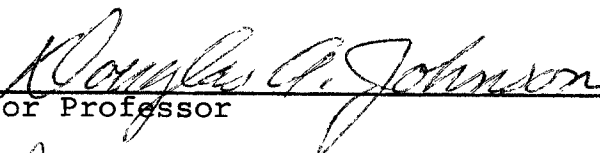
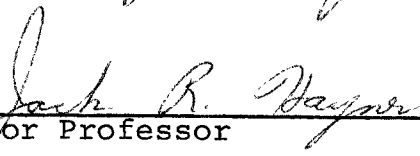



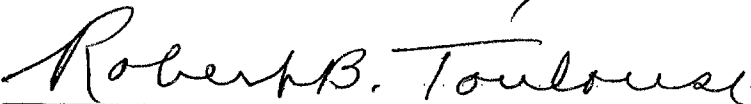
THE XYZ TEST AS A MEASURE OF ATTITUDINAL  
CHANGE RESULTING FROM A MANAGEMENT  
TRAINING AND DEVELOPMENT PROGRAM

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A study was done to test the effectiveness of a managerial training and development program. Seventy-three first-line and middle managers of a medium size oil company were the subjects of this experiment.

The two experimental groups took part in three training seminars which were designed to increase their skills in motivation and supervision. Two weeks prior to the seminars the test instrument was mailed to each participant of the forthcoming seminar. Two weeks after the first experimental group had participated in the seminar, the post-test was mailed to the participants. For the second experimental group, four weeks elapsed between the seminar and the mailing of the same post-test. In addition, a control group was given the pre-test and no intervening practice. The test used for the detection of attitudinal change was the XYZ Test developed by Reddin and Rowell.

The analysis of covariance revealed no attitudinal change. Two possible explanations are given: (a) the seminars produced no change; or (b) the test was not sensitive to change.

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THESIS

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## Introduction

Since the start of the industrial movement, labor and management have struggled to provide the worker, whether white or blue collar, with some way of both learning job skills and improving the skills he already has. On occasion, the effects of this struggle have been questionable. In one particular type of training, the laboratory training group or T-group, the potential for psychological damage to the participant has caused some concern, especially since regulation of those leading these groups has been almost nonexistent. Although a great many evaluative techniques have been utilized, the evidence concerning the benefits of many training methods is sparse. Also, the cyclical nature of fads have to a great extent hindered the number of evaluative studies done on many training techniques (Reeves, 1968). This study explores a training situation in a specific industrial setting, and presents a potential evaluation technique.

## Training in Industry

The variety and number of training methods used in the industrial setting are probably as numerous as the number of organizations using them (Campbell, et al., 1970). However, two classes of methods are generally recognized. The first

classification, on-the-job training, will be dealt with only in passing, since it was not utilized in the training seminars studied in this experiment.

### On-the-Job Training

There are generally six types of on-the-job training: orientation training, job instruction training, apprentice training, (including internships and assistantships), job rotation, coaching, and junior board (Bass and Vaughan, 1966). Generally, these types of on-the-job training are the most common method of employee instruction (Utgard and Dawis, 1970).

Several advantages of on-the-job training over the alternative, off-the-job training, are offered by its proponents. The most important advantage involves the elimination of the transfer of training problem. Since on-the-job training usually involves exactly the same circumstances under which the employee will be working after training, this problem is mostly non-existent. Another advantage of on-the-job training, one which is especially attractive to the employer, is the fact that the employee is producing while he is learning his skills.

There are also some disadvantages evident in this form of training. The personality of the trainer probably has to do not only with the degree of skill the trainee gains but also the skills he learns (Levinson, 1962). High waste, the tying up of equipment, and the pressure of working up to

standards set by trained workers are unfavorable consequences of on-the-job training noted by Bass and Vaughan. Finally, they point out, this method of training becomes only a secondary benefit, since management's main emphasis is on productivity, while the emphasis for the new employee is training. Thus, since on-the-job training suffers from such disadvantages, an alternative, off-the-job training, must be explored.

#### Off-the-Job Training

Off-the-job training is generally involved in the learning of tasks not quite central to job behavior. For example, activities such as interpersonal communication, employee motivation, and team building may not be directly related with personnel management or production management, to the extent that these activities are not taught as part of the formal curriculum of most business schools; however, the success or failure of many management jobs probably lies in such activities. Generally, behaviors (leadership, motivation, communication) which are classified as human relation skills are more readily learned in the off-the-job setting.

Oberg (1963) discusses the advantages of off-the-job training, in light of responses to questionnaires sent to one hundred forty seven executives who had undergone university executive programs. The advantages most often

cited involved concepts which emphasized the individual growth of the participant. First, the programs allow the executive to get away from job pressures and encouraged self analysis and critical evaluation of previous job behavior, especially in terms of "party line" thinking. Second, the programs provide individuals with resource material which provide suggestions and ideas which the executives can fit into their own psychological framework, thus augmenting the process of self-development. Third, off-the-job training may motivate an executive toward self-development through the structuring of a challenging situation.

The obvious disadvantage of off-the-job training involves transfer of training. As indicated earlier, the nature of executive behavior is such that training need not be as specific as compared to the training needs of the blue collar worker. There should be a relationship between management development programs and concepts needed to improve managerial job behavior (performance) (Catalanello and Kirkpatrick, 1968). A review of the literature reveals that most programs claim increases in desired (specific) executive behavior after the undertaking of the program. Later we will see that present evaluative methods and techniques have been weak.

Another disadvantage of off-the-job training emerges when the "trained" executive returns to the organizational milieu. It has been noticed that often the climate of the



organization is unable to reinforce, and thus support the behavioral or attitudinal changes brought on by the program. The training objectives specified (and states sought) and successfully grasped by trainees "on the outside" are often extinguished when returning trainees are subject to the potent organization forces which they have left (Lundberg, 1968). Consequently, Bass and Vaughan (1966) contend that for training and development programs to be successful, the top management must actively support it.

There are numerous types of off-the-job training programs which could be studied in this paper. However, only the types of off-the-job training that are specifically used in the training and development seminars of the ABC Oil Company will be discussed.

The lecture technique is used to a very limited extent in each seminar. The preponderance of negative comments by the participants in the program have restrained the widespread use of such techniques. McGehee and Thayer (1961) suggest that the lecture situation is not appropriate for attitudinal or behavioral change. Others suggest that a lecture before or after a film can provide the participant with an added emphasis, and has been shown to be effective in producing an enduring attitudinal change (Standohar and Smith, 1956). Further, they suggest that a lecture before a film provides more persistent attitude modifications than for those who view the film without a lecture or discussion.

Of itself, the film is a valuable addition to a training and development program. Films tend to add emphasis to the program and have been shown to speed up the learning process, at least for blue collar workers (Fryer and Edgerton, 1950). Films are also used to present real life situations in the case study format so that decisions concerning the outcome of the case can be made by the participants.

The conference of discussion is particularly useful in situations involving both attitudinal change and the transmission and assimilation of conceptual information (Coch and French, 1948). Small discussion groups, i.e. "buzz" groups, have an advantage of being able to facilitate clarification and understanding of the subject. Also, since the buzz group shares some characteristics of the laboratory training group, or T-group, there may be an added reward in the form of induced group cohesiveness. The relatively intimate nature of a small group discussion session usually provides much opportunity for feedback to participants' verbal behavior (Levine and Butler, 1952). In addition, the process of learning is facilitated because a collective search for the "best" answer is usually eliminated. Bass and Vaughan (1966) suggest that through the process of discovery ("inherent" in discussion groups), individual self-development is furthered.

The case study method uses bits of reality to provide the participant with a concrete "digestible" unit for study.

The case study can be taken from a real situation or manufactured by the trainer to support his objectives. The case study has the promotion of the understanding of "underlying principles" as its goal, and in this sense, the case study can be extremely flexible in the attainment of these goals (Glover and Hower, 1952). A case can be presented in which no single point is emphasized. In this situation, only a general feeling of the best answer need be presented by the participant. On the other hand, case studies which allow for only small variation in answers can be designed. An important factor that influences the effectiveness of the case study is the nature and availability of feedback, since obviously, the correct answers to case study problems are not always immediately evident to the participants.

Simulation in off-the-job training has been an important method of training, particularly in the training of motor skills. The effective use of simulators and mock-ups in the aircraft industry is well known and assumes even more importance in the space program. In the field of managerial training and development, the use of business games has become widespread (Greenlaw, Herron, and Rawdon, 1962). Most games, like case studies, simulate real life situations so that optimum transfer of training can occur. Also, the business game presents a dynamic situation in which the trainee must make decisions that have immediate consequences in his

environment. The non-punitive nature of the game situation provides a reinforcing experience for the participant, and allows him to exhibit new behaviors and strategies without risk of punishment (Ohen and Rhenman, 1961). The business game, Greenlaw et al. suggest, generally provides a challenge to the participant and provides him with tools for decision making and team building.

The disadvantages of the business game seem to involve the need of some participant to simply win regardless of whether or not understanding of the processes involved is gained. Of course, the content of the game largely determines what a participant may gain from it. Thus, a game which allows reinforcement for incorrect responses will obviously teach behaviors which at best, have no usefulness in the "real world".

The last type of off-the-job training to be discussed in this paper is laboratory training or T-group. Many types of management development programs are called T-groups. They generally have several central characteristics and goals in common. The common characteristics involve such factors as the following: the group consists of a small number of subjects; it is unstructured, involving interpersonal confrontation; it generally operates on the spontaneous comments of the group members rather than on the prompting of the leader; and it is focused upon the ongoing verbal behavior

of the participants, rather than on past behavior (Campbell and Dunnette, 1968). Most share a set of common goals. Campbell and Dunnette list the predominantly agreed upon outcomes. First, the participant should have increased self-insight concerning his behavior and its effect on others. Second, the participant should have increased sensitivity and awareness to the behaviors of others. Third, he should gain increased awareness of the processes involved in intergroup communications. Fourth, there should be an increase in the quality of diagnostic skill in social, interpersonal, and intergroup communications. Fifth, the participant should gain increased ability to manipulate social situation so as to facilitate inter- or intra-group effectiveness. Sixth, the participant should learn how to learn, especially in terms of his ability to analyze his own behavior and the behaviors of others. Most T-groups seem to specify these outcomes as their goal, although it is understood that various dimensions of these goals can be emphasized more than others.

Generally, the goals of a T-group are formulated in terms of some sort of attitudinal and/or behavior change on the part of the participants (Bunker, 1965). The process of changes induced by a T-group seems to be the result of two factors. The primary factor is the "unfreezing" of old attitudes (Schein, 1969) brought on by confrontation

and by the anxiety generally the group environment. The second factor in the process of change is feedback. Once the anxiety has produced the impetus for the attitude change, feedback from the other members of the group usually assist the participant in guiding himself to new and hopefully more functional attitudes and behaviors as specified by the training goals.

One of the environmental prerequisites of an effective group is the generation of a feeling of psychological "safety". While the group must provide enough confrontation to produce a heightened level of anxiety in the participant, the anxiety must be produced by the participant himself as he and the other members of the group strive to push aside maladaptive defense mechanisms, rather than by ego-defeating criticism (Schein and Bennis, 1965). The openness and willingness to accept the participant is of prime importance in the process of creating a climate of psychological safety. When these requirements are satisfied, attitude change, along with a concomitant behavior change, can take place.

#### The Evaluation of Training Methods

There has been a continuous call for more and better evaluation research on the usefulness of training in industry. Often in this field, the significance of the results of many evaluation attempts are clouded because of poor methodology and experimental design. To this extent, some researchers

have argued that the typical experimental designs used for evaluation (control groups, specified behavioral outcome, etc.) are too limited in the amount of information they produce (Weiss & Rein, 1970, Golembiewski and Carrigan, 1970). In the former article, the authors suggest alternatives to the normal experimental procedure, such as historical research, case analysis, etc., while in the latter, the authors insist that there is merit in controless experimentation. To that argument, however, Becker (1970) suggests that experimentation without control groups may be useful for selling management on a particular training technique, but it is not permissible for science.

There is a growing concensus on what should be the subject of evaluation. First, the training research should attempt to measure participant reaction, or how well they liked the program; second, the research should evaluate learning, how much content was assimilated; third, the research should measure changes in job behavior; and finally, the research should measure results, especially in terms of organizational variables. Generally, it is felt that rarely does any one experimental design attempt to measure all of these factors: usually, one or two of these variables are measured.

Many of the evaluation studies have been done on management development programs. Campbell and Dunnette (1968)

summarize much of the research done in the past two decades on these programs. They divide the research into two groups according to criterion measures used. The measurement of change in job behavior (external criterion) has been utilized much less often than has the measurement of "psychological" change (internal criterion).

Campbell and Dunnette review four articles which use change in job behavior as criterion for training success. All four studies use a "perceived change" measure in the evaluation of the T-group procedure. The perceived change method asks the question: Have you (peer, superior, subordinate) noticed a change in the subject's job behavior (any one of a multitude of possible dependent variable) within the last few months (days, weeks, years). The data are analyzed and a correlation between the T-group experience and job behavior change results. A significant positive change was reported by all.

Possibly the best study done which uses a type of external criteria was one involving eight hundred managers who had undergone a management development program (Blake, et al. 1964). A perceived change measure was also used in this study to test the effectiveness of the training program. In addition, a great many other dependent variables were correlated with this measure. The main organizational variables measured were such things as net profit, controllable operating costs, unit production per employee, etc. In this way, the productivity of the training program was tested.



It was found that the job behavior changes accounted for 13% of the profit increase of the company.

Studies using internal criteria are numerous according to Campbell and Dunnette. Generally they focus on changes in perceived self, interpersonal sensitivity, attitude and personality.

The perceived self studies generally use a measure which is sensitive to perceived self versus ideal self changes. Most studies report a significant reduction in the discrepancy between the real self and the ideal self.

Another measure used as criterion is interpersonal sensitivity. Campbell and Dunnette report several studies which use a questionnaire which measures the discrepancy between how the subject predicted another subject's response to a question and how the other subject did actually respond. Generally, a reduction in discrepancy was reported after laboratory training.

Attitude change is another method of measuring T-group effectiveness used, though rarely. The most widely used instruments for measuring attitude change in this setting have been the Fundamental Interpersonal Relations Orientation Behavior questionnaire (FIRO-B) and, less frequently, the Leadership Opinion Questionnaire (LOQ). The former instrument measures attitudes toward factors involved with control, social isolation, and social warmth. The latter measures

consideration (concern for others), and initiation (concern for getting work done). These measures have shown some sensitivity to changes in attitude after T-group participation, with the FIRO-B showing more consistent results (Schutz and Allen, 1966).

Finally, Campbell and Dunnette state that personality tests have shown completely negative results as measures of T-group effectiveness. With regard to the recent research on the stability of personality patterns, the above results are not surprising.

#### The ABC Oil Company Training Seminar

Several years ago, the ABC Oil Company instituted a series of training seminars for its first-line and middle managers which are intended to increase their understanding of the role and duties of a supervisor within the organization. Three seminars make up the complete training course. The first seminar gives the participant the opportunity to develop his basic leadership skills. The second seminar focuses on interpersonal communication problems in the work setting. The third seminar in the series, and the subject of our investigation, centers around a program on motivation developed by the training and development arm of the Company.

The seminars are held at the Company's training center in an isolated location, and require two and one-half days

for completion. There are eight separate sessions during the two and one half days. (Appendix I)

The seminars strongly favor the environmentalist approach to management. The environmentalist view holds that each individual reacts differently to each situation and organizational stimuli encountered. No one management approach is correct for all individuals or situations. Thus, as the individual actions, duties, and responsibilities of a supervisor are examined, the unique nature of the human individual in situations involving his on-the-job behavior is explored. This view is known in management philosophy as Theory Z.

Theory Z is a pragmatic approach to the nature of man and suggests that man is a rational being, open to and controlled by reason. He is inherently neither good nor evil but is open to both. He is driven by his intellect, and his basic interactional mode is interdependence. Support for such a view is readily available. Locke (Tabula Rasa), Fromm, Sullivan, Kelly, Drucker, and Reddin are proponents of such an environmentalist view (Reddin, 1970).

In contrast there are two other major philosophies of management, known as Theory X and Theory Y (McGregor, 1961). Reddin defines Theory X assumptions of the nature of man in basically this way: Man is basically a beast who is best controlled by civilization. He is inherently evil, and is driven by his biological impulses. His basic interactional

mode is competition. In his book on managerial effectiveness, Reddin lists Hobbs, Machiavelli, Taylor, Weber, and Freud as supporters of this view of man's nature.

Reddin also discusses Theory Y which holds that man is a self motivating entity who works best with few controls. Man is inherently good, and is driven by humanism. His basic interactional mode is cooperation. Reddin notes that McGregor, Likert, Argyris, Herzberg, and Maslow are proponents of Theory Y assumption about the nature of man.

#### The Training Aspect of the Seminar

Each of the first four sessions utilize films distributed by BNA films (BNA 1969, 1972), and produced by Saul Gellerman, which are entitled: "Motivation Through Job Enrichment"; "Theory X and Theory Y"; "Management by Participation"; and "Team Building".

The first film concerns the work of Frederick Herzberg on motivation through job enrichment, and uses Herzberg's Two-Factor Theory of job motivation as a model.

The second film utilizes the work of Douglas McGregor (1961) and describes his best known contributions to the field of organizational behavior, the concepts of Theory X and Theory Y.

The third film is a short discourse on the work of Alfred Morrow, and deals with participative management in the organization. The film discusses ways of promoting participative techniques and describes the benefits of such techniques.

The final film, on team building, was written by Sheldon Davis. The film points out the need for an ongoing system of organizational development which is designed to improve methods of interpersonal contact and cooperation so that organizational goals can be met most efficiently.

These four films are the focal point of each of the first four sessions. The session leader had no standard routine for covering the films, but uses them as a point of departure for a discussion on the topic related to the film.

A short exercise dealing with Theory X and Theory Y is undertaken in the second session. Four "What's Your Theory" questionnaires are given out to everyone, and the participants were asked to fill them out and grade them. The purpose of the exercise was to provide the participants with an opportunity to gain some idea of where they stood on an authoritarian--democratic continuum (Appendix II-VI). The possible influence of this exercise upon the test results is discussed in the discussion section of this paper.

Session five takes place during the evening of day two, and allows for the formation of informal discussion groups and the preparation of questions for the session of in-company problems.

The sixth session takes place on the morning of day three and involves the use of a business game. The membership has previously been divided up into three groups and

each group works independently on the game. The game used is "Supervision" and is produced by Education Research of Somerset, New Jersey. The game employs a technique called programmed simulation in which supervision decisions are required in such a sequence that proper decisions will bring a quick resolution to the problems, and improper decisions quickly compound the problems into a hopeless mess. There is an opportunity for discussion after all groups finish the exercise.

The seventh session involves a discussion of a Position Description and Standards of Performance being implemented by the Company. The motivational aspect of these two programs are discussed with reference to the previous material.

The last session is devoted to Company problems, a session that was deemed important and necessary for future sessions by the participants of previous seminars.

In the closing minutes of the seminar, a trainer evaluation (Appendix VII) is given out to the group members. Since much consideration is given the suggestions included in these ratings, great care is taken to assure the participant that any criticism or suggestion made will be completely confidential, and will in no way endanger his job. No identifying marks, coded or uncoded are allowed on the form. Thus, there is no way of comparing the participant's attitude toward the seminar, with longer term attitudinal change as

measured by a test instrument such as the one utilized in this experiment.

#### Developmental Aspects of the Seminar

To the extent that these seminars utilize many of the procedures involved in laboratory training or T-groups, a limited attitudinal change is generally anticipated. As mentioned earlier, a T-group should be unstructured and involve face-to-face confrontation. It should also be functionally leaderless, be composed of ten to fifteen members, and center on "here and now" behavior.

The Company's seminar's are of a face-to-face nature, and to a large extent functionally leaderless, since in the past there has been a determined effort to eliminate "lectures", and thus a leader, as an instructional medium. Although there are specific topics to be covered in each session, the discussion is allowed to wander about, with the leader discreetly guiding the discussion back to the point when he deems necessary. However, in terms of size, the Company's seminars would be generally too large, when compared to the optimum size recommended by recent T-group technology. The intimacy and "safety" of a five to ten member T-group cannot readily be duplicated in a training seminar of nearly twenty members. Although the main topic of discussion of each session does not focus upon the "here and now" behavior of the participants, intra-group confrontation is not discouraged.

An effort is made to have as many different levels of supervisors as possible in each group. In most groups there are individuals with backgrounds in accounting, engineering, earth sciences, data processing, production, sales, purchasing, and general clerical. No superior-subordinate relations exist between any two members of any one group.

No rigid time schedule is maintained within each session. The trainees are urged to participate thoroughly within the seminar setting, to question the material and each other, to give examples where pertinent, and to attempt to form a group understanding of each topic. Within this framework the seminar moderator attempts to keep the discussion upon the central topic, and to draw out each participant on his feelings and beliefs.

#### Hypothesis

This study will test the hypothesis that due to the T-group-like nature of the seminars, they will be effective in producing a significant attitude change as measured by the XYZ Test published by Organizational Tests Ltd. Second, due to the emphasis upon the environmentalist view of the nature of man taught in the seminar, the change should take the form of a significant increase in the factor Z score along with a concomitant reduction in either factor X or Y, or a reduction in both.



## Method

### Subjects

The subjects for this experiment were seventy-three first line and middle managers of the ABC Oil Company. The subject pool consisted of sixty-eight men and five women. The age range of the subjects varied from twenty-two to sixty years, with most subjects falling in the thirty-five to forty-five year range. The range of educational achievement of the group was from high school to master's level.

The median educational level was approximately fourteen years for both the experimental and control groups. All subjects had been drawn from a cross section of occupational and geographical backgrounds within the company, and had participated in the first two seminars of the series while in the same group. All participants in the experimental group had been managers at least three years and varied in length of managerial service time for the company from three to twenty years. There were no superior-subordinate relationships in any group.

### The Seminar

The experimental group subjects took part in a training and development seminar, the last in a series of three, which was designed to develop leadership skills and an understanding of human and organizational behavior. The seminars are given yearly so that a manager usually completes the series in

three years. The first seminar emphasizes leadership development, the second seminar is devoted to the investigation and improvement of communication skills, and the third covers motivation and skills involved in supervision. The seminars used the job training techniques of: lecture (to a limited extent), films, discussions, including smaller "buzz" groups, simulation, specifically a business supervision game and case study. To a limited extent, the seminar duplicated some of the aspects of T-group.

The seminars took place at the Company's recreational facilities which are relatively isolated, so that no contact with anyone other than service personnel was possible.

### Instrument

The instrument used in this study was the XYZ Test developed by W. I. Reddin and D. R. Rowell of Organizational Tests Ltd. and the University of New Brunswick (Appendix X). The instrument was designed to yield scores on three factors which the authors call X, Y, and Z. Factor X is a measure of McGregor's concept of Theory X view of the nature of man; Factor Y on the test corresponds to McGregor's Theory Y view of man; and Factor Z corresponds to a Theory Z view of man which is essentially an environmentalist position.

The scoring guide (Reddin and Rowell, 1972) gives only norms for the test, with no supporting data. The authors suggest that although the test has been utilized as

training effectiveness measure the reliability and validity verification have been "largely informal". In a personal communication, Reddin stated that large scale evaluation programs were underway, but that the results would not be available until "later this year" (1972).

The test is forty-two items long. Each item consists of two statements between which the subject is able to divide a total of three points in any combination (3-0, 2-1, 1-2, and 0-3). When the items weights are tabulated a total score for each factor results. The total score for all three factors must equal one hundred twenty-six. Thus, all three factors scores are interdependent upon each other. A high score on one factor results in a lower score for another factor or the other two factors. In this way some relative comparison of the subjects attitude toward the nature of man can be gained.

#### Procedure

The first two motivation seminar groups were placed in the first experimental group, and the second two motivation seminar groups placed in the second experimental group. Sixteen days prior to each seminar, a copy of the test instrument was mailed to each participant of that particular seminar with instructions asking the individual to fill out and return it within two days (Appendix VIII). Two weeks after

the two day grace period for returning the tests, a seminar took place. In order to avoid contamination, no questions concerning the tests were answered at the seminar.

Two weeks after the end of the seminar, the retest was mailed to the participants of seminar groups one and two, those groups which make up Experimental Group I. The instruction also asked that the participants fill out and return the test within two days (Appendix IX).

The same pre-test procedure was used for seminar groups three and four, Experimental Group II. On the post-test for Experimental Group II, however, the interval between the end of the seminar and the mailing of the test was twenty-eight days.

In addition, a Control Group of thirty-two slightly younger managers was used. The subjects who made up the Control Group had undergone the second in the series of Company seminars (communication), two weeks prior to receipt of the pre-test. Six weeks after receipt of the pre-test, with no intervening training, the Control Group was sent the post-test.

The experimental design allowed for not only the measurement of pre-test to post-test differences, but also the stability of the differences. A total of ninety-nine pre-tests were mailed by the Company. All were returned within ten days. The modal value for time from mailing by the

Post-tests were mailed to all participants who had completed the pre-tests. There were a total of seventy-eight post-tests received. Although only seventy-three were received in time to be utilized in this study. Twenty-six participants made up Experimental Group I; Twenty-three participants made up Experimental Group II; and Twenty-four participants made up the Control Group.

Test forms, instruction, and letters of introduction were identical for all three conditions.

### Results

The pre- and post-test scores for each subject were entered on data cards at the North Texas State University Computing Center. The data was processed by an IBM 360 Model 50 Computer operated by NTSU. A simple analysis of covariance program was run, and the resulting data are shown in Appendix X-XV. Appendix X, XI, and XII show the sums of squares, variance estimates, degrees of freedom, and resulting F ratio for each group (pre- and post-test) on factors X, Y, and Z respectively. Appendix XIII, XIV, and XV show the means and standard deviations for each group, on the same factors.

No F ratio was significant, although F did approach significance for factor Z ( $p = .08$ , Appendix XIV). The results suggest that there were no significant changes for any factor. Thus, no support for the research hypothesis was found.

### Discussion

The hypothesis was clearly not supported. There are two possible reasons for this. First, no change in attitude occurred. Second, change may have occurred but was not measured by the XYZ Test.

The fact that the seminar did not involve direct confrontation or focus on the "here and now" behavior of the participants make the possibility of attitudinal change suspect. However, even though it is recognized that these factors must be present for changes to take place, their absence does not eliminate the possibility that changes in fact did take place. Several factors suggest this possibility. First, the seminars did focus upon teaching the participant the Theory Z (Factor Z) orientation, namely, that the environment and thus the organizational climate largely control what "side" of the nature of man both they and their subordinates present in the work setting. Second, the feedback on the "What's Your Theory" (of work, organization, administration, and government) exercise, in combination with both the trainer's and peer group's admonition to deal with the "situation" rather than the metaphysical aspect of man's essence (Theory X or Y view), hopefully brought the point of the seminar, at least, into the participants' realm of awareness. Third, the business game did underline the above point to the extent that "pat" answers and answers

based on a stereotyped view of man would not only fail to alleviate the problem but also often compound the problem to an impossible point.

There is also the possibility that although the seminar was effective in producing attitudinal and behavioral changes, the progress of the changes occur in such a way that several months must elapse before the changes become evident. There is experimental evidence to support this view, however, no one seems to know why the changes take so long to become apparent (Schutz and Allen, 1966).

There is also the unproven nature of the measurement instrument to take into account. Two main problems are evident in the test: first, the lack of validity studies; second, the lack of reliability studies.

Although the XYZ test does have some face validity, it is known that face validity alone is not enough to justify its presentation as an effective evaluation instrument. It is felt that in offering the test for sale as an evaluation instrument based on only "informal" validity studies, the test authors committed a breach of ethics. The above is also true of the lack of evidence concerning test reliability. Thus, it is noted that when utilizing an unproven measurement device, whatever results are found, whether significant or not, are open to serious question.

### Suggestions for Future Research

Throughout its history, the field of training seminar evaluation has been almost completely dominated by the use of internal change measures such as the one used in this study. Only recently has there been a move toward the use of external criterion. There is one main reason for this, and the reason involves the difficulty in defining and measuring job performance. However, as evaluation techniques improve and the emphasis of all phases of testing shifts from the measurement of internal states to the measurement of job behavior, the accurate prediction of the effects of training will become a reality.

Several suggestions can be made concerning the utilization of data obtained during the Companies seminars. Although trainer ratings (Appendix VII) are gathered during the closing minutes of the seminar, no attempt has been made to incorporate this information into an experimental design. This is considered a great waste of potentially valuable data, since a knowledge of the relationship between attitude toward the seminar (as measured by the Training Evaluation form), and attitudinal change resulting from the seminar (as measured by an accurate predictor of such change) could be useful in predicting which participants would gain the most from the seminar.



Various reasons for not utilizing this data are given by the training development arm of the Company. One reason given is that the trainer rating in its present form is not readily quantifiable. Also, after examining several hundred previous ratings using the form, it becomes obvious that the form is not sensitive to the participant's actual feelings towards the seminar. However, the potential of such a rating warrants its further development.

It is also noted that no test of "information gained" was used before, during, or after the seminar. Such a test would be useful in finding the weaknesses, in terms of information transmitted, of the seminar. Several excuses have been given for the lack of such an exercise; one in particular involves the desire not to destroy the T-group like nature of the seminar. However, without the anxiety generating, direct confrontation, the T-group aspect of the seminar is probably limited anyway.

Finally, future studies should involve the measurement of some sort of job behavior change (external criteria). The future of training and training evaluation lies in this area of evaluation technique, and especially in the evaluation of organizational results. When a training method, through improved evaluation techniques, is repeatedly shown to significantly improve such things as employee satisfaction and output per man hour (thus, net profit), the effectiveness

of that particular method of training will have been demonstrated and the role of training in industry indisputably established.

APPENDIX I

SCHEDULE OF ACTIVITIES:

Day 1

|            |           |
|------------|-----------|
| 6:00- 6:30 | Cocktails |
| 6:30- 7:00 | Dinner    |

Day 2

|             |  |
|-------------|--|
| 7:00- 8:00  | Breakfast                                  |
| 8:00-10:00  | Class-Motivation Through Job<br>Enrichment |
| 10:00-10:30 | Coffee                                     |
| 10:30-12:30 | Class-Theory X and Theory Y                |
| 12:30- 1:30 | Lunch                                      |
| 1:30- 3:30  | Class-Management by Participation          |
| 3:30- 4:00  | Coffee                                     |
| 4:00- 6:00  | Class-Team Building                        |
| 6:00- 6:30  | Cocktails                                  |
| 6:30- 7:30  | Dinner                                     |
| 7:30-       | Separate Group Discussions                 |

Day 3

|             |  |
|-------------|--|
| 7:00- 8:00  | Breakfast                                |
| 8:00-10:00  | Class-Group Project                      |
| 10:00-10:30 | Coffee                                   |
| 10:30-12:30 | Class-Recapitulation of Project          |
| 12:30- 1:30 | Lunch                                    |
| 1:30- 3:30  | Class-Problem Presentation               |
| 4:00        | Airplane departs for (a main<br>airport) |

## APPENDIX II

### WHAT'S YOUR THEORY?

(of WORK)

**Explanation:** This exercise is designed to help you clarify your thinking about one of the major responsibilities of managers-- the responsibility to encourage and facilitate top-level performance on the part of employees.

Theories of work provide plausible explanations for the varying interest, enthusiasm, and effectiveness with which workers accept and perform their assignments. The nine statements below suggest the range of explanations for these variations in work.

**Directions:** First, read all of the statements carefully. Second, select the three that seem to you to be least plausible or adequate and mark them with a minus sign (-). Then, from the six that remain, select the three that you regard as best or most plausible and mark them with a plus sign (+).

1. \_\_\_\_\_ Economic necessity is the only effective spur to increased contributions from most workers.
2. \_\_\_\_\_ The surest way to encourage a worker's maximum contribution is to offer him financial rewards for doing more.
3. \_\_\_\_\_ Most workers prefer a job that requires very little thought.
4. \_\_\_\_\_ Most workers try harder to carry out decisions if they have a hand in making them.
5. \_\_\_\_\_ Maximum worker contribution can only be expected if jobs provide opportunities for self-development and social satisfactions.
6. \_\_\_\_\_ For most employees, what they do is not as important as what they earn.
7. \_\_\_\_\_ High employee morale, including loyalty to the working organization, is the best assurance of maximum worker effort and contribution.
8. \_\_\_\_\_ Only a few can contribute creatively in work; the rest must always be told in detail what to do.
9. \_\_\_\_\_ Personal conscience cannot assure a fair day's work from most workers; performance standards must be enforced.

APPENDIX III  
WHAT'S YOUR THEORY?  
(of ORGANIZATION)

**Explanation:** This exercise is designed to help clarify your thinking about a major responsibility of managers--the responsibility for maintaining an effective organizational setting for work.

Theories of working organizations provide plausible explanations for the varying effectiveness of such organizations, relating their success to differences in structures and concepts. The nine statements below suggest the range of these explanations.

**Directions:** First, read all of the statements carefully. Second, select the three that seem to you to be least plausible or adequate and mark them with a minus sign (-). Then, from the six that remain, select the three that you regard as best or most plausible and mark them with a plus sign (+).

1. \_\_\_\_\_ A common source of weakness in business organizations is their tendency to neglect owner interests and wishes.
2. \_\_\_\_\_ The genius of the organization is its ability to develop and coordinate the specialization of managers and workers.
3. \_\_\_\_\_ Employees work harder and contribute more when they regard authority and status in their work as earned and reasonable.
4. \_\_\_\_\_ Workers agree to make the organization's goals their goals when they accept wages for their work.
5. \_\_\_\_\_ The organization that succeeds tends to regard worker-members as the basic source of its authority.
6. \_\_\_\_\_ The key to efficient organization is mainly the assignment of tasks and authority to specialists.
7. \_\_\_\_\_ Coordinated specialization makes the structure of the organization; employee acceptance and approval give it life.
8. \_\_\_\_\_ Organizational effectiveness is increased by broadening the base of employee participation.
9. \_\_\_\_\_ The most effective working organizations concentrate on implementing the authority and decisions of owners.

## APPENDIX IV

### WHAT'S YOUR THEORY?

(of ADMINISTRATION)

**Explanation:** This exercise is designed to help you clarify your thinking about the central responsibility of managers--that of managing or administering in a working organization.

Theories of administration provide plausible explanations for differences in the effectiveness of managers, relating these variations to manager characteristics, policies, and practices. The nine statements below suggest the range of these explanations.

**Directions:** First, read all of the statements carefully. Second, select the three that seem to you to be least plausible or adequate and mark them with a minus sign (-). Then, from the six that remain, select the three that you regard as best or most plausible and mark them with a plus sign (+).

1. \_\_\_\_\_ Managers should set standards of knowledge and competence and certify fellow-managers through their professional associations.
2. \_\_\_\_\_ The best managers are those who rely on logically developed rules and regulations to solve problems.
3. \_\_\_\_\_ As management or administration is essentially an art, research can contribute little to its improvement.
4. \_\_\_\_\_ Managers should subordinate employer goals to the manager's professional code of ethics and social responsibility.
5. \_\_\_\_\_ Every successful business institution is the lengthened shadow of a great manager.
6. \_\_\_\_\_ The most important attributes of the effective manager are detailed knowledge of his field and ability to make decisions.
7. \_\_\_\_\_ The formula for administrative success requires inspired leadership plus precise organization.
8. \_\_\_\_\_ Managerial success is mostly determined by the unique ability to gain and hold the personal loyalty of assistants.
9. \_\_\_\_\_ Successful managers must recognize their accountability to employees as well as to owners.

## APPENDIX V

### WHAT'S YOUR THEORY?

(of the ROLE OF GOVERNMENT)

**Explanation:** This exercise is designed to help you clarify your thinking about the role of government in modern employment relationships.

Theories of the role of government provide plausible explanations for various degrees of public regulation and intervention. The nine statements below suggest the range of these explanations.

**Directions:** First, read all of the statements carefully. Second, select the three that seem to you to be the least plausible or adequate and mark them with a minus sign (-). Then, from the six that remain, select the three that you regard as best or most plausible and mark them with a plus sign (+).

1. \_\_\_\_\_ Government regulation frequently stifles initiative and investment and employment opportunities.
2. \_\_\_\_\_ With respect to employment relationships, that government is best which governs least.
3. \_\_\_\_\_ Government regulation of employment often forces more efficient management.
4. \_\_\_\_\_ Government regulation of union-management relations should do little more than maintain a balance of power between employers and unions.
5. \_\_\_\_\_ Our basic freedoms require that government give top priority to the protection of private property in employment.
6. \_\_\_\_\_ Government must play a growing role in supervising the relationships of work.
7. \_\_\_\_\_ With only a little regulation, the competitive system will insure fairness to all in employment.
8. \_\_\_\_\_ Government should do whatever is necessary to insure the security, comfort, and welfare of all its citizens.
9. \_\_\_\_\_ Government intervention in employment is essential to keep both employers and unions in their places.

APPENDIX VI

TRAINING, TRAINER EVALUATION

Leader \_\_\_\_\_ Subject \_\_\_\_\_

Date \_\_\_\_\_

1. Was the Subject Pertinent to Your Needs and interests?

- No             To Some Extent             Very Much So

2. How Was the Ratio of Lecture to Discussion?

- Too Much Lecture             O. K.             Too Much Discussion

3. Rate the Leader on the Following:

|  | Excellent | Very Good | Good | Fair | Poor |
|--|-----------|-----------|------|------|------|
| A. How well did he state objectives                            |           |           |      |      |      |
| B. How well did he keep the session alive and interesting?     |           |           |      |      |      |
| C. How well did he use the blackboard, charts, and other aids? |           |           |      |      |      |
| D. How well did he summarize during the session?               |           |           |      |      |      |
| E. How well did he maintain a friendly and helpful manner?     |           |           |      |      |      |
| F. How well did he illustrate and clarify the points?          |           |           |      |      |      |
| G. How was his summary at the close of the session?            |           |           |      |      |      |

What is Your Overall Rating of the Leader?

- Excellent     Very Good     Good     Fair     Poor

4. What Would Have Made the Session More Effective?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5. What Subjects Should Be Covered in later Seminars?

\_\_\_\_\_  
 \_\_\_\_\_

6. Make Any Other Suggestions Pertaining to Training, Facilities, Transportation on the Reverse.



APPENDIX VII

INTER-OFFICE CORRESPONDENCE

PARTICIPANTS

Developing Supervisory Leadership Skills Seminar  
Communications Seminar

Motivation Seminar

Date .

om .

Subject . Test Validation

Attached is a test which we are attempting to validate for use within the company. The test will be used to judge the effectiveness of the training materials, and of the trainer, and will not be used to judge the person taking the test. Only total group results will be studied, not individual results, and all results will be considered confidential.

The attached test is in two parts, Questions 1-21 and Questions 22-42. Please complete both parts and return them to me within two (2) days.

In determining the validity of a test, as many people as possible are needed to better establish a group result for the test. For that reason I ask that all of you complete the tests and return them to me.

Please write your name on the first page of each of the two tests, so that a relationship between test scores and the training you have received can be established.

My sincere thanks for your cooperation.

APPENDIX VIII

INTER-OFFICE CORRESPONDENCE

PARTICIPANTS

Developing Supervisory Leadership Skills Seminar

Communications Seminar

o . Motivation Seminar **Date** .

om .

subject . Test Validation

I must ask again for your cooperation in the validation of the attached test. This is the final operation in the validation study, and again, I must request participation from all of you in order to have the most reliable group results.

Please complete both of the attached tests and return them to me within two days. Also, be certain to write your name on the first page of each of the tests.

Your patience and your help are greatly appreciated.

Instructions For Answering

Read the first set of two statements (1A and 1B) and decide to what extent you agree with each. Assign exactly three points between the two statements. The more points you give a statement the more you agree with it.

EXAMPLE 1

Suppose you agree fully with Statement A and disagree with Statement B you would distribute your points in this way.

1. 3 A. Statement  
0 B. Statement

EXAMPLE 2

Suppose you agree with Statement B and don't totally disagree with Statement A, then you might distribute the points this way.

2. 1 A. Statement  
2 B. Statement

1. \_\_\_\_\_ A. People like to compete with each other.  
 \_\_\_\_\_ B. People prefer cooperation above all else.
2. \_\_\_\_\_ A. To get a person to perform most effectively it is best to offer a reward.  
 \_\_\_\_\_ B. The best way to understand people is to see them as reasoning human beings.
3. \_\_\_\_\_ A. The majority of people trust each other.  
 \_\_\_\_\_ B. Clear explanations usually lead to higher levels of cooperation.
4. \_\_\_\_\_ A. People will work harder when competing with one another.  
 \_\_\_\_\_ B. Man is best understood when studied as a social being.
5. \_\_\_\_\_ A. The main reason most people work is for money.  
 \_\_\_\_\_ B. The only function of discipline is to prevent reoccurrence.
6. \_\_\_\_\_ A. The true function of government is to aid society.  
 \_\_\_\_\_ B. Man always prefers to reason with other men.

7. \_\_\_\_\_ A. Most successful people compete well.  
\_\_\_\_\_ B. Teamwork usually produces good results.
8. \_\_\_\_\_ A. People will usually do a better job if offered more money.  
\_\_\_\_\_ B. Man usually does what he thinks he should.
9. \_\_\_\_\_ A. Man responds more readily to encouragement than to punishment.  
\_\_\_\_\_ B. Successful people know how and when to depend on others.
10. \_\_\_\_\_ A. The basic function of government is to control society.  
\_\_\_\_\_ B. Man's future is promising.
11. \_\_\_\_\_ A. Most successful leaders have to learn that to divide and rule is sometimes a necessary management technique.  
\_\_\_\_\_ B. The best way to get someone to do a job well is to clearly explain what is involved.
12. \_\_\_\_\_ A. Work is as natural as play or rest.  
\_\_\_\_\_ B. Governments should influence man by reason.
13. \_\_\_\_\_ A. People will sometimes interfere with what other people want to do just to gain an advantage for themselves.  
\_\_\_\_\_ B. People enjoy working and living with other people.
14. \_\_\_\_\_ A. There is no particular reason to be optimistic about man's future.  
\_\_\_\_\_ B. Individual behavior depends primarily on the forces in the situation.
15. \_\_\_\_\_ A. Everyone could like everyone else.  
\_\_\_\_\_ B. Followers are best controlled when the situation as they see it is understood.
16. \_\_\_\_\_ A. Teamwork often results in compromise.  
\_\_\_\_\_ B. A man should be willing to die to save his friends.
17. \_\_\_\_\_ A. When all things are considered man does as at least as much harm as good.  
\_\_\_\_\_ B. The best method of leadership is to size up the situation first and then take action.

18. \_\_\_\_\_ A. Do only to other people what you would have them do to you.  
\_\_\_\_\_ B. The future of man is what man wants it to be.
19. \_\_\_\_\_ A. Man's life is a continual attempt to satisfy his personal needs.  
\_\_\_\_\_ B. When people cooperate with one another they usually produce more.
20. \_\_\_\_\_ A. Most men look out for themselves first.  
\_\_\_\_\_ B. Man is very adaptable.
21. \_\_\_\_\_ A. Most successful people cooperate well with others.  
\_\_\_\_\_ B. The best way to motivate some one is to let him know how he is doing.

XYZ TEST

Instructions for Answering

Read the first set of two statements (1A and 1B) and decide to what extent you agree with each. Assign exactly three points between the two statements. The more points you give a statement the more you agree with it.

EXAMPLE 1

Suppose you agree fully with Statement A and disagree with Statement B you would distribute your points in this way.

1.   3   A. Statement  
  0   B. Statement

EXAMPLE 2

Suppose you agree with Statement B and don't totally disagree with Statement A, then you might distribute the points this way.

2.   1   A. Statement  
  2   B. Statement
22.        A. Some competition is healthy but too much of it results in unnecessary conflict.  
       B. A man's most useful resource is his friends who know him well.
23.        A. Man fights only when he does not want peace.  
       B. Man is essentially a naked ape.
24.        A. When one has followers it is best to treat them as friends.  
       B. Discipline is a good way to correct violations and improve performance.
25.        A. Each man decides his own life.  
       B. People work best with friends.
26.        A. Change tends to stabilize rather than to upset things.  
       B. Warfare is a natural human condition.
27.        A. Men will harm other men only when forced to.  
       B. True teamwork is almost impossible to achieve.

28. \_\_\_\_\_ A. Lack of knowledge is the main thing holding mankind back.  
\_\_\_\_\_ B. Man's life is best seen as a constant attempt to improve himself and his society.
29. \_\_\_\_\_ A. Man's greatest ability is to reason.  
\_\_\_\_\_ B. Leaders tend to serve their own needs first.
30. \_\_\_\_\_ A. A man will protect his friends before saving himself.  
\_\_\_\_\_ B. Man has not yet earned himself a peaceful life.
31. \_\_\_\_\_ A. Life would be better if man made more use of his brain.  
\_\_\_\_\_ B. True teamwork is worth working for and with effort easy to achieve.
32. \_\_\_\_\_ A. Man finds the human condition painful because of his intelligence.  
\_\_\_\_\_ B. Man is by nature destructive.
33. \_\_\_\_\_ A. People have more strengths than weaknesses if only they are motivated to use them.  
\_\_\_\_\_ B. Pollution is caused by man's selfishness.
34. \_\_\_\_\_ A. Man has the potential ability to be effective in almost any situation.  
\_\_\_\_\_ B. Leaders serve their followers' needs first.
35. \_\_\_\_\_ A. True teamwork is worthwhile but difficult to achieve.  
\_\_\_\_\_ B. Man has more weaknesses than strengths.
36. \_\_\_\_\_ A. Man is constructive by his inherent nature.  
\_\_\_\_\_ B. There is no real evidence that man can control his natural instincts.
37. \_\_\_\_\_ A. The best way to understand people is to see them as reasoning human beings.  
\_\_\_\_\_ B. Cooperation is natural to man.
38. \_\_\_\_\_ A. Man usually does what he thinks he should.  
\_\_\_\_\_ B. Bargaining is as natural to man as eating and sleeping.
39. \_\_\_\_\_ A. Man does not need to be governed by laws.  
\_\_\_\_\_ B. People usually get what they deserve.

40. \_\_\_\_\_ A. The future of man is what man wants it to be.  
\_\_\_\_\_ B. Performance is not increased by discipline.
41. \_\_\_\_\_ A. Man fights only when he does not want peace.  
\_\_\_\_\_ B. Mankind lives in fear of pain and suffering.
42. \_\_\_\_\_ A. Man does more good than harm.  
\_\_\_\_\_ B. To really understand man we should study animal behavior.



APPENDIX X

ANALYSIS OF COVARIANCE

TEST FACTOR X

| Source  | Degrees of Freedom | Sum of Squares | Variance Estimate | F    | P    |
|---------|--------------------|----------------|-------------------|------|------|
| Between | 2.                 | 10.91          | 5.46              | 0.35 | 0.71 |
| Within  | 69.                | 1075.70        | 15.59             |      |      |
| Total   | 71.                | 1086.61        |                   |      |      |

APPENDIX XI

ANALYSIS OF COVARIANCE

TEST FACTOR Y

| Source  | Degrees of Freedom | Sum of Squares | Variance Estimate | F    | P    |
|---------|--------------------|----------------|-------------------|------|------|
| Between | 2.                 | 7.54           | 3.77              | 0.30 | 0.74 |
| Within  | 69.                | 877.10         | 12.71             |      |      |
| Total   | 71.                | 884.65         |                   |      |      |

APPENDIX XII

ANALYSIS OF COVARIANCE

TEST FACTOR Z

| Source  | Degrees of Freedom | Sum of Squares | Variance Estimate | F    | P    |
|---------|--------------------|----------------|-------------------|------|------|
| Between | 2.                 | 57.04          | 28.52             | 2.66 | 0.08 |
| Within  | 69.                | 738.53         | 10.70             |      |      |
| Total   | 71.                | 795.57         |                   |      |      |

APPENDIX XIII

MEANS AND STANDARD DEVIATION

TEST FACTOR X

| Group                            | Condition | Mean  | Standard Deviation | Adjusted Group Means |
|----------------------------------|-----------|-------|--------------------|----------------------|
| Total<br>N=73                    | Pre-test  | 41.14 | 4.87               |                      |
|                                  | Post-test | 40.96 | 4.12               |                      |
| Experimental<br>Group I<br>N=26  | Pre-test  | 41.46 | 4.96               | 41.37                |
|                                  | Post-test | 41.46 | 4.02               |                      |
| Experimental<br>Group II<br>N=23 | Pre-test  | 40.87 | 4.65               | 41.03                |
|                                  | Post-test | 40.96 | 3.43               |                      |
| Control<br>Group<br>N=24         | Pre-test  | 41.04 | 5.15               | 40.44                |
|                                  | Post-test | 40.42 | 4.86               |                      |

APPENDIX XIV

MEANS AND STANDARD DEVIATION

TEST FACTOR Y

| Group                            | Condition | Mean  | Standard Deviation | Adjusted Group Means |
|----------------------------------|-----------|-------|--------------------|----------------------|
| Total<br>N=73                    | Pre-test  | 43.27 | 3.66               |                      |
|                                  | Post-test | 43.88 | 3.66               |                      |
| Experimental<br>Group I<br>N=26  | Pre-test  | 43.04 | 4.39               | 44.26                |
|                                  | Post-test | 44.19 | 3.56               |                      |
| Experimental<br>Group II<br>N=23 | Pre-test  | 43.78 | 3.03               | 43.85                |
|                                  | Post-test | 44.00 | 2.92               |                      |
| Control<br>Group<br>N=24         | Pre-test  | 43.04 | 3.45               | 43.48                |
|                                  | Post-test | 43.42 | 4.43               |                      |

APPENDIX XV

MEANS AND STANDARD DEVIATION

TEST FACTOR Z

| Group                            | Condition | Mean  | Standard Deviation | Adjusted Group Means |
|----------------------------------|-----------|-------|--------------------|----------------------|
| Total<br>N=73                    | Pre-test  | 41.59 | 4.64               |                      |
|                                  | Post-test | 41.30 | 3.60               |                      |
| Experimental<br>Group I<br>N=26  | Pre-test  | 41.50 | 3.85               | 40.37                |
|                                  | Post-test | 40.35 | 3.68               |                      |
| Experimental<br>Group II<br>N=23 | Pre-test  | 41.35 | 4.81               | 41.11                |
|                                  | Post-test | 41.04 | 3.56               |                      |
| Control<br>Group<br>N=24         | Pre-test  | 41.92 | 5.39               | 42.49                |
|                                  | Post-test | 42.58 | 3.30               |                      |

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