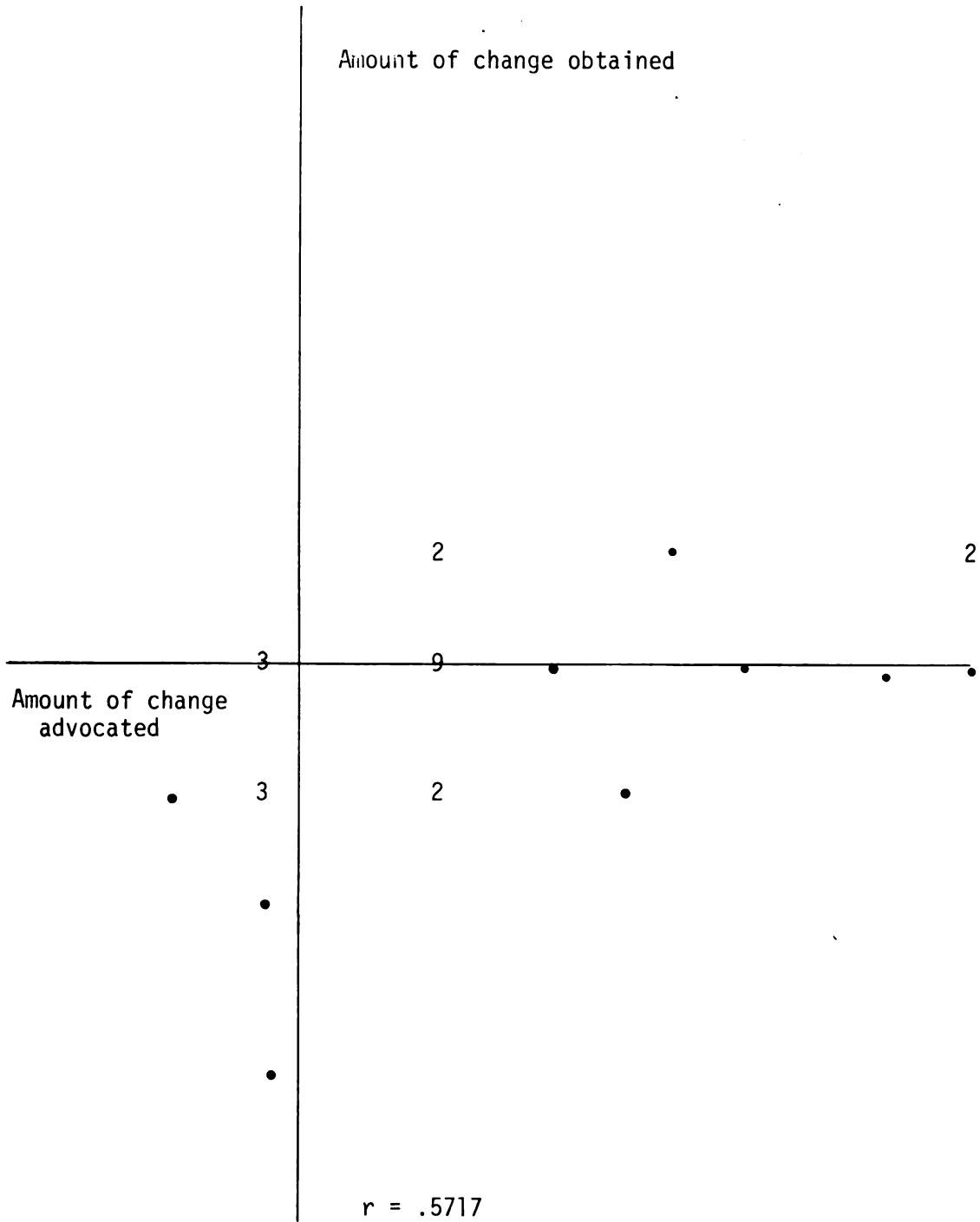


Time Magazine, April 9, 1973

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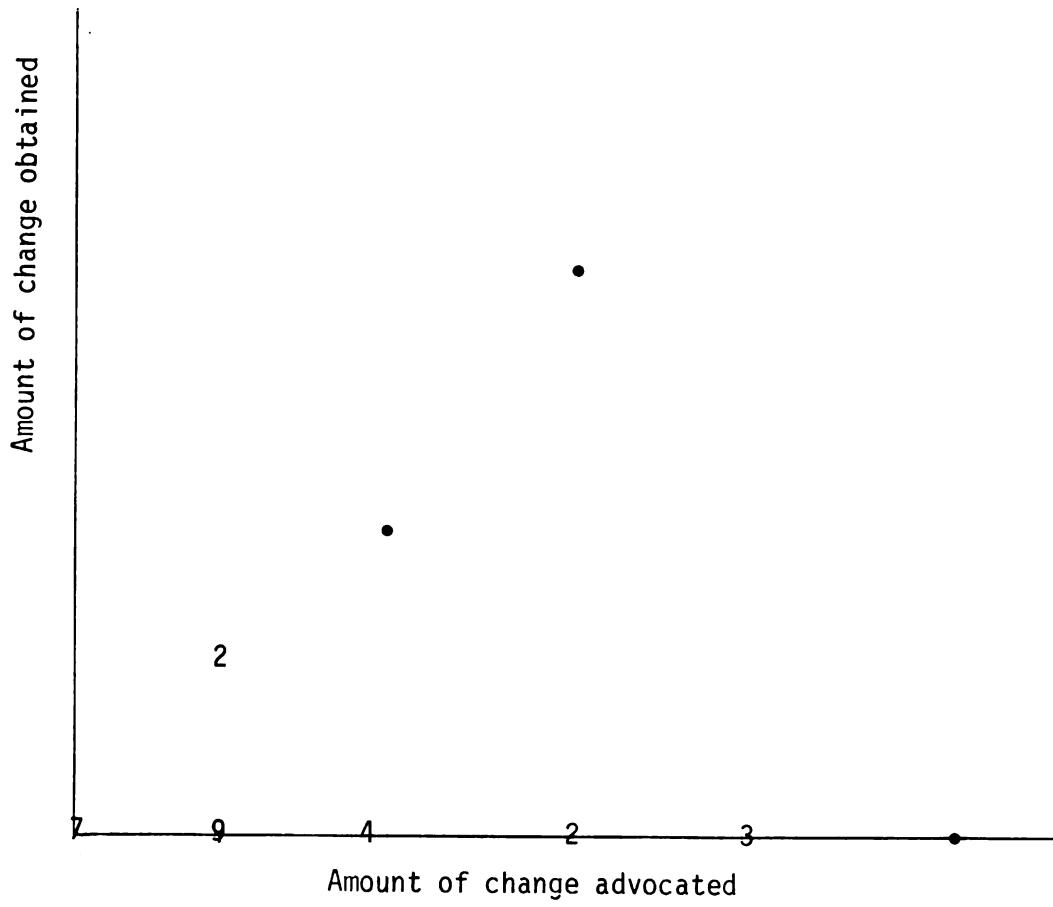
APPENDIX E

VELOCITY SCATTERPLOTS

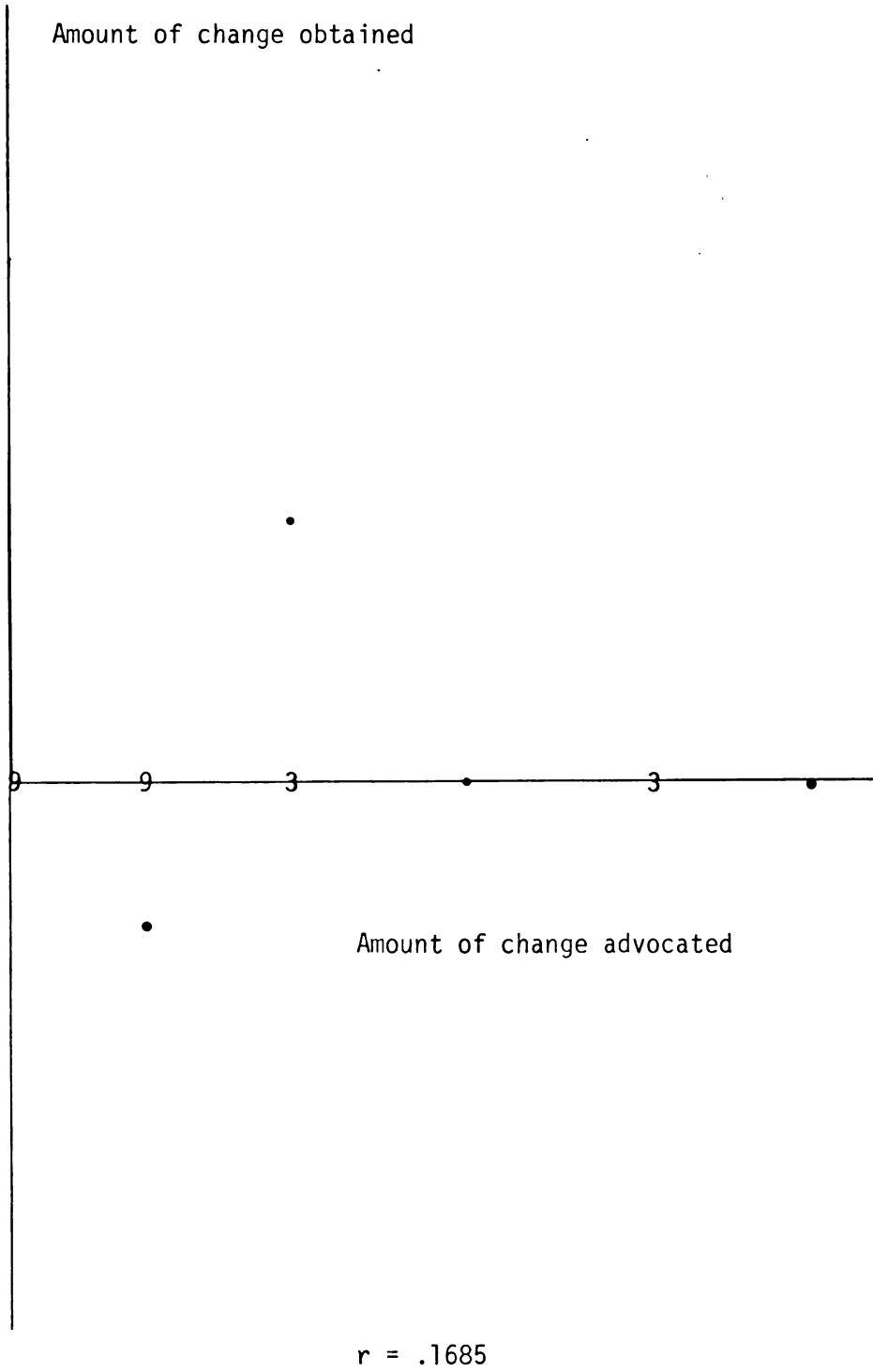


Graph E-1.--Class Size-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_2 - \bar{A}_1$ .

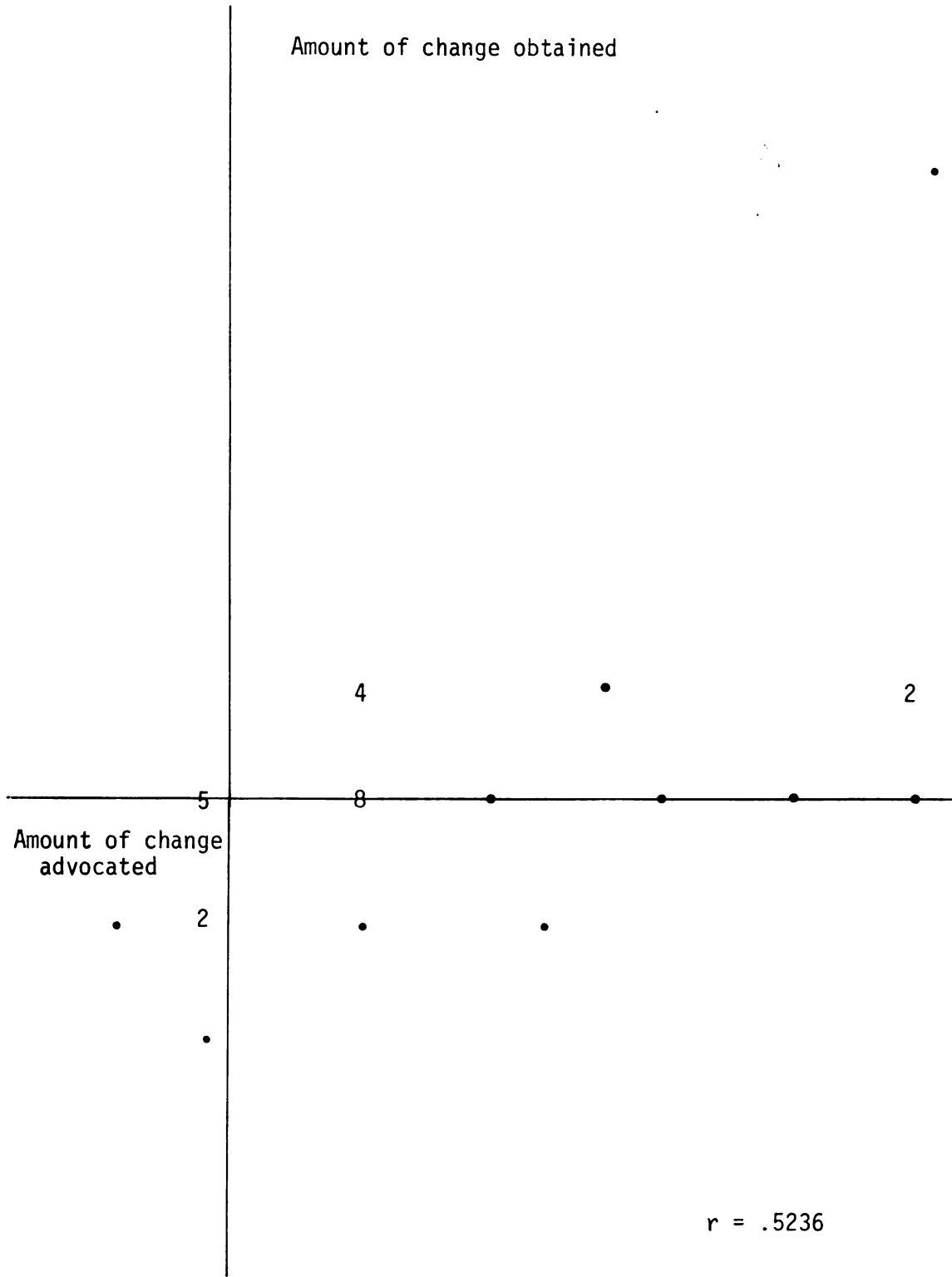




Graph E-2.--Class Size-- $\bar{M}_2 - \bar{A}_2$  with  $\bar{A}_3 - \bar{A}_2$ .

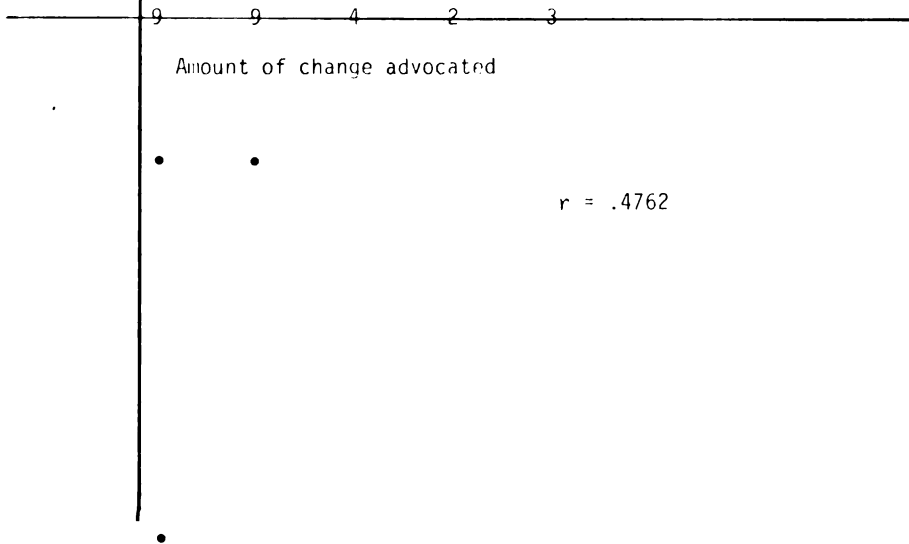


Graph E-3.--Class Size-- $\bar{M}_3 - \bar{A}_3$  with  $\bar{A}_4 - \bar{A}_3$ .

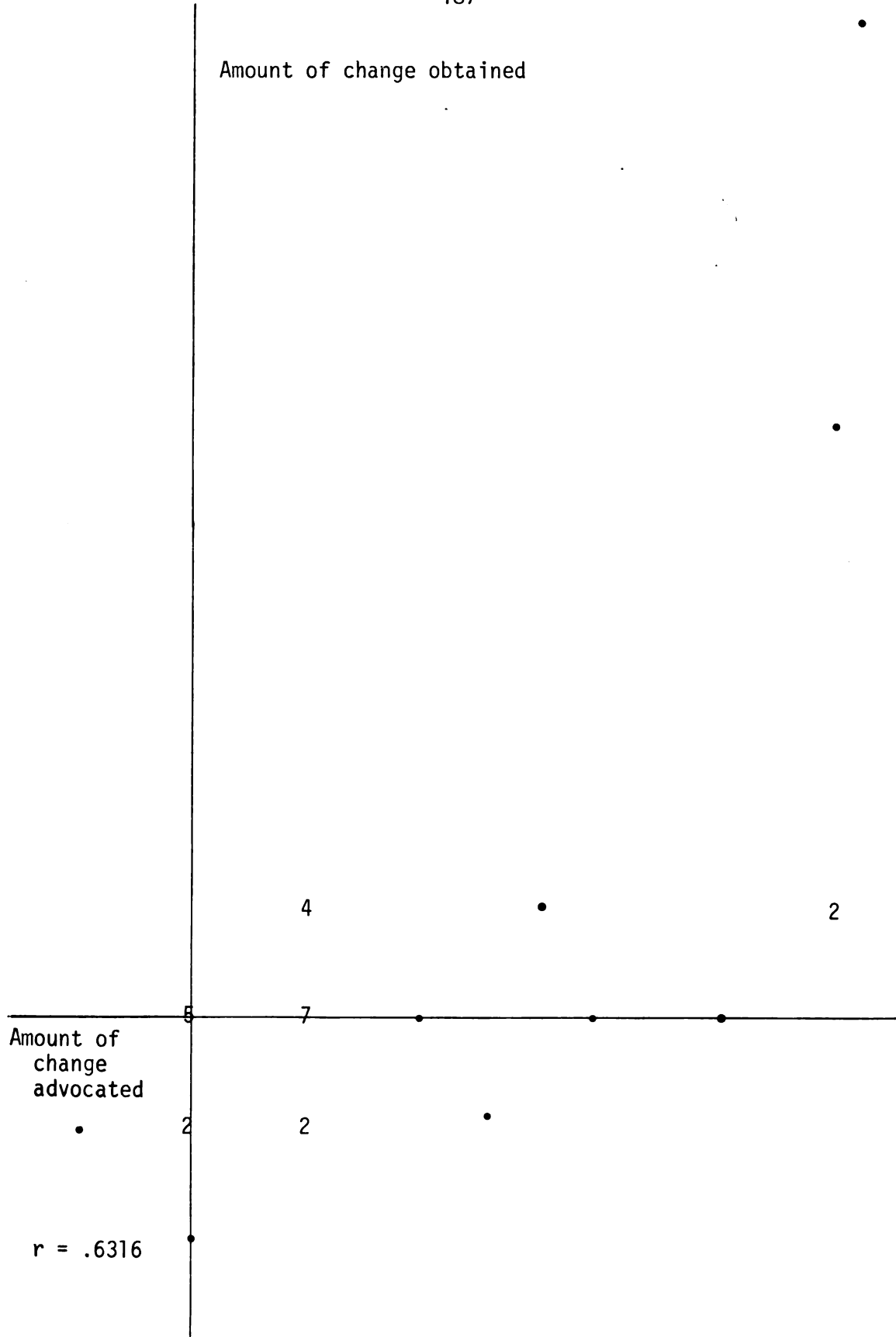


Graph E-4.--Class Size-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_3 - \bar{A}_1$ .

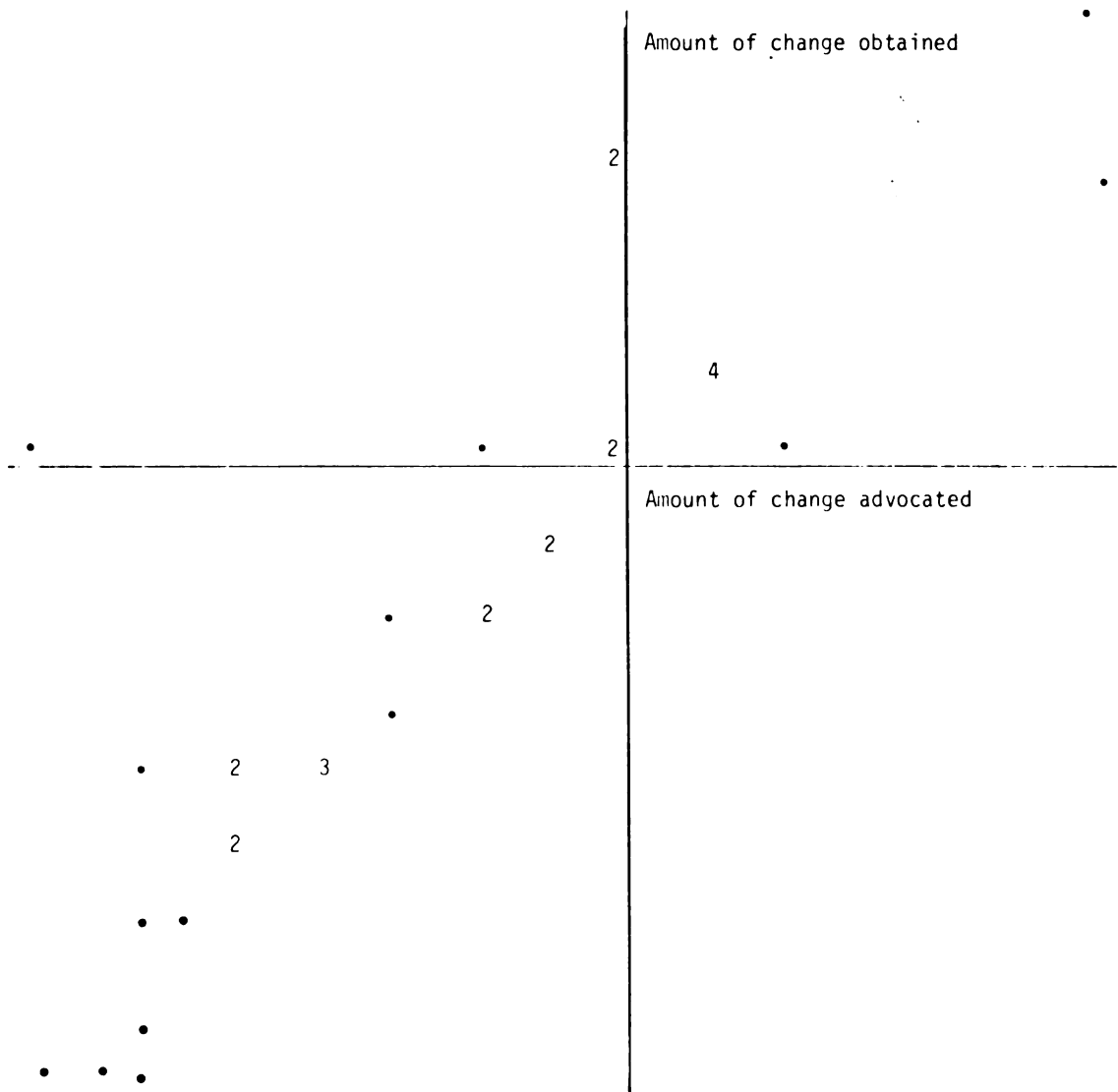
Amount of change obtained



Graph E-5.--Class Size-- $\bar{M}_3 - \bar{A}_3$  with  $\bar{A}_5 - \bar{A}_3$ .

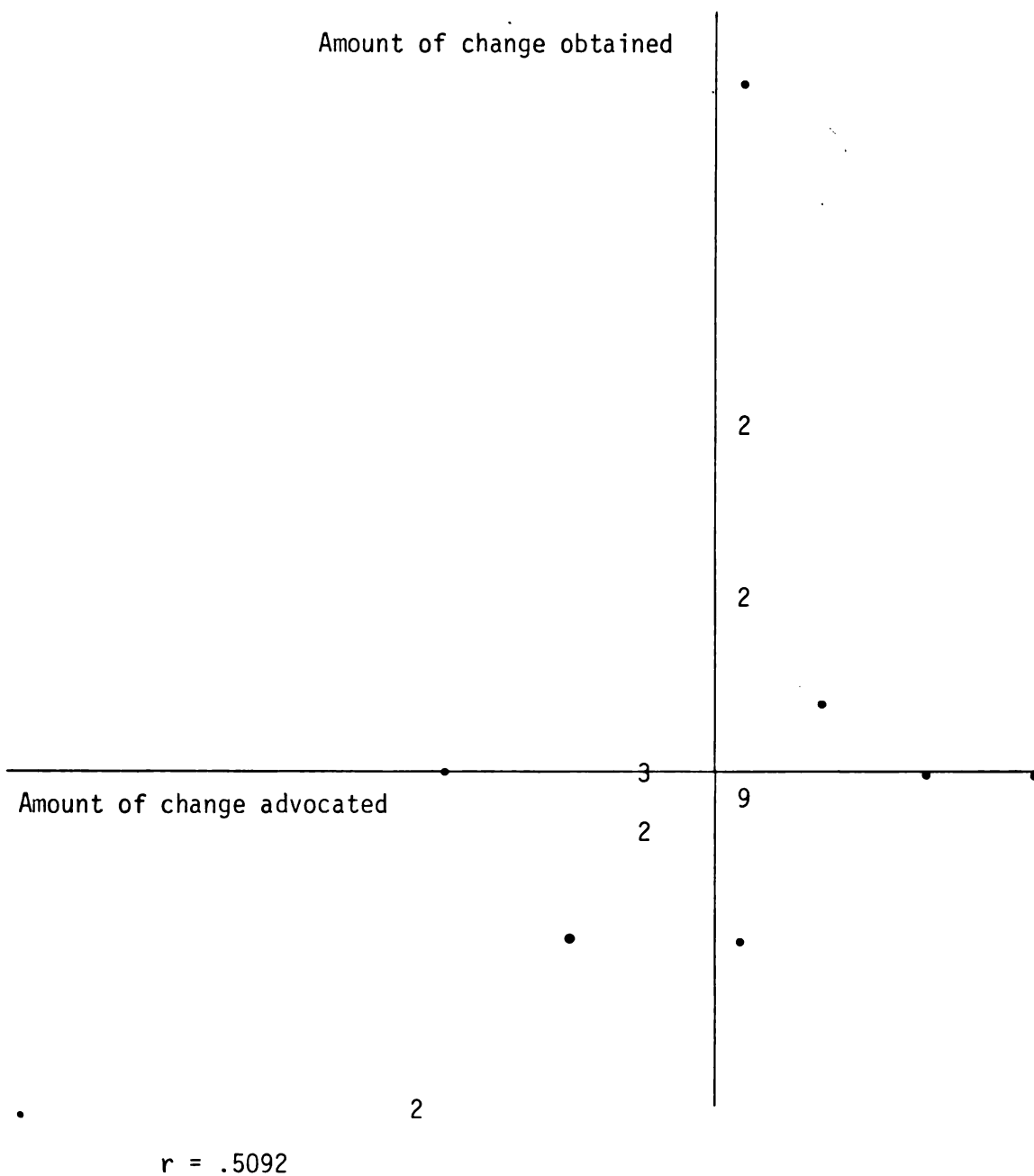


Graph E-6.--Class Size-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_5 - \bar{A}_1$ .

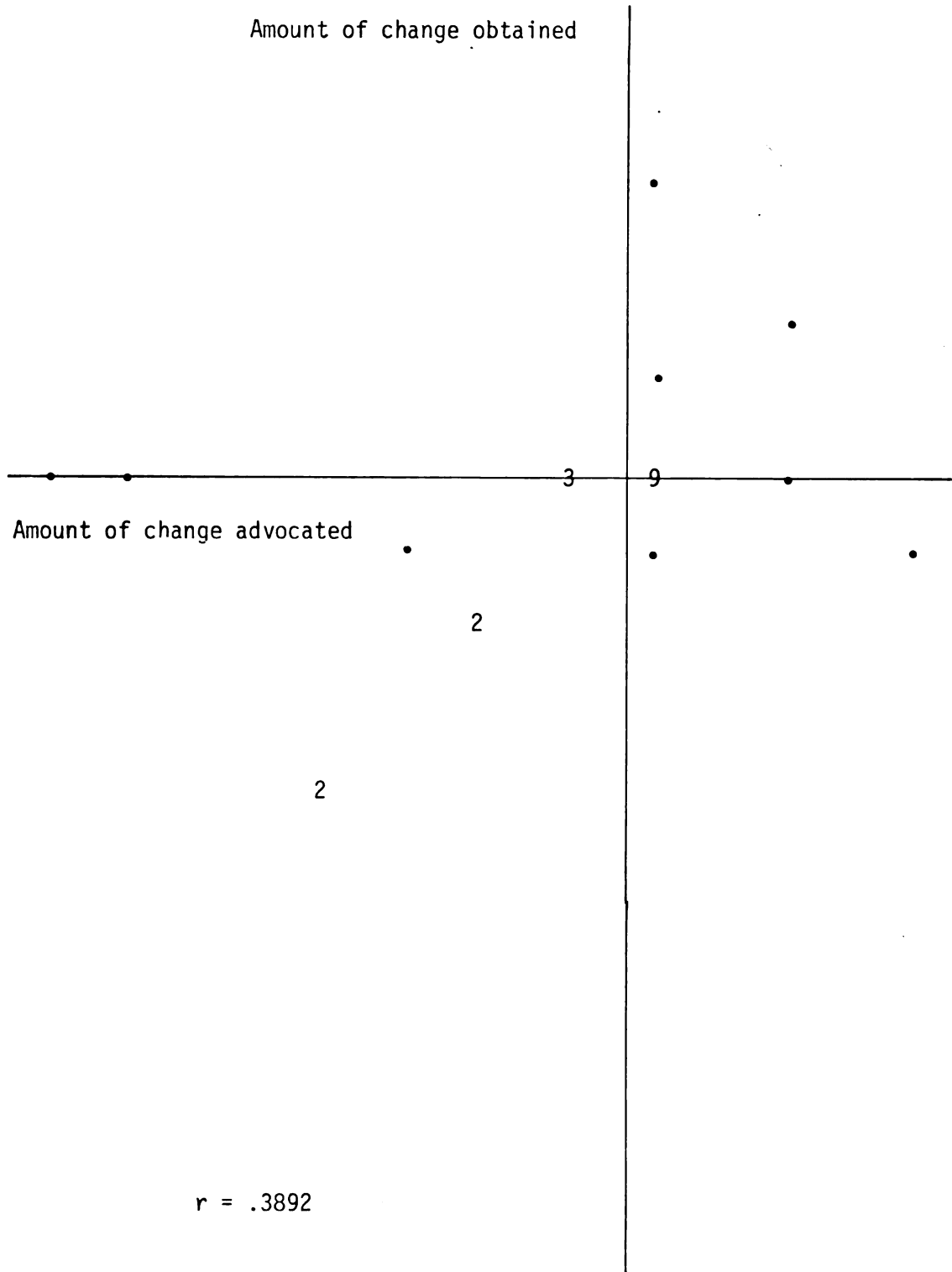


$r = .85213$

Graph E-7.--Cancer Funds-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_2 - \bar{A}_1$ .

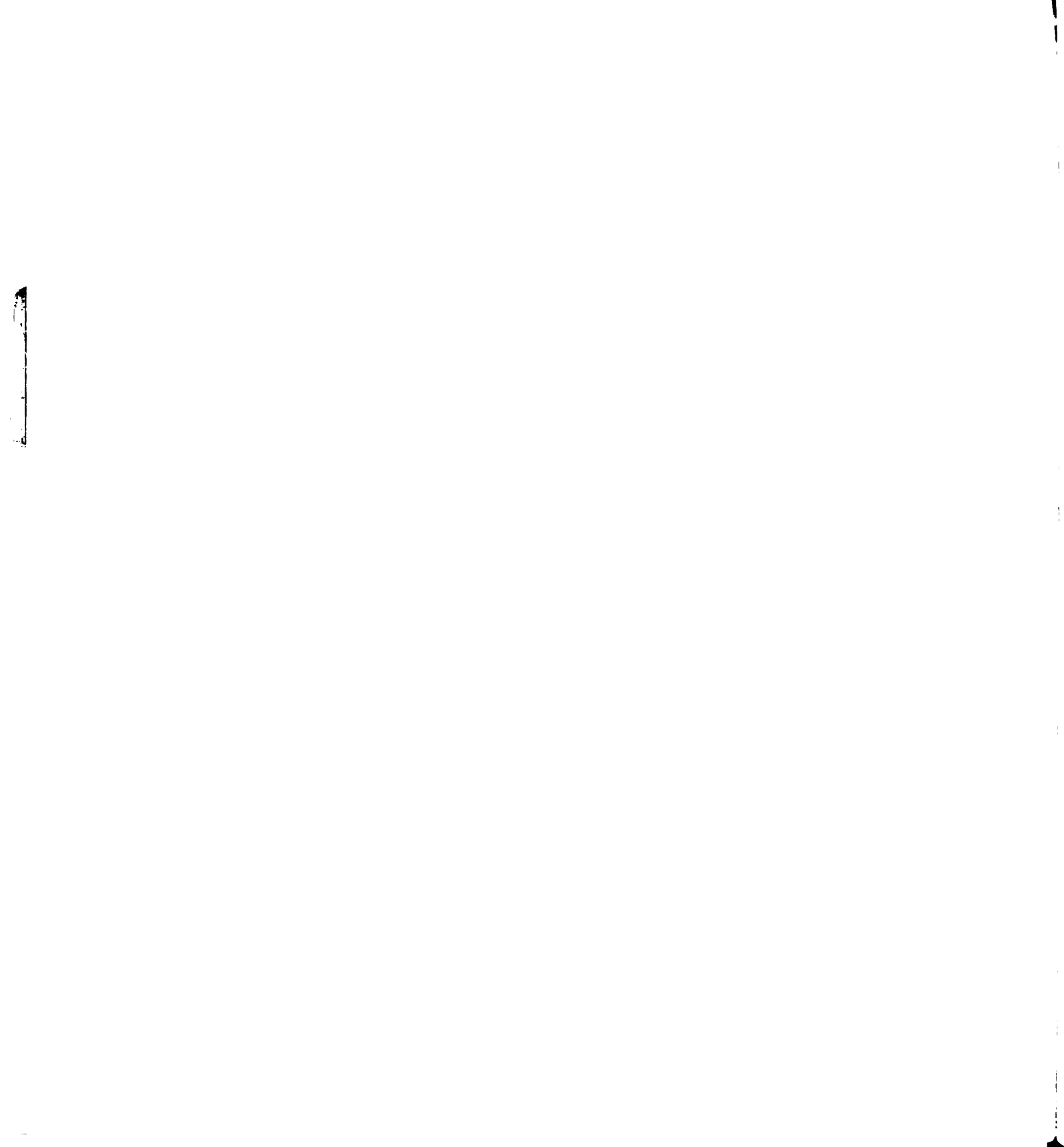


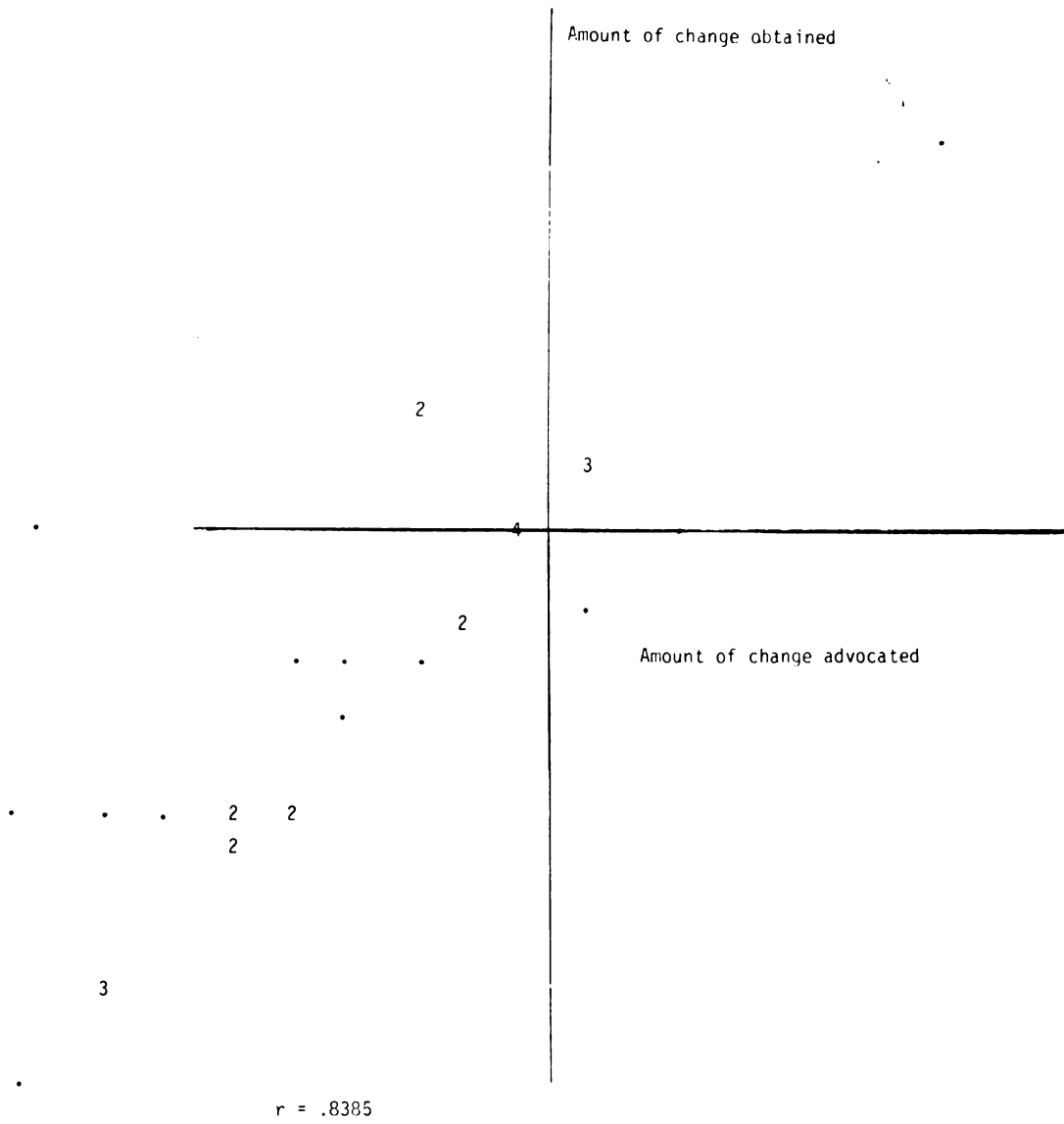
Graph E-8.--Cancer Funds-- $\bar{M}_2 - \bar{A}_2$  with  $\bar{A}_3 - \bar{A}_2$ .



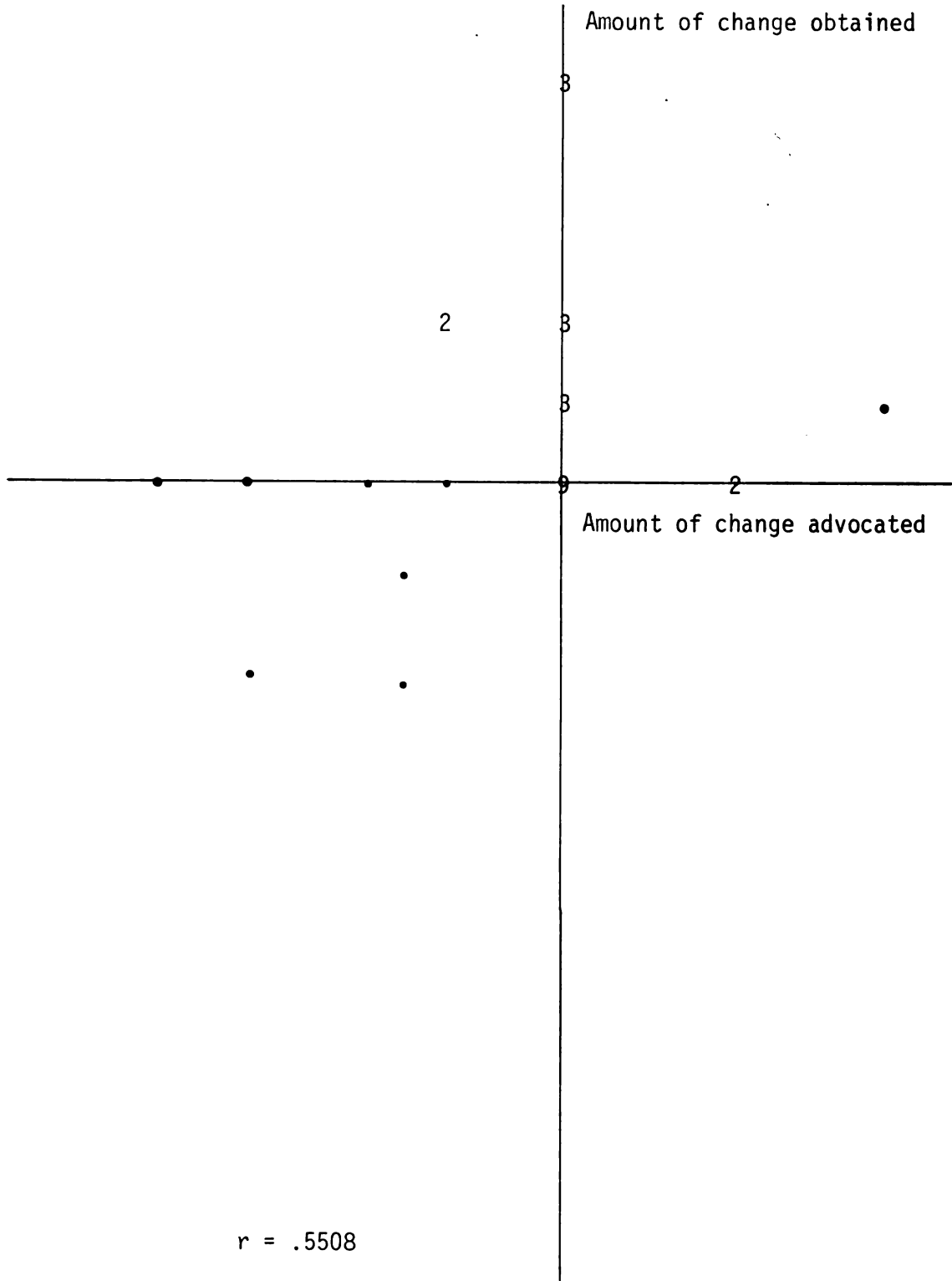
Graph E-9.--Cancer Funds-- $\bar{M}_3 - \bar{A}_3$  with  $\bar{A}_4 - \bar{A}_3$ .



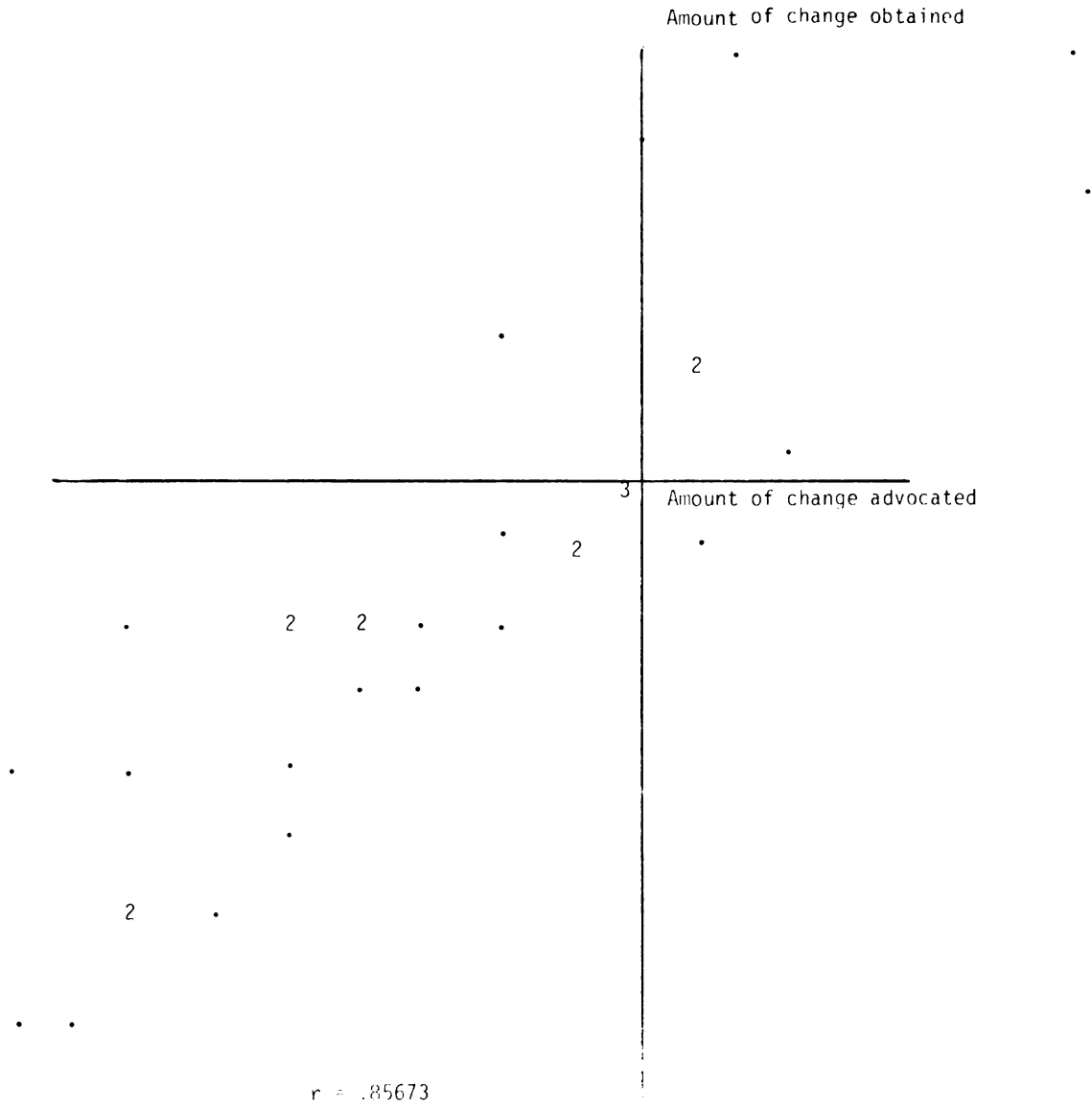




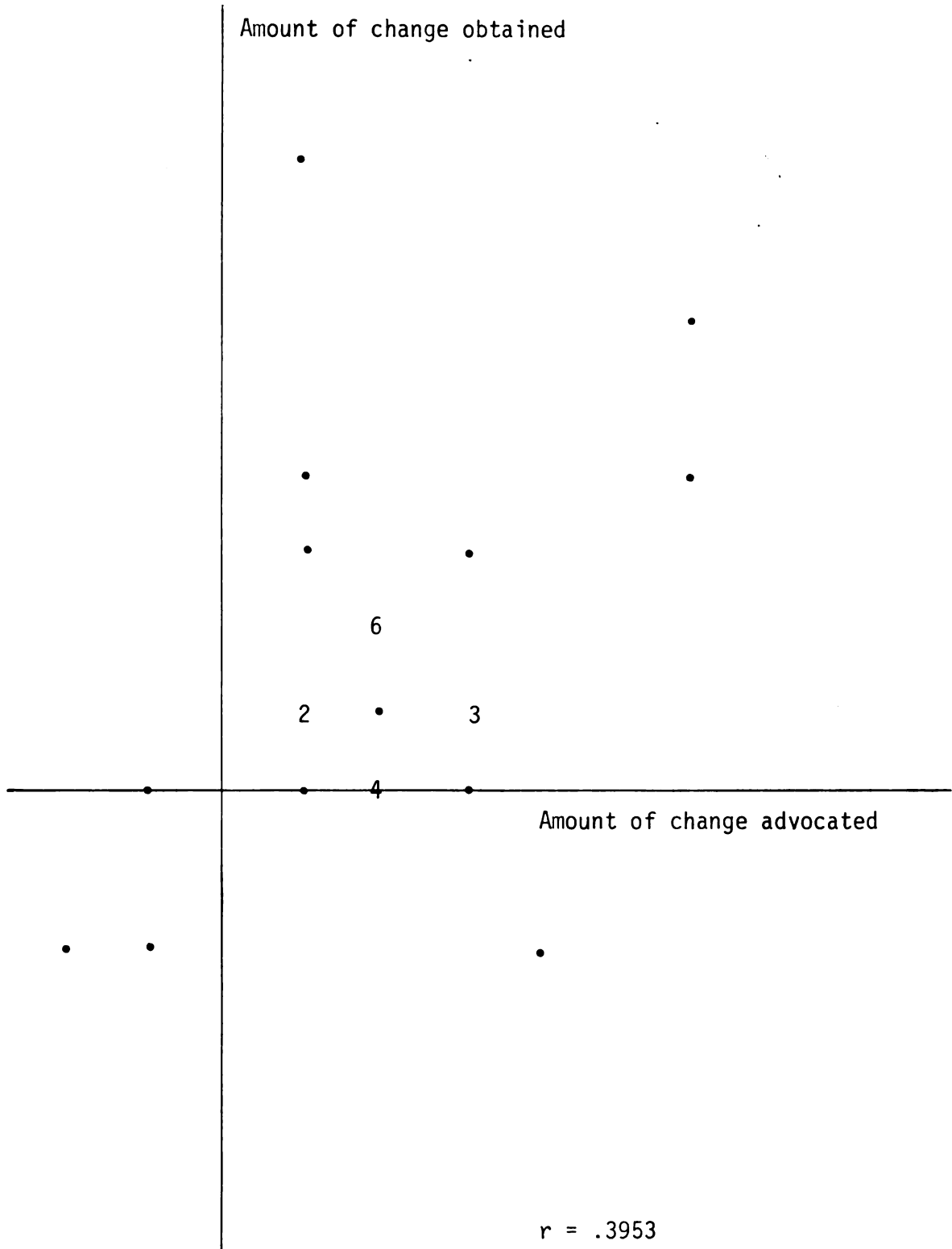
Graph E-10.--Cancer Funds-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_3 - \bar{A}_1$ .



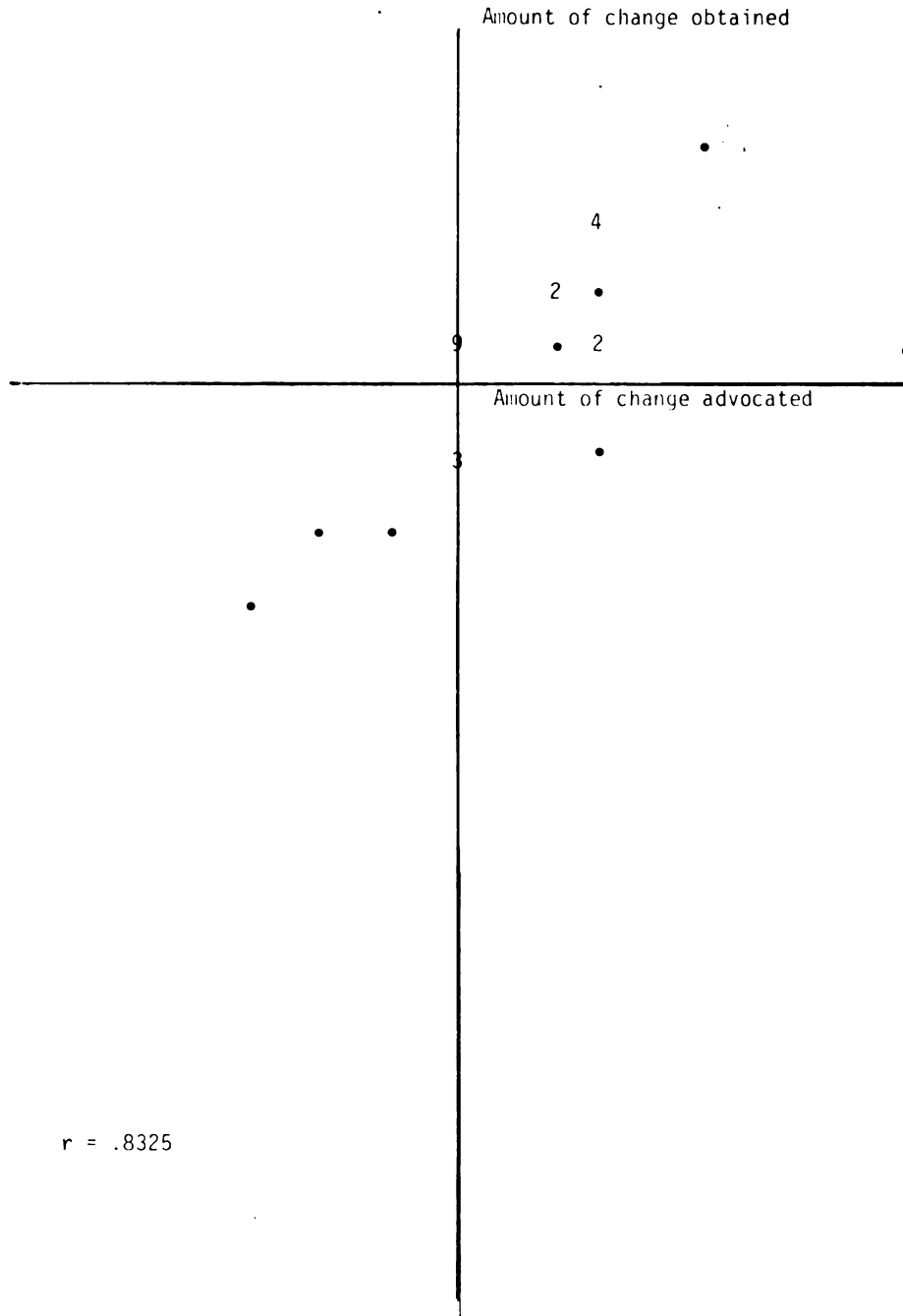
Graph E-11.--Cancer Funds-- $\bar{M}_3 - \bar{A}_3$  with  $\bar{A}_5 - \bar{A}_3$ .



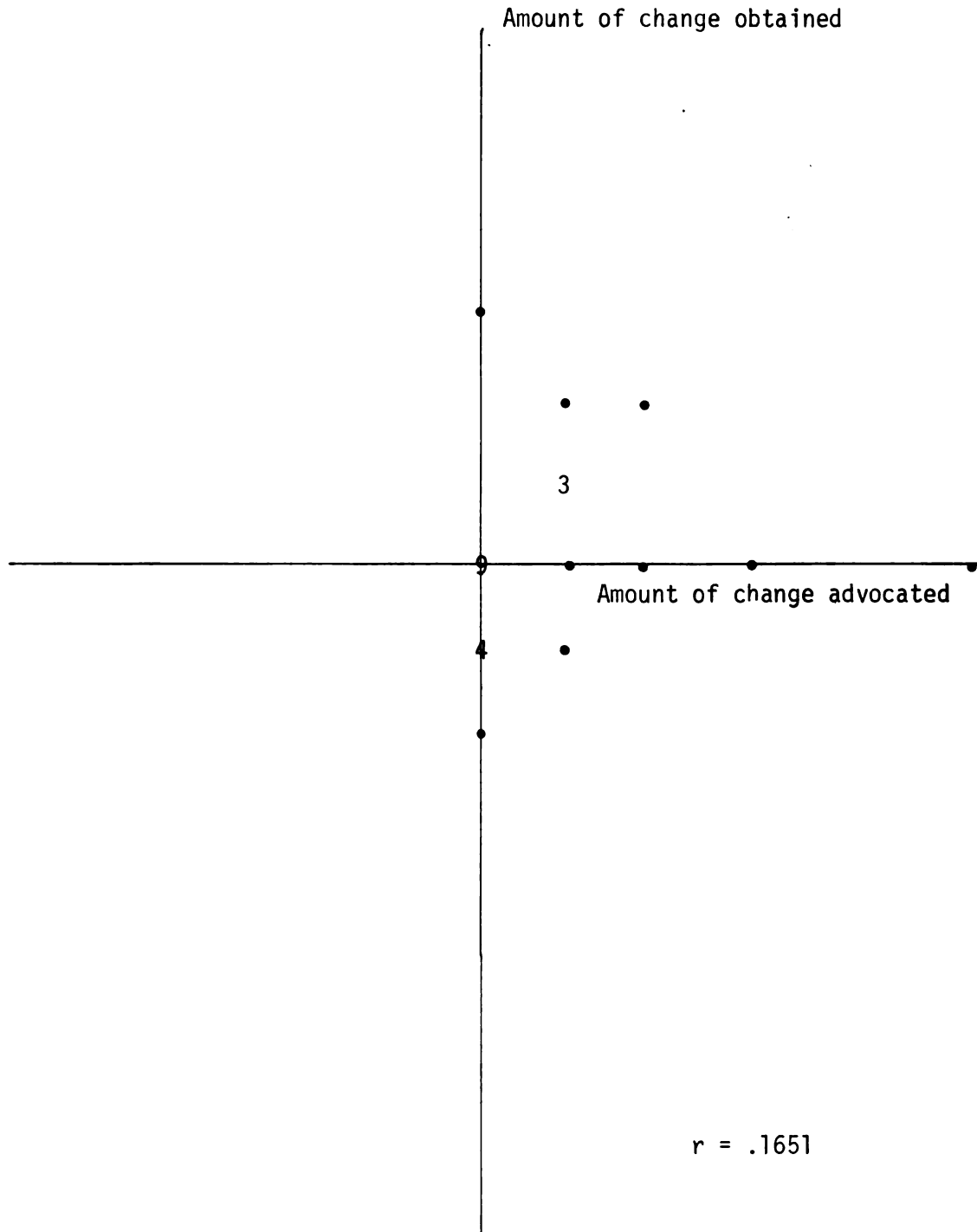
Graph E-12.--Cancer Funds-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_5 - \bar{A}_1$ .



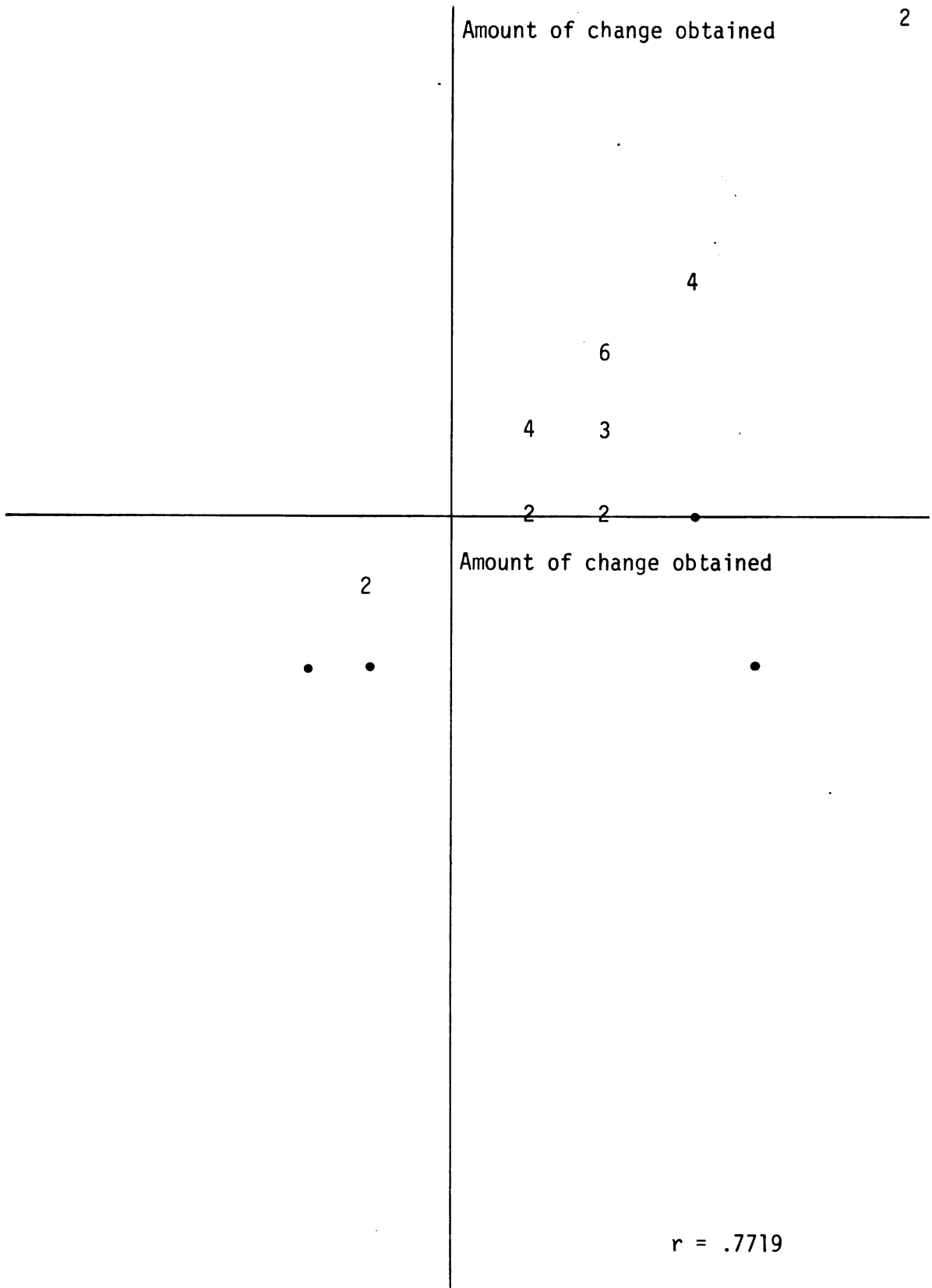
Graph E-13.--Charity Donations-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_2 - \bar{A}_1$ .



Graph E-14.--Charity Donations-- $\bar{M}_2 - \bar{A}_2$  with  $\bar{A}_3 - \bar{A}_2$ .

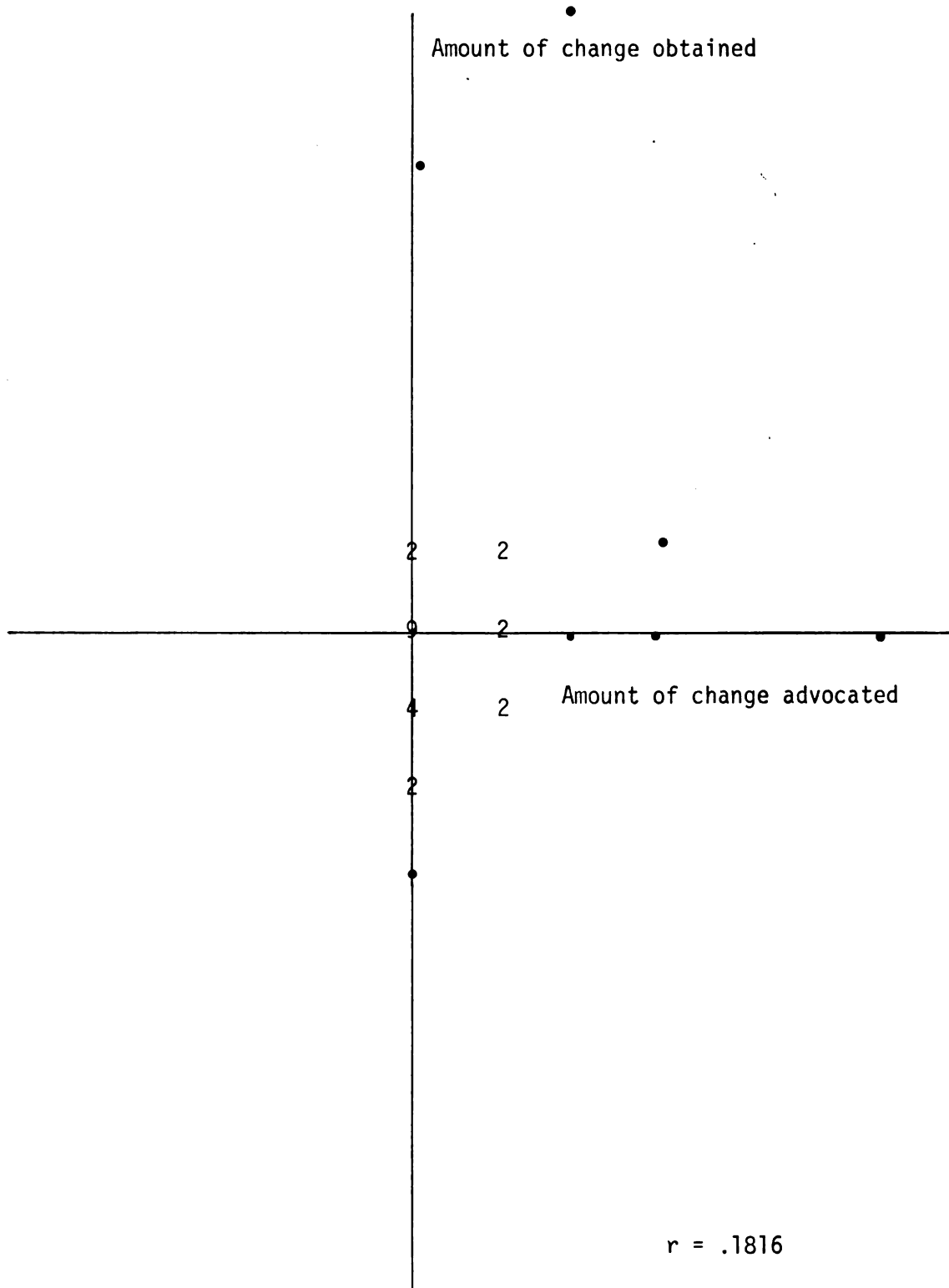


Graph E-15.--Charity Donations-- $\bar{M}_3 - \bar{A}_3$  with  $\bar{A}_4 - \bar{A}_3$ .

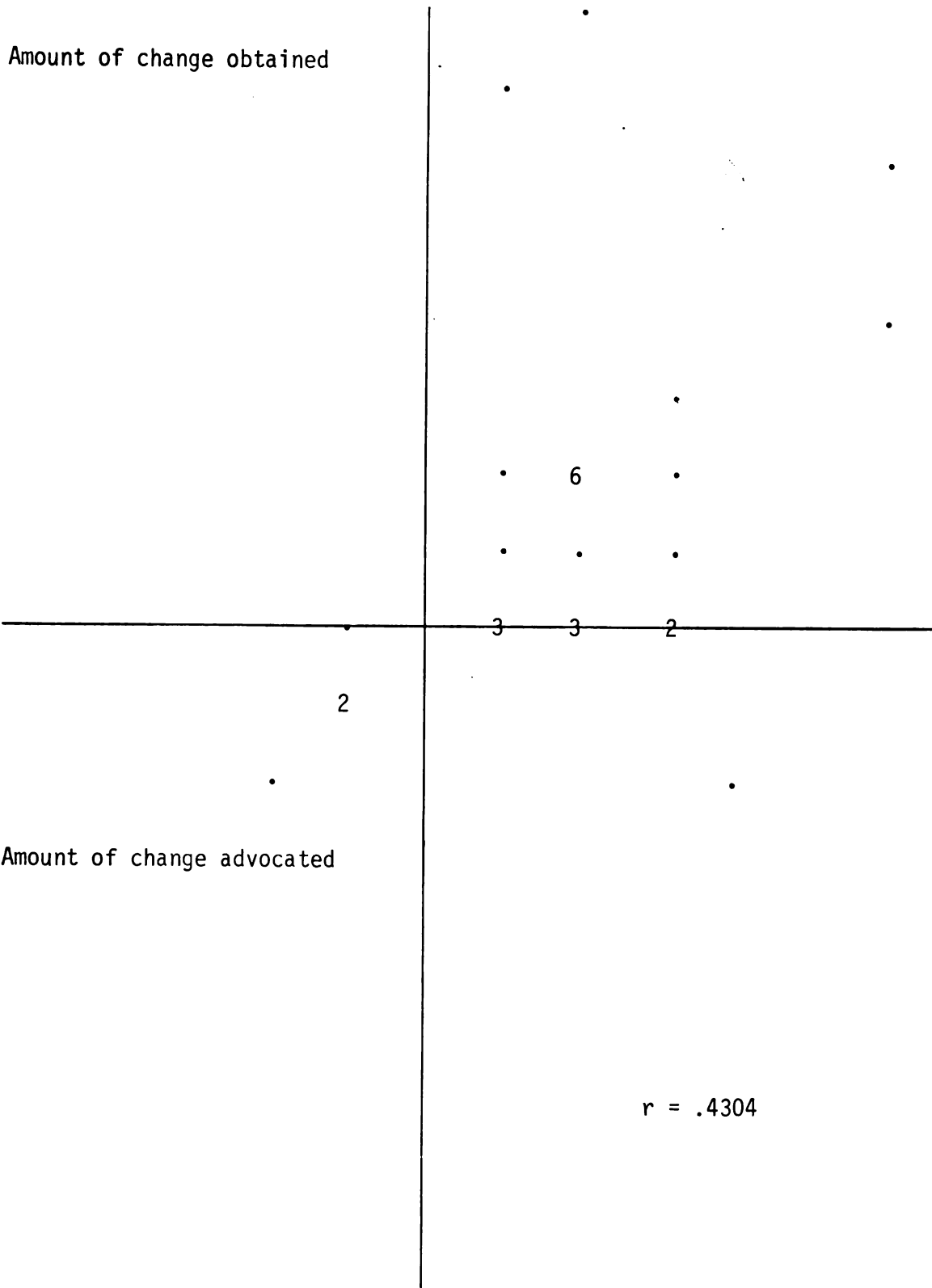


Graph E-16.--Charity Donations-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_3 - \bar{A}_1$ .





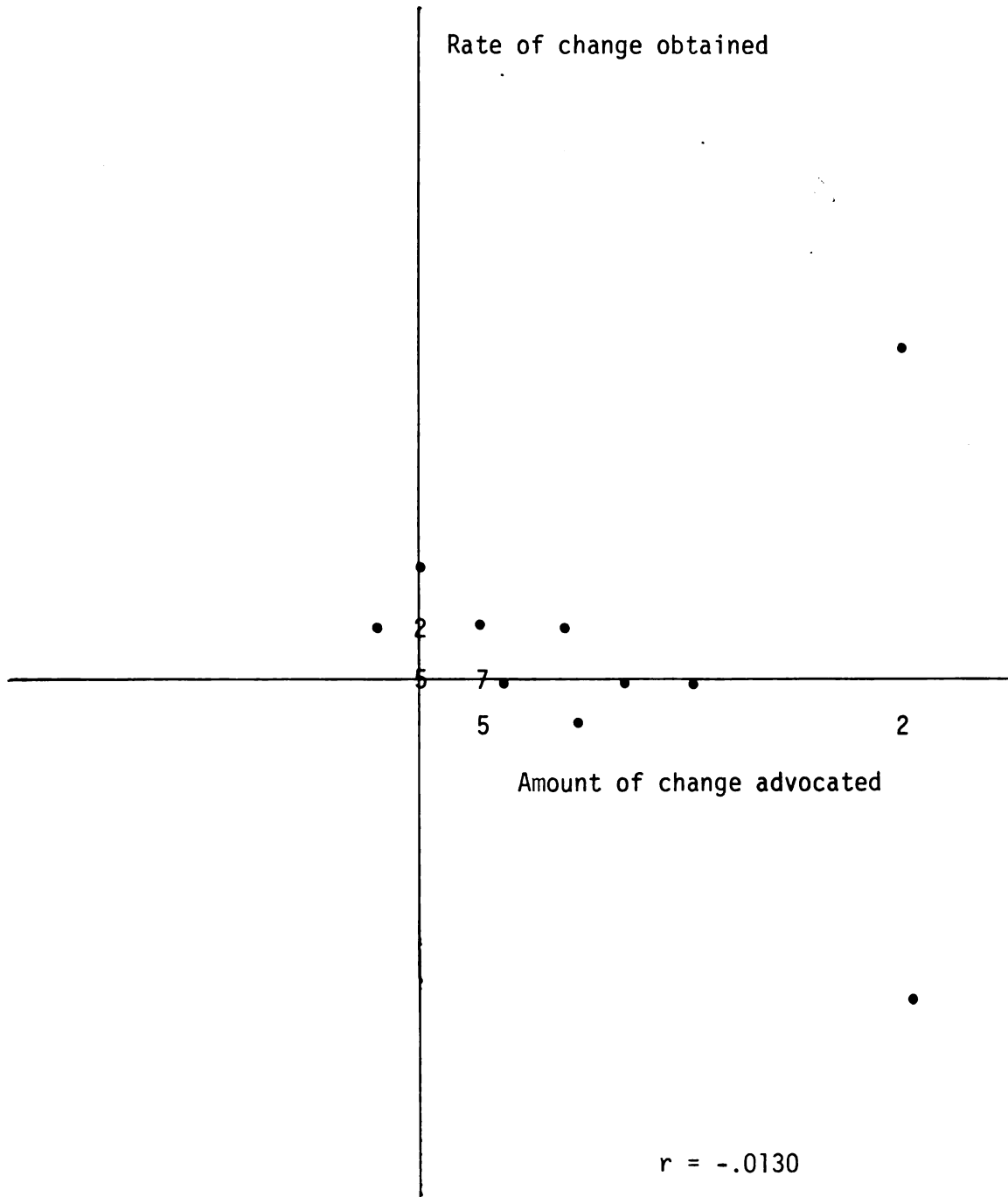
Graph E-17.--Charity Donations-- $\bar{M}_3 - \bar{A}_3$  with  $\bar{A}_5 - \bar{A}_3$ .



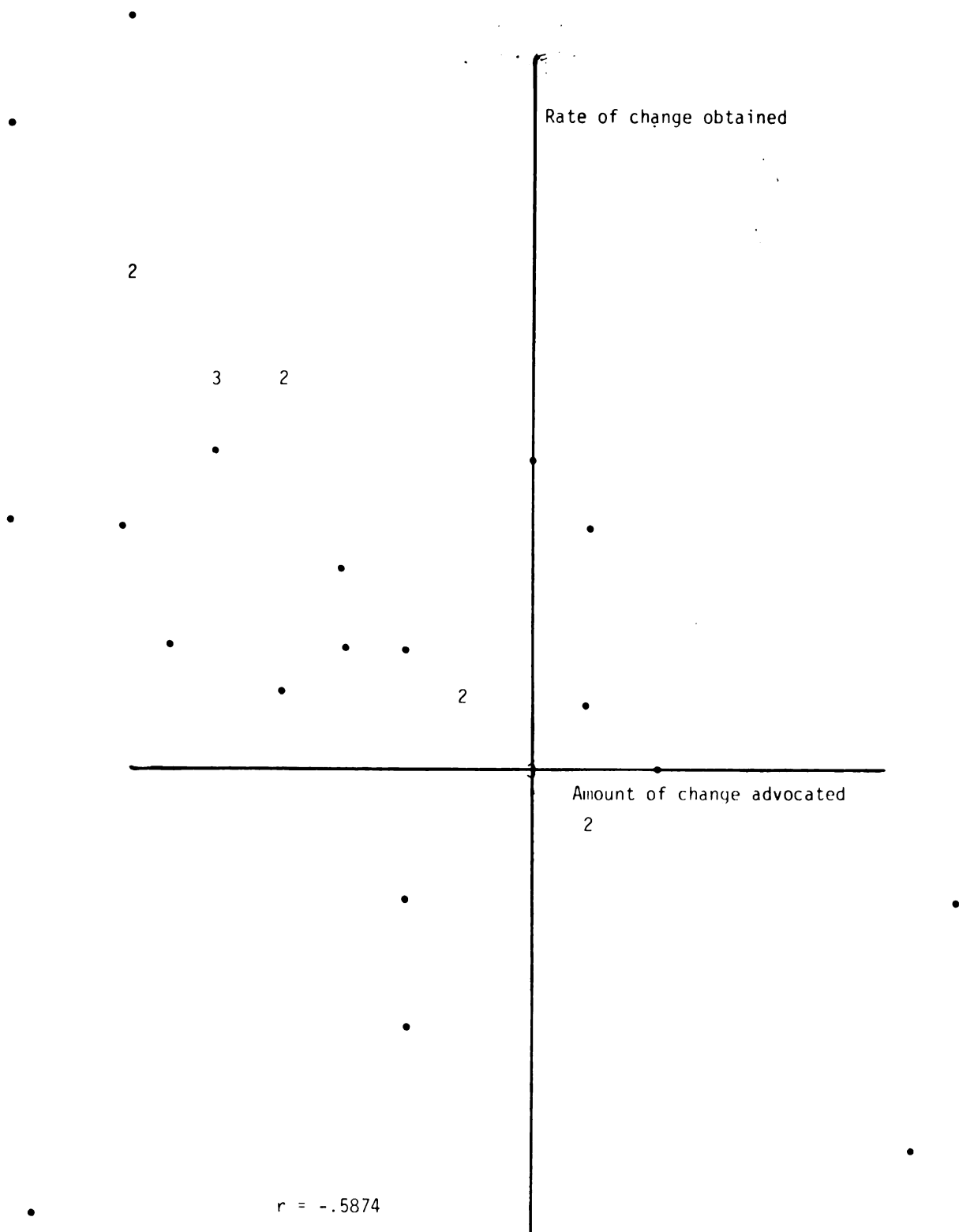
Graph E-18.--Charity Donations-- $\bar{M}_1 - \bar{A}_1$  with  $\bar{A}_5 - \bar{A}_1$ .

APPENDIX F

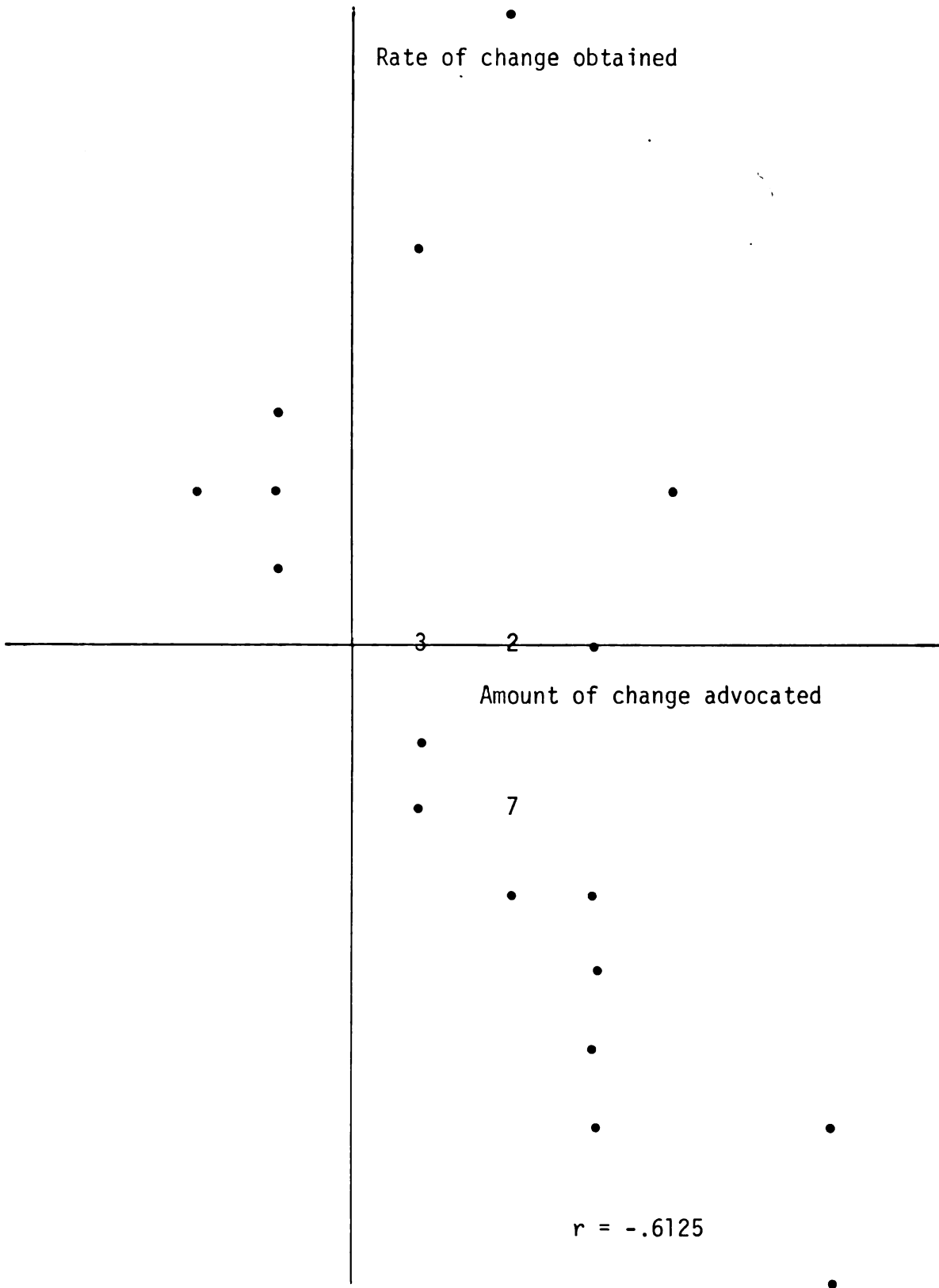
ACCELERATION SCATTERPLOTS



Graph F-1.--Class Size-- $\bar{M}_1 - \bar{A}_1$  with Acceleration.



Graph F-2.--Cancer Funds-- $\bar{M}_1 - \bar{A}_1$  with Acceleration.



Graph F-3.--Charity Donations-- $\bar{M}_1 - \bar{A}_1$  with Acceleration.

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