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GRADUATE COLLEGE

AN INVESTIGATION INTO A METHOD FOR DIFFERENTIATION BETWEEN GROUPS WITH OPPOSING ATTITUDES: PRO-ENVIRONMENT VERSUS ANTI-ENVIRONMENT

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

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BY

GEORGE B. CARROLL, JR.

Oklahoma City, Oklahoma

1973

AN INVESTIGATION INTO A METHOD FOR DIFFERENTIATION BETWEEN GROUPS WITH OPPOSING ATTITUDES: PRO-ENVIRONMENT VERSUS ANTI-ENVIRONMENT

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DEDICATION

This work is dedicated to

Lt. Col. and Mrs. G. B. Carroll, Sr.

my parents

and

Theresa Treadway Carroll

my wife

for having given me their unqualified

love, support, encouragement and understanding.

TABLE OF CONTENTS

Page

LIST OF TABLES v

LIST OF ILLUSTRATIONS vi

Chapter

I. INTRODUCTION 1

II. LITERATURE REVIEW 6

III. PURPOSE AND SCOPE 21

IV. MATERIALS AND METHODS 23

V. OBSERVATIONS AND DISCUSSION 29

VI. SUMMARY AND CONCLUSIONS 44

LITERATURE CITED 50

APPENDICES

Appendix A 53
Appendix B 58
Appendix C 62
Appendix D 66
Appendix E 69
Appendix F 73

LIST OF TABLES

Table		Page
1.	Percentage of Anchor and Displaceable Statement Placed into Each of Eleven Categories by Pro-Environment and Anti-Environment Subjects	30
2.	Wilcoxon T and Level of Significance for a One-Tailed Test for Sets of Categories Compared for Pro-Environmental Subjects	34
3.	Wilcoxon T and Level of Significance for a One-Tailed Test for Sets of Categories Compared for Anti-Environmental Subjects	35
4.	Mean Responses by Groups, Mann-Whitney U, and Levels of Significance for a One-Tailed Test for Each of Eleven Categories	37
5.	Percentage Distribution of Environmental Attitude Scale Scores by Annual Income Levels	70
6.	Percentage Distribution of Environmental Attitude Scale Scores by Education Level	70
7.	Percentage Distribution of Environmental Attitude Scale Scores by University Area of Concentration	71
8.	Percentage Distribution of Environmental Attitude Scale Scores by Political Preference	71
9.	Percentage Distribution of Environmental Attitude Scale Scores by Community Type	72

LIST OF ILLUSTRATIONS

Figure — Page

1. Percentage of Statements (30) in Each Category for Pro-Environment and Anti-Environment Subjects 31

2. Percentage of Statements (20) in Each Category for Pro-Environment and Anti-Environment Subjects 32

AN INVESTIGATION INTO A METHOD FOR DIFFERENTIATION BETWEEN GROUPS WITH OPPOSING ATTITUDES: PRO-ENVIRONMENT VERSUS ANTI-ENVIRONMENT

CHAPTER I

INTRODUCTION

The population of the world is presently estimated at 3.5 billion inhabitants. More than two-thirds of these are undernourished. "By the year 2000, this population may be double what it is at present, vastly outstripping the earth's ability to produce enough food to feed these people" (1). "Overpopulation as an environmental crisis has been augmented by urbanization and technical advance" (2). Urbanization has exaggerated the problems of an already overpopulated world, and advances in technology have increased the magnitude and complexities of man-made pollution.

"Historically, humans have thoughtlessly exploited the earth" (3). Man was merely another animal whose pollution was easily assimilated into the environment. Now, however, the human population has increased to such a level, and the resulting pollution so diverse and pervasive, that the systems of nature are unable to absorb the quantities generated. According to Stead (4), the time is rapidly approaching when a use-resource ratio of 1:1 will exist. At this point in time it

will no longer be ecologically possible to release waste in any form into the atmosphere or water supplies. Clearly the problem of environmental pollution cannot be solved by applying specific solutions to particular problems. The answer must be found in a comprehensive analysis of the total environment.

The diverse problems associated with environmental pollution are impervious to the uni-dimensional approach of technology and science. The elimination of environmental pollution must also involve questions of law, sociology, politics, and economics, among others. Indeed, "environmental problems today may offer a greater challenge to contemporary social and political systems than to technological capabilities" (5). President Nixon has recognized this possibility and has commented on it in his "Message on Environment" (6). President Nixon called for "fundamentally new philosophies of land, air, and water use, for stricter regulation, for expanded government action, for greater citizen involvement, and for new programs to insure that government, industry, and individuals all are called on to do their share of the job and pay their share of the cost." The effort to save the environment will necessitate a revolution in values, outlook, and economic organization.

The attitudes of each individual are crucial if society is to meet the problems of pollution successfully. Each individual must realize his personal responsibility to the environment, and must become ecologically responsible. This ecological awareness and the ensuing responsibility of the individual take various forms. Voting for a necessary sewage treatment bond issue, for example, or lobbying for environmental causes are important individual contributions in the area

of environmental concern. Individuals must be concerned and aware of environmental problems in order to act individually or collectively to eliminate environmental abuse. In the absence of proper attitudes, public and private environmental protection programs will probably fail (7). The best proposed environmental programs cannot succeed in the face of public apathy. Therefore, massive involvement on the part of the public is necessary to create and sustain viable programs of environmental protection.

The Task Force on Environmental Health and Related Problems has explicitly acknowledged that the involvement of the individual is as important as science and technology in dealing with environmental problems (8). In a report entitled "A Strategy for a Livable Environment", the Task Force suggests the creation of six new functional departments within the Department of Health, Education, and Welfare to deal with different aspects of the problem. Education and the creation of public awareness is the specific duty of one of these departments:

> . . . the Task Force recommended establishment . . . of an integrated effort for health education and general education to create a public understanding of its environment and an increased awareness of the individual and social responsibility in reference to it (8).

This report strongly supports education as the key to public awareness. "Awareness implies attitude change, and it is reasoned that attitude change ultimately results in political decisions imposing ordered social change" (9). Individual attitudes are directly related to individual action, and it is this individual action which must bear the primary role in future environmental protection. Education would seem the most practical means of attaining the attitude changes necessary

to support effective action in future environmental programs.

In recent years various individuals and groups have approached the issue of increasing public environmental awareness via education. Much of this educational material has followed the format of simply presenting facts, speculation, and projections about various forms of environmental pollution and abuse. Other attempts at public education, however, such as the Sierra Club's Ecotactics, have emphasized methods of dramatizing current pollution problems. This latter form of educational approach has concentrated on the development of effective educational methods aimed at creating public environmental awareness, and emphasizes areas in which changes in attitudes are particularly important as a first step in environmental protection (5).

Attitudes such as the "frontier ethic", which allow man to think of himself as an unbridled conqueror of the earth's resources, cannot co-exist with the requirements of today's environmental concerns. Attitudes such as these can no longer be tolerated in light of their consequences. It is, therefore, necessary for man to change the concept of his role toward natural resources from conqueror to steward. This attitude on the part of the public is essential to the implementation of effective programs of environmental protection.

Overpopulation is another area in which public attitude changes are necessary as a prerequisite to effective control of the problem, and consequent protection of the environment. The benefits of the available technology concerning birth control are negligible if the attitudes of those who should make use of them are not positive.

The general public, however, is not alone in its need of

attitude change with respect to environmental protection. A need for change also exists among the attitudes of many technical experts in related fields. Linton (10) demonstrated this interesting observation in his article concerning environmental views of public health officials. He found that public health officials tend to believe that environmental health is solely a technical problem to be solved on a local level. From the perspective of today's widespread environmental health problems, these attitudes are obviously erroneous and intolerable. Environmental problems do not respect local boundaries. Decisions concerning environmental health must often be made in a larger political arena. For this reason Linton calls for:

> . . . a new attitude toward restoring the environment, one in which the illusions of parochialism are stripped away. There is no room for technical parochialism, for jurisdictional parochialism, or for functional parochialism in meeting the present and future challenges of environmental protection. It is this kind of narrow view that has brought us face to face with worsening pollution problems in our air and water and on our land (10).

While it is obvious that changes in attitudes are necessary with respect to all areas of the environment, it is equally obvious that an attitude cannot be changed through an educational process unless the attitude can be identified and its strength quantified. Therefore, the central purpose of the present investigation shall be to develop a method for accurately assessing attitudes toward the environment.

CHAPTER II

LITERATURE REVIEW

A thorough search of the literature revealed only a limited number of systematic studies on attitudes toward the environment, none of which report actual attitude assessment. This observation is not surprising since environmental problems and subsequent concern over environmental "awareness" have only recently been the object of public concern. Studies which have been completed are concerned primarily with the magnitude of specific environmental problems and methods to alleviate such problems.

DeGroot (9), in a survey of six different studies on attitudes toward air pollution, found definite trends in attitudes among the surveys even though methods were not exactly comparable. All the studies dealt with the public's concern for air pollution and with what actions should be taken to alleviate air pollution problems. He found in all studies that awareness of air pollution was directly related to the amount of suspended particulate matter in the atmosphere of a neighborhood. However, residents also always rated the neighborhood's air problems below those of the rest of the community. The general consensus seemed to be that air pollution was relatively less important than unemployment and juvenile delinquency. The main reason for concern

about air pollution was health. The surveys revealed that the public felt the federal government should take the lead in controlling air pollution. Individuals felt that they had little power to bring about actions to control pollution.

DeGroot (11), in another study of attitudes on air pollution in Buffalo, New York, examined questions relative to level of awareness of pollution. Two different surveys were taken of the same sample in 1959 and 1962, the first by face to face interviewing and the second by telephone. When questioned whether air pollution was a serious problem, 43.6 per cent in 1959 and 45.5 per cent in 1962 answered in the affirmative. Air pollution was rated as approximately as serious as alcoholism. Perception of pollution as a problem was found to increase according to pollutant level in the neighborhood and the prevalence of respiratory disease. Individuals surveyed believed that air pollution was first most detrimental to human health and secondly to property value. Subjects felt that industry contributed most heavily to air pollution.

Rankin (7), in a 1966 study of attitudes toward air pollution in Charleston, West Virginia, and three smaller communities in the Kanawha Valley, concentrated on determining attitudes related to what could be accomplished to control air pollution rather than trying to assess perception of the problem. In general, when questioned on the subject, people felt that pollution could be reduced, and they felt that such a reduction would be beneficial. Subjects could not foresee detrimental effects from a reduction in air pollution, and they reported that they would be willing to pay an increase in taxes. When questioned as to whether or not they would be in favor of air pollution control if it

resulted in a reduction in employment, the majority of those surveyed would still favor such programs. However, resistance to this question was greater than to other questions. While being in favor of clean air, subjects surveyed were undecided as to what would result from control programs. Over 50 per cent questioned believed that air quality in their neighborhood would be unaffected by control programs. Sixty-six per cent were unaware of existing control efforts.

Surveys on attitudes toward air pollution generally reveal that people are aware of the problem, but feel that they have no means to act for change.

Shiffman (12) studied the attitudes of administrators of environmental control programs dealing with environmental pollution control standards. He sought to identify attitudes in order to help explain decision making. It was found that administrators see standards as an aid in the day to day actions rather than as an aid to long term planning. Administrators were sensitive to shortcomings of standards but favored officially adopted standards instead of guidelines. Most believed that some interpretation of standards was needed. Federal government standards were felt to be the most desirable.

A review of literature concerning attitudes towards environmental problems reveals no systematic approach to their assessment. Only surveys concerning specific environmental problems or public opinion polls have dealt with, or attempted to deal with attitude assessment. Since attitudes are a vital element in receptiveness to change and predisposition in action, it is important that an instrument be developed to determine attitudes concerning environmental problems.

Attitude Assessment and Instrumentation

Attitude measurement has been particularly hard for investigators because of the difficulty in developing instruments that would accurately measure attitudes held by individuals or group members.

In order to clarify the relationship between attitudes and issues, Sherif and Sherif (13) have offered the following propositions:

a. Attitudes are not innate. They are formed or learned in relation to given objects, persons, groups, and events. This criterion differentiates attitudes from biogenic motives.

b. Attitudes are more or less lasting. This criterion literally means more lasting or less lasting. The implication is that, since they are learned, they are not immutable.

c. Attitudes always imply a subject-object-relationship . . . . They are formed or learned in relation to an identifiable referent, be it a person, a group, an object, an institution, an issue, or an event.

d. The referent of an attitude may encompass a small or large number of items . . . . This implies the process of generalization, which is the essential process of concept formation.

e. Attitudes have motivational-affective properties. This criterion differentiates an attitude from other learned items in the psychological make-up of the individual.

Attitudes form in relation to persons, situations, or groups with which the individual comes in contact during social living. This contact provides a basis for attitude formation, and it later provides the individual with characteristic patterns of behavior. Attitudes may cause selectivity and distortion in perceiving situations and they appear to structure or define an individual's position on issues.

The following discussion is an attempt to clarify the major advantages and disadvantages of the various instruments reported

in the literature. Campell (14) categorizes these instruments into disguised-nonstructured, nondisguised-nonstructured, nondisguised-structured, and disguised-structured. His format will be used for the discussion to follow.

Disguised-nonstructured

Projective techniques which have been modified for attitude study are characteristic of this type of instrumentation. The object is to conceal the purpose of the investigator from the subject while allowing interaction with the stimulus to occur in the most fluid way possible.

One of the widely used projective tests adapted for measurement of attitudes is the Thematic Apperception Test. Subjects are required to tell stories about a series of stimulus-pictures. The subject's stories are subjected to a content analysis revealing specific themes which can be evaluated in terms of attitudes. An objective scoring system has also been devised for the content evaluation. Newcomb and Hartley (15) have summarized the basic implications of the TAT for attitude measurement. The advantage of the instrument is that it yields a wide range of data and is an indirect attitude measure. Its disadvantages are subjective scoring, examiner bias, and a time problem.

Primary advantages of the disguised-nonstructured techniques are: there seems to be a real advantage in concealing the purpose of the experiment from the subject; and a rating technique or quantification method has merit for objectifying the process of attitude measurement (as opposed to the content analysis approach).

Primary disadvantages are: the general lack of an objective method of analyzing the data; the wide variety of responses obtained in the nonstructured situation, which makes selectivity and analysis difficult; and this approach is usually very time consuming.

Nondisguised-nonstructured

Instruments included in this category are those of free-interviewing or association, open-ended questioning, or questions requiring essay type answers. Primary usage of this type of instrument has been the study of individuals and groups in social interaction. In contrast with the disguised-nonstructured approach, this technique does not require concealing the fact that attitudes are being measured.

Bales (16) categorized social interaction in small group situations by devising a method to tabulate behavior directly. An observer tallied the subject's behavior as it occurred, using 12 categories which described various types of response possibilities. The objects was to compile a complete record of the interplay of thought and emotion. The major advantage of this technique is its quantification aspect. Major disadvantages include the problem of whether or not the 12 categories are inclusive of all significant behavior patterns and the problem of tabulator reliability.

Some of the advantages of the nondisguised-nonstructured instruments are: many necessitate short administering and scoring times; a wide variety of data emerges for other studies due to their nonstructured style. Some disadvantages are: there is no objective method of analyzing the data due to the wide range of responses of the subject; it is difficult to control for observer bias; reliability is question-

able due to situational factors influenced by the direct approach; it is difficult to establish behavioral categories during the rating process; and there is a problem of controlling intervening variables, such as other attitudes, during the measurement process.

Nondisguised-structured

These instruments consist of the point-blank questions of public opinion polling and the direct rating scales in common use for attitude assessment. The basic technique is characterized by directness of measurement and emphasis on quantification methods in an objective way.

Another well-known and used instrument for measuring attitudes toward many issues is the Likert (17) scale, particularly the original Negro scale. The scale consists of statements concerning desirable or undesirable behavior toward Negroes. Subjects were required to choose one of the following alternative responses for each statement: strongly approve; approve; undecided; disapprove; and strongly disapprove. Each alternative response has an assigned numerical value for scaling purposes. The direction and intensity of the stand taken by the subject is indicated by his total score. Scalability was found to be a major problem in the Likert scale because the validity of the test rests upon the dubious assumption that the test embodies equal intervals. Another problem is subject contamination, due to the directness of the instrument and the resulting awareness of the subject.

Thurstone and Chave (18) developed scales consisting of lists of statements ranging from favorable stands on an issue to unfavorable stands. The statements were given to subjects on a printed form. The subject's task was to check the statement or statements with which he

agreed. Each item is attributed a scale value, which makes possible the measurement of the subject's attitude on an issue by averaging scale values for those statements checked.

Scale construction is elaborate and involved. Thurstone and Chave (18) began by collecting 130 statements about the church which covered a wide range of pro and anti positions on issues regarding the church. They had 341 judges sort each statement on an 11-point scale, which in turn ranged from high appreciation for the church to strong depreciation of the church. Items were eliminated on the basis of "inconsistency", and the responses of some judges were eliminated on the basis of "carelessness" if they placed more than 30 statements in any one or more of the eleven categories. These sortings were tabulated in the form of cumulative frequencies. The scale value of a statement was determined by locating the midpoint of the cumulative frequency distribution.

The basic assumption underlying the construction technique is that judges have the ability to sort a large number of statements into equal-appearing intervals or categories regardless of their stands on the issue. Hinkley (19) designed an experiment to test this assumption by using 114 statements from unfavorable to favorable stands on the social position of Negroes. He found a high degree of agreement between the scale values of statements based upon the judgment of all groups. However, following the example of Thurstone and Chave (18), he eliminated judges who placed 30 or more statements in any one pile or category due to "carelessness". He stated:

> One tendency which revealed itself in the sorting of the statements by the subjects was the bunching of statements in one or

> more piles to the apparent detriment of other piles. This phenomenon of bunching at the extremes was noticed in the cases of certain of the white subjects, but was especially noticeable in the Negro subjects (19).

The lumping of statements was later found to be a function of subjects holding extreme positions, and will be discussed in the next section.

Advantages of this instrument are that it can be used to measure a wide variety of attitude issues, it is easily quantifiable, and it yields an objectively quantifiable measure of the subject's attitude toward an issue. Disadvantages are similar in kind to those of the Likert technique: scalability, subject contamination, and elimination of subjects placing 30 or more statements in any one category.

Taken as a whole, the major advantages of the nondisguised-structured instrumentation approach appear to be as follows: the procedures are objectively quantifiable; they can be adapted to a wide variety of issues; administration is simple and quick; attitudes can be measured along varying dimensions of meaning; and intercorrelations of attitudes toward various issues can be assessed.

Some of the disadvantages are the following: directness of approach may contaminate the subject's responses; there are problems with scalability, such as statement consistency, socre summation, and weighting of responses; test construction eliminates many statements in one category; there is lack of information about how subjects judge various positions about the issue; there are problems with item validity and test validity; and some instruments have a problem of intervening variables not being accounted for in the scoring process, thus making the attitude position unclear.

Disguised-structured

This approach emphasizes that the subject has no knowledge that his attitudes are being measured. These instruments are presented to the subject merely as tasks to be performed. The disguised-structured techniques are based on many of the methods employed in the undisguised-structured technique. Further, this approach yields an objective measure of attitudes. Usually, the subjects are asked to serve as judges for purposes of selecting statements that seem to have merit for describing an issue.

A promising work in this area of attitude measurement is Sherif and Hoveland's (20) work in which they used the 114 statements of Hinkley (19). Groups of subjects were asked to sort the statements under two conditions: a) sorting the statements into a structured or imposed 11 categories or rating scale system, and b) sorting the statements into as many categories as the subject chose. These were called, respectively, "imposed categories" and "own categories". The specific hypotheses for these studies included:

a. Judges with extremely pro or con attitudes will show a tendency to concentrate their placement of items into a small number of categories.

b. Judges with an extreme position and strong personal involvement will be highly discriminating in accepting items at their own end of the scale. They will correspondingly display a strong tendency to lump together statements at the end of the scale which they reject. The former tendency can be described as a raised threshold of acceptance and the latter as a lowered threshold of rejection.

c. A greater degree of displacement will occur for the "neutral" items and a smaller degree for the sharply defined pro and con statements at the extremes.

> In less technical terminology these hypotheses state that individuals with strong personal involvement will tend to see issues pretty much in "black and white" rather than with fine distinctions, and that statements even mildly critical of their position will be judged more hostile by them than by more neutral individuals (21).

The results of the Hovland and Sherif (21) and Sherif and Hovland (22) studies essentially agreed with their expectations. To complete the theoretical background for this study, brief mention must also be made of other important issues related to the measuring of attitudes with the disguised-structured instrumentation.

Categorization patterns. This area refers to the number of categories used in judging a series of statements describing a given issue. Sherif, Sherif, and Nebergall (23) have delineated varying usage of categories as follows:

> If the individual has committed himself to a stand, the upshot is that his categories, hence the judgment scale, when he judges a series of relevant objects exhibit noteworthy differences from those he uses for a series of motivationally neutral objects. Motivationally neutral series are exemplified by weights, lengths, visual inclinations, or intensities in some sense modality, in which there are graduations among members of the stimulus set in question. Judgment here consists of comparing the discriminable differences between stimulus members on the dimension being judged. As far as the individual judge is concerned, the series is neutral.
>
> In contrast, when a highly religious person or a highly antireligious person judges a stimulus statement on religion, singly or in a series of statements, these items are not neutral. When an individual has thus differentiated a universe of discourse, he consciously or unconsciously judges positions concerning it through comparison of their relative proximity to a distance from those he upholds as his own.
>
> Proportional to his personal involvement in the issue and to the extent that stimulus arrangements allow alternative placements of the items, his judgments are affected by his own stand on the issue.

The hypothesis that highly involved subjects with extreme

stands on an issue use fewer categories in the judgment process has been confirmed in studies by Vaughan (24), Parrish (25), Nevin (26), and Fisher (27). These studies also confirmed that the more highly involved a subject is in his position or stand, the greater the probability that his mode of judgment will be at the position most objectionable to him. Less involved subjects will use more categories and their judgments will be more evenly distributed.

Ego-involvement. This refers to the degree to which an individual commits himself to a stand or position on a given issue. Sherif, Sherif, and Nebergall (23) define ego-involvement as follows:

> . . . the arousal, single or in combination of the individual's commitments or stands in the context of appropriate situations, be they interpersonal relations or a judgment task in actual life or an experiment.

Briefly, when a subject is highly ego-involved with an issue, his stand becomes an anchor for his judgments.

Assimilation and contrast effects. This phenomenon refers to variations or differences that occur in the social judgment process as a result of differences and similarities between anchors and items, according to Sherif, Sherif, and Nebergall (28). As the differences between anchors and the stimulus situation or items increases, contrast effects (displacement away from the anchor) are also increased. But if there are few differences, or the anchors and items are more similar, assimilation (displacement toward the anchor) will occur. Placement of items will tend to be accurate if an anchor and the stimulus situation or items are alike. Subjects with high ego-involvement tend to judge items based on their own evaluative categories (anchors). This produces contrast and assimilation effects which are a function of

differences and similarities between anchors and items.

The same authors summarize their findings about the anchoring effects of a person's own stand in the social judgment process as follows:

a. Like the moderate judge, he accurately and consistently places the strongly worded, unequivocal statements of extreme positions in the extreme categories. Variability in placement of such items is consistently and uniformly low . . . .

b. Unlike the moderate judge, who tends to use all 11 categories with fair equality, the extreme judge neglects the intermediate categories. As a result, the distribution of his judgments is bimodal: the judgments are concentrated in the extreme categories opposite to his own stand and in the extreme categories with which he agrees . . . .

c. The greater frequency of judgments in categories most acceptable to the extreme judge results from assimilation of items near his own stand. These are extreme items but not the most extreme . . . . As a consequence of this assimilative trend, the average placements of all items near the extreme he accepts (average scale values) are more extreme than the average placements of the same items by moderate judges . . . .

d. The greater frequency of judgments in categories at the opposite extreme from the subject's own stand reflects a contrast effect. Differences between his stand and the items near the opposite end are emphasized. As a consequence, the average placement of all items at the opposite segment is more extreme than that by moderate judges.

e. Intermediate items in such pools of statements typically show most variation in placement . . . for a variety of reasons away from his own stand because, ordinarily, his latitude of . . . (23).

They also conclude that the variables contributing most to assimilation and contrast effects are the following: the subject's stand in terms of a reference scale; his degree of ego-involvement, reference group membership; the properties of the items; the arrangements of

stimuli and procedures; place, time, and sequence; and sources of communication.

Latitudes of acceptance, rejection, and noncommitment. Sherif, Sherif, and Nebergall (23) have defined each of these concepts as follows:

> Latitude of acceptance is the position on an issue (or toward an object) that is most acceptable, plus other acceptable positions.
>
> Latitude of rejection is the most objectionable position on an issue, plus other objectionable positions.
>
> . . . latitude of noncommitment, defined as those positions not categorized as either acceptable or objectionable to some degree.

Some of the advantages of the disguised-structured instrument appear to be the following: since subjects are unaware of the experimental purpose they are permitted to make their own judgments based on their attitudes, instead of perceived expectations of the testing situation; the subject's stand yields a quantifiable measure; subject's ego-involvement on an issue can be measured in terms of the direction of their positions; the own-category method allows the subject to use his own categorizing techniques; and subjects' latitudes of acceptance, rejection, and noncommitment can be calculated.

Some of the disadvantages of the disguised-structured instrument appear to be as follows: the difficulty of differentiating between individuals with similar extreme stands or to identify individuals who may be strongly committed to a moderate stand on an issue; it is difficult to differentiate between subjects holding identical attitudes but with varying meanings attached to the concepts; subjects tend to judge items on a true-false dimension rather than the unfavorable-favorable

dimension.

The theoretical justification for the present investigation rests on two major assumptions. First, that attitudes toward such a diversified and complex problem as the environmental crisis may be studied by way of attitude scaling. Second, that such a study is meaningful in that one's attitude toward environmental problems has a direct bearing on solving (or compounding) environmental problems.

In the chapters to follow, an attempt will be made to develop an attitude scale which will assess one's attitudes toward environmental problems. A disguised-structured instrument will be constructed and validated by a Likert type internal consistency scale. Since this test is more sensitive than a mere "paper-and-pencil" personality test, it is hoped that it will reveal differences the latter could not.

CHAPTER III

PURPOSE AND SCOPE

A review of the literature indicates environmental attitude assessment has received only token concern and a minimum of effort. Attitudes are difficult to define and to measure, but are a vital element in receptiveness to change and predisposition to action. An attempt to make environmental attitudes discernible as well as quantifiable as to the strength of these attitudes is a necessity for the direction of environmental action oriented programs.

The primary purpose of this study was to investigate the possibility of developing a method for the assessment of attitudes toward environmental problems. A disguised-structured type of instrumentation was selected to be tested in the study. The instrument consists of statements to be responded to by assigning values to each statement by the subjects. The statements contain items relating to many views pertaining to the present "environmental crisis". An attempt was made to develop statements which fit the criteria of the disguised-structured instrument: to have a range from unfavorable to favorable and to contain displacable, ambiguous, neutral, and anchoring type characteristics.

Since this type of instrument was previously developed under

more controlled conditions, a secondary purpose of the study was to determine if such instrumentation could be obtained by the questionnaire technique. More specifically, to determine if both qualitative and quantitative data for assessing attitudes, in this case attitudes toward environmental problems, can be obtained by the questionnaire technique.

The general hypotheses to be tested, then, are as follows:

Hypothesis I - Subjects with similar attitudes on the environmental crisis will place more displacable statements into categories exactly opposite their own position than in categories at their own end of the scale.

Hypothesis II - On the same attitude continuum, subjects with opposing attitudes on the environmental crisis will differ characteristically in that they will place more statements in those categories which oppose their own stand on the environmental crisis.

If the scale meets the criterion for a disguised-structured instrument a final phase of scale validation will be carried out by way of the Lickert Internal Consistence technique. Aside from validating the scale, there was an equally important reason for using this method. Since the items were weighted, in that they were selected on the basis of how they relate to the total scale, it was possible to assign respondents a scale score on a weighted score basis. This, of course, yield valid ordinal measure, which was the final goal of this investigation.

Assuming that the scale construction will be successful, the scale will be tested as a dependent variable in an attempt to isolate some of the more common social factors which may or may not be associated with environmental attitudes. Since this phase of the study is not of primary focus, any findings will be offered only on a pilot basis.

CHAPTER IV

MATERIALS AND METHODS

Pre-Test

The materials collected for the development of a disguised-structured instrument to assess attitudes toward the environment were drawn from such sources as books, magazines, journals, newspapers, and conversations. The statements were similar in construction to those of the poor, city, Negro, and Latin-American scales, but with the content focused on aspects concerning the environment. The intent was to collect statements that appeared to describe many different aspects of the present environmental crisis. See Appendix A for a complete list of the 62 statements collected for the pre-test used in the development of the instrument.

A total of 62 statements were pre-tested for the purpose of selecting the items which appeared to have the greatest discriminating value for assessing attitudes toward the environment. The pre-test was used to determine those statements which exhibited the greatest anchoring and displacement characteristics. Subjects for the pre-test were students from many different disciplines representing a full range of views toward environmental problems. A total of 117 students were selected to participate in the pre-test and 77 questionnaires were returned

completed, accounting for 65.8 per cent.

The subjects participating in the pre-test were mailed the instrument consisting of 62 items, randomly ordered, listed on five sheets. Directions, response sheets, and personal data sheets, constructed in the same manner as the statement item's sheets, were provided also and brought the total number of sheets mailed to each pre-test subject to nine. Statements were to be responded to by using the "imposed categories" procedure. The imposed categories procedure provided for the subjects a range of choices from 1 to 11 for purposes of identifying their positions on the issue described in each item. The format for the response sheets was as follows:

Circle the # indicating your selection

	Unfavorable										Favorable
1.	1	2	3	4	5	6	7	8	9	10	11
2.	1	2	3	4	5	6	7	8	9	10	11
3.	1	2	3	4	5	6	7	8	9	10	11
.											
.											
.											
62.	1	2	3	4	5	6	7	8	9	10	11

Directions were enclosed with each packet mailed to the pre-test subjects.

Responses by the pre-test subjects were tabulated for each of the 62 statements. In order to ascertain which statements exhibit ambiguous, neutral, anchoring, or displaceable type characteristics, a frequency distribution was tabulated and statements were evaluated by placing them into one of five categories: (a) consistently placed in categories 1, 2, and 3 (unfavorable end); (b) consistently placed in

categories 9, 10, and 11 (favorable end); (c) displacement toward the unfavorable and (category 1); (d) displacement toward the favorable end (category 11); (e) displacement in both directions (categories 1 and 11). Statements which were consistently placed in category 6 were considered neutral and of no value in measuring attitudes. Items, excluding anchors, that were not subjected to a large amount of displacement were discarded as they appeared to have little discriminating value.

Statement Selection for the Experimental Scale

Thirty statements were selected and used for the experimental scale. Included in these were items which were found to be consistently placed in extreme categories (categories 1 and 11). Statements placed in these extreme categories were selected for their anchorage characteristics, that is, they were judged by a vast majority of the pre-test subjects in the same manner. A second group of statements selected were those items that had high displacement characteristics as indicated by the judgment patterns of the pre-test subjects, that is, if they were subject to wide displacement through the range of categories. In all, the experimental scale included 30 statements, as follows:

a. five statements with anchorage characteristics of category 1 (unfavorable),

b. five statements with anchorage characteristics of category 11 (favorable), and

c. 20 statements with displaceable type characteristics through the range of categories.

See Appendix B for these 30 items with their name.

Experimental Questionnaire Materials Preparation

The 30-statement experimental scale was placed on three sheets of standard typing paper. Directions, personal data, and response sheets were also provided on the same paper, along with self-addressed, stamped return envelopes.

Selection of Test Subjects

Selection of test subjects was on the basis of "known group" criteria. Two groups were selected which represented opposite attitudes on special interests in relation to environmental problems. This selection process rendered it possible to determine if the items were capable of discriminating between subjects who appeared likely to have pro-environmental attitudes as opposed to those who appeared likely to have anti-environmental attitudes.

Thus, the determination of a subject's stand and identification of his special interest group affiliation became a critical variable in the compilation of two groups representing anti- and pro-environmental positions or stands. Due to the lack of instrumentation in this area it was determined that occupation and other corroborating information would have to serve as validating measures of a subject's stand.

a. A person whose profession is in one of the following occupational areas:

   1) public health
   2) environmental health
   3) occupational medicine
   4) health education (state government)
   5) sanitary engineering (state or local government)
   6) air pollution control
   7) industrial hygiene
   8) radiological health
   9) conservation

10) fisheries and wildlife
11) water resources
12) forestry

Or

b. A person who is active in one of the following types of organizations:

1) conservation groups
2) National Camper and Hikers Association
3) Coalition for Clean Air
4) population control

A group of persons with a pro-environmental stand as defined by the above criteria was located by obtaining lists of persons presently involved in environmental action programs and those who participated in the Oklahoma Governor's Environmental Quality Conference, September 24-25 in 1970. Those subjects selected from the Governor's Conference were so selected, in part, on the strength of their statements which were recorded in the conference proceedings and, in part, by occupation or affiliation with environmentally concerned organizations. A total of 50 pro-environment subjects were sent the mail-out experimental instrument. A total of 32 questionnaires were returned, for a 64 per cent return.

For the anti-environmental groups the following criteria were established for the selection of subjects:

a. A person whose occupation is ine one of the following areas:

1) industrial development
2) Chamber of Commerce
3) economic development
4) petroleum industry
5) urban and regional planning
6) public service or utility corporation
7) heavy industry (executive or plant engineer)
8) light industry (manager or director)
9) merchant (owner)

Or

b. A person who is active in one of the following types of organizations:

1) manufacturing association
2) auto dealers association
3) interstate oil compact commission
4) development association
5) petroleum council
6) oil and gas association
7) aerial applicators association

It was determined that field work in selecting individuals via the individual-subject interview method would not be used. An individual's selection as an anti-environmental subject would be established mainly by his occupation or special interest group affiliation. Lists of personnel employed by the Oklahoma Industrial Development and Park Commission, persons serving as directors or presidents of Chambers of Commerce, and individuals representing industry at the Oklahoma Governor's Environmental Quality Conference made up the "bulk" of subjects participating as anti-environmental subjects. These subjects varied in age, educational backgrounds, and occupational backgrounds. A total of 75 anti-environmental subjects were sent the mail-out experimental instrument. A total of 34 questionnaires were returned for a 45 per cent return.

CHAPTER V

OBSERVATIONS AND DISCUSSION

Responses of the subjects on the 30-statement, six-page questionnaire were tabulated for a frequency distribution. An examination of the response patterns of the two groups to the five statements that were inserted into the scale as unfavorable anchor items and the five statements that served as favorable anchors was necessary to validate these anchor statements as reliable reference-scale end points for both groups. Table 1 shows the percentages of statements placed into each of 11 categories by the pro-environmental and anti-environmental subjects for: (a) 20 displaceable statements; (b) five unfavorable anchors; (c) five favorable anchors, and (d) all 30 statements combined. Table 1 shows that the response patterns of the two groups to the anchor items are quite similar.

The percentage of all 30 statements placed into each of the 11 categories by anti- and pro-environmental subjects is shown in Figure 1. Figure 2 shows the percentage of the 20 displaceable statements placed into each of the 11 categories by anti-environmental and pro-environmental subjects.

The responses to the 20 displaceable items are used as a basis for the statistical tests of the hypotheses.

TABLE 1

PERCENTAGE OF ANCHOR AND DISPLACEABLE STATEMENTS PLACED INTO EACH OF ELEVEN CATEGORIES BY PRO-ENVIRONMENT AND ANTI-ENVIRONMENT SUBJECTS

Statement Groups	Subject Groups	Statement Placement Categories										
		1	2	3	4	5	6	7	8	9	10	11
Unfavorable Anchors (5)	Pro	30.08	26.82	23.57	8.94	8.94	1.60	0.00	0.00	0.00	0.00	0.00
	Anti	28.45	23.57	18.69	12.19	5.69	7.31	0.81	1.62	1.62	0.00	0.00
Favorable Anchors (5)	Pro	0.80	0.80	3.22	2.41	3.22	4.83	8.06	12.90	12.09	25.80	25.80
	Anti	0.00	0.00	1.61	2.41	4.03	0.80	5.64	16.12	19.35	28.22	21.77
Displaceable Items (20)	Pro	10.00	11.40	15.00	17.60	10.00	12.80	6.00	6.60	5.00	3.20	2.40
	Anti	6.20	4.40	7.40	4.20	5.20	6.80	9.00	13.30	19.00	13.60	11.80
All Items (30)	Pro	11.60	13.06	15.10	9.70	9.73	7.86	5.46	6.40	8.26	5.60	6.26
	Anti	8.31	6.86	7.65	5.41	4.88	6.72	6.99	12.13	16.35	14.64	10.68

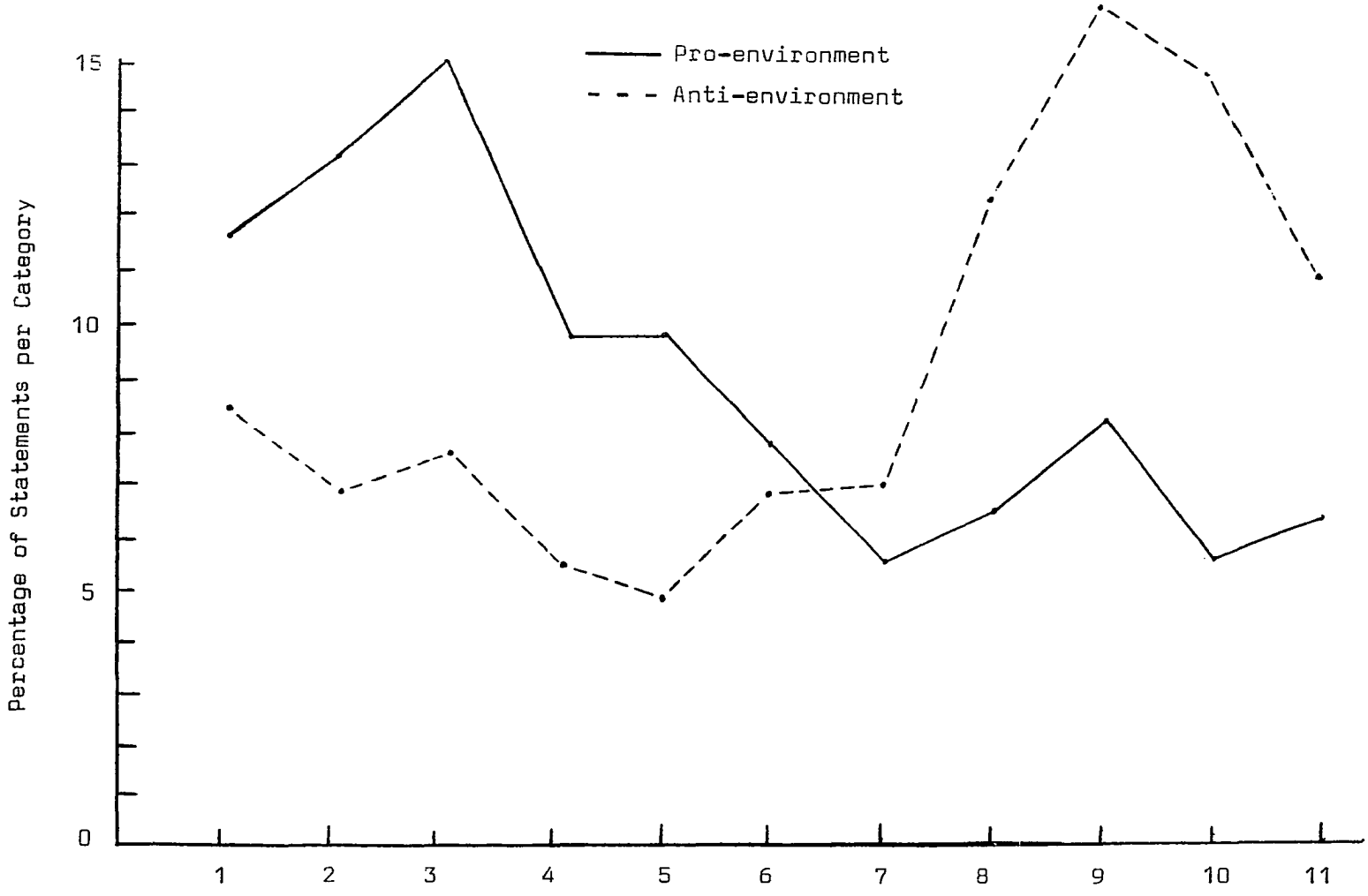

Figure 1.--Percentage of statements (30) in each category for pro-environment and anti-environment subjects.

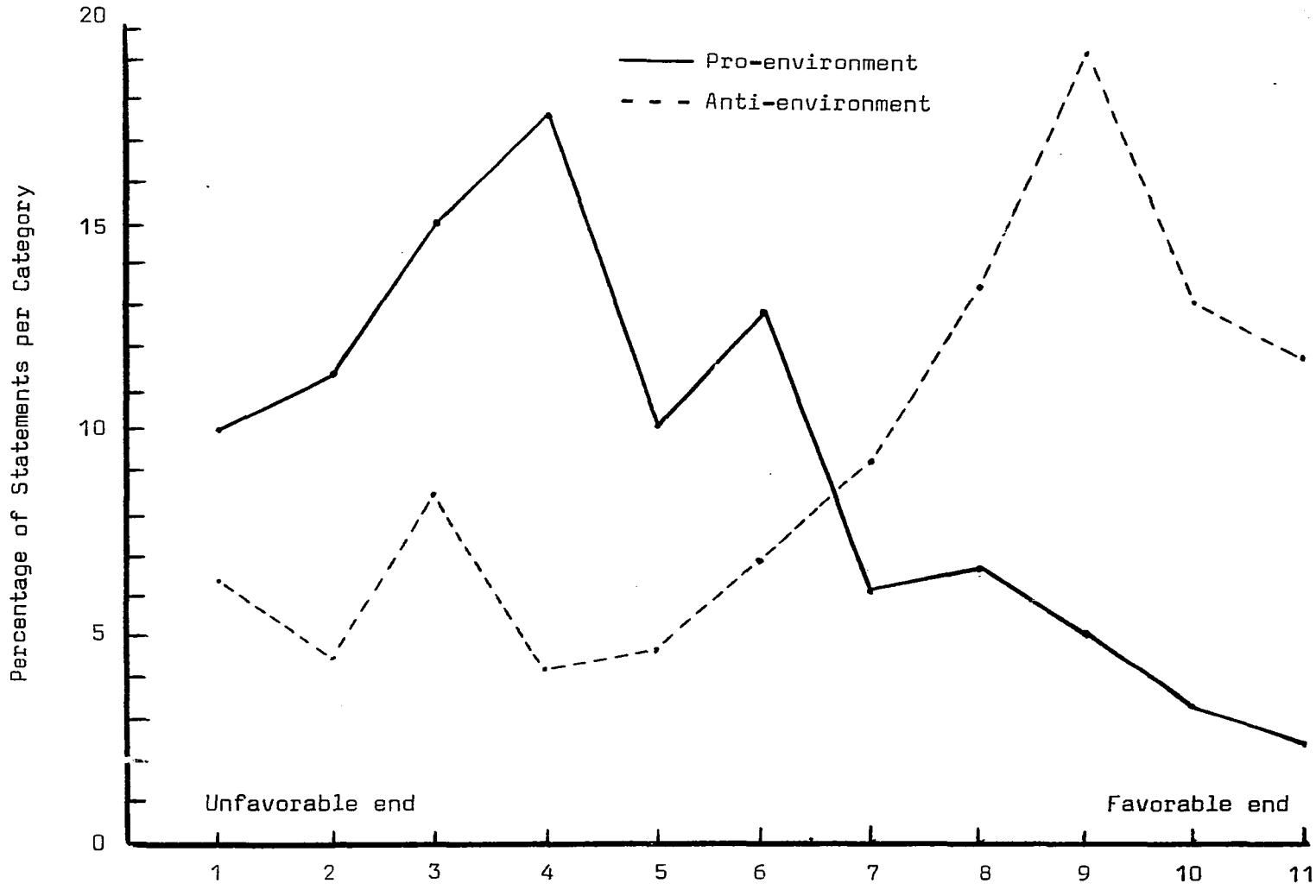

Figure 2.--Percentage of statements (20) in each category for pro-environment and anti-environment subjects.

Hypothesis I states that each criterion group will place more displaceable statements into the five categories at the end of the scale opposite their own position than into the five categories at their own end of the scale. Specifically, pro-environmental subjects will place more statements into categories 1 through 5 than in categories 7 through 11, and anti-environmental subjects will place more statements into categories 7 through 11 than in categories 1 through 5.

The test of Hypothesis I was accomplished with the use of the Wilcoxon Matched-Pairs Signed Ranks Test (28). This method was selected for these analyses because it utilizes not only information about the direction of difference, but also information about the relative magnitude of the differences.

> The Wilcoxon Matched-Pair Signed Ranks Test does just that: it gives more weight to a pair which shows a large difference between the two conditions than to a pair which shows a small difference (Siegel, 1956).

The number of responses in category 1 was compared with the number of responses in category 11 for each subject in the pro-environmental group. The sign differences between these responses for each subject were determined and ranked. The smaller sum of the like-signed ranks, T, was computed. The level of significance associated with each value of T was computed by converting each T value into a Z score.

This procedure was repeated for each of the two groups separately (pro-environmental and anti-environmental groups) with comparisons of the responses in each of the following sets of categories for subjects in each group: (a) category 1 with category 11; (b) categories 1-2 with categories 10-11; (c) categories 1-3 with categories 9-11; (d) categories 1-4 with categories 8-11, and (e) categories 1-5 with

categories 7-11.

The Wilcoxon T and levels of significance for a one-tailed test for each set of categories compared for pro-environmental subjects can be seen in Table 2. It can be noted from Table 2 that the unfavorable

TABLE 2

WILCOXON T AND LEVEL OF SIGNIFICANCE FOR A ONE-TAILED TEST FOR SETS OF CATEGORIES COMPARED FOR PRO-ENVIRONMENTAL SUBJECTS[a]

Categories	T[b]	Percentage	Percentage	p[c]
1 vs. 11	34.0	10.13	5.86	.0011
1-2 vs. 10-11	78.5	27.93	16.40	.0207
1-3 vs. 7-11	34.0	42.53	24.26	.0011
1-4 vs. 8-11	26.0	45.06	30.26	.0014
1-5 vs. 7-11	21.0	54.93	35.86	.0002

[a] N = 25
[b] Wilcoxon Matched-Pairs Signed Ranks Test (Siegel, 1956, pp. 75-83)
[c] Table of Probabilities Associated with values as extreme as observed values of Z in the normal distribution (Siegel, 1956, p. 247)

end of the scale (toward category 1) received more statement placements by pro-environmental subjects than the favorable end of the scale (toward category 11) at a level of significance of .001 for all comparisons with the exception of 1-2 vs.10-11 (.0207). These data lend strong support to Hypothesis I in that pro-environmental subjects placed a significantly larger number of statements into categories toward the end of the scale opposite their own view.

It can also be noted from Table 3 that the favorable end of the scale (toward category 11) received more statement placements by anti-environmental subjects than the unfavorable end of the scale (toward

TABLE 3

WILCOXON T AND LEVEL OF SIGNIFICANCE FOR A ONE-TAILED TEST FOR SETS OF CATEGORIES COMPARED FOR ANTI-ENVIRONMENTAL SUBJECTS[a]

Categories	T[b]	Percentage	Percentage	p[c]
1 vs. 11	59.0	8.26	7.86	.0735
1-2 vs. 10-11	28.0	15.33	22.13	.0011
1-3 vs. 9-11	42.0	23.06	38.80	.0007
1-4 vs. 8-11	22.5	28.40	50.93	.0001
1-5 vs. 7-11	31.5	33.60	58.00	.0002

[a] N = 25
[b] Wilcoxon Matched-Pairs Signed Ranks Test (28)
[c] Table of Probabilities associated with values as extreme as observed values of Z in the normal distribution (28)

category 1) at a level of significance of .001 in all but one of the five comparisons (i.e., 1 vs. 11, which was .0735). Therefore, these data also lend support to Hypothesis I, in that anti-environmental subjects placed a significantly large number of statements into categories toward the end of the scale opposite their own view.

Hypothesis II states that subjects in the two criterion groups (pro-environmental and anti-environmental) differ from each other in that pro-environmental subjects place more items into each of the first five (1-5) categories and fewer items into each of the last five (7-11) categories than do anti-environmental subjects. This hypothesis was tested by comparing the response patterns of each of the two groups of the 11 response categories.

Since only an ordinal scale was achieved through the use of 11 categories, it was decided to use the Mann-Whitney U Test (Siegel, 1956)

for the comparison of responses in each category by subjects in the two groups (pro- and anti-environmental groups). Regarding this test, Siegel states:

> When at least ordinal measurement has been achieved, the Mann-Whitney U Test may be used to test whether two independent groups have been drawn from the same population. This is one of the most powerful of the nonparametric tests, and it is a most useful alternative to the parametric test when the researcher wishes to avoid the test's assumptions, or when the measurement in the research is weaker than interval scaling (28).

A comparison was made between responses of pro-environmental subjects and anti-environmental subjects. The Mann-Whitney U was calculated for each category, comparing the number of items placed in that category by each pro-environmental subject with the number of items placed in the same category by each anti-environmental subject. These responses were ranked and the U-score derived by the formula:

$$U = n^1 n^2 + \frac{n^1 (n^1 + 1)}{2} - R_1$$

where R_1 = the total of ranks for responses in the group represented by n^1, level of significance for each U for a one-tailed test was found by converting the U value to a Z score and finding the P value of Z by reference to the Table of Probabilities associated with values as extreme as the observed values of Z in the normal distribution (28). Conversion of the U value to a Z value was performed by the following formula:

$$Z = \frac{U - pu}{6\ u} = \frac{U - \frac{n^1 n^2}{2}}{\frac{(n^1)(n^2)(n^1 + n^2 + 1)}{12}}$$

It was arbitrarily determined that the null hypothesis would be discarded

with confidence at the .05 level of significance.

Table 4 shows mean responses for each group, the Mann-Whitney U, and the level of significance for a one-tailed test for each of the 11 categories.

TABLE 4

MEAN RESPONSES BY GROUPS, MANN-WHITNEY U, AND LEVELS OF SIGNIFICANCE FOR A ONE-TAILED TEST FOR EACH OF ELEVEN CATEGORIES

Category	Mean Response		U^a	Z	p
	Pro-Envir.[c]	Anti-Envir.[d]			
1	1.56	1.24	440	2.47	.0068
2	3.08	0.84	466.5	2.99	.0014
3	2.92	1.48	422	2.15	.0158
4	2.12	0.84	417	4.33	.00003
5	2.00	1.04	437	2.40	.0082
6	2.56	1.36	440	2.51	.0060
7	1.20	1.80	354	0.80	.2119
8	1.32	2.77	492	3.48	.0003
9	1.84	3.77	449	2.65	.0040
10	1.08	2.72	495	2.80	.0026
11	0.68	2.44	522	2.11	.0174

[a]Mann-Whitney U Test
[b]Probability of making Type I error
[c]N = 25
[d]N = 25

Table 4 shows that pro-environmental subjects placed a larger number of statements into each of the five most unfavorable categories (1, 2, 3, 4, and 5) than did anti-environmental subjects at a .01 level of significance in each instance. Anti-environmental subjects placed a larger number of statements into each of the five most favorable

categories (7, 8, 9, 10, and 11) than did pro-environmental subjects at levels of significance of .2119, .0003, .0004, .0026, and .0174, respectively.

These data lend positive support to Hypothesis II, in that each group placed more statements into that end of the scale which was opposite to their own position.

Internal Consistency

With the two major hypotheses supported, confirming the disguised-structured instrument, the final scale validation was administered. This was accomplished by applying the Likert internal consistency technique to the scale items. This technique offers two distinct advantages. First, each item becomes a scale in itself, thus rendering the total scale as actually a battery of scales. Second, items are selected on the basis of how each relates to the score on the scale as a whole.

The internal consistency is represented by the "discriminative power" of an item (29). The discriminative power (DP) is determined in the following manner. First, the arbitrarily scored items are summed for each person. Those who fall above Q_1 and below Q_3 are then selected. The weighted total (score times the number checking that score) and weighted mean (weighted total divided by the number of cases of each item) are then computed. The discriminative power of each item may then be computed by subtracting the high weighted mean from the low weighted mean. See the chart that follows for an example of the computation process.

Group	No.	Item #6 Score 1 2 3 4 5	Weighted Total (Score x number checking that score)	Weighted Mean (Weighted total + number cases)	DP (High Weighted Mean - Low Weighted Mean)
High	12	1 1 0 4 6	49	4.1	2.0
Low	12	6 3 1 0 2	25	2.1	

The items are next arrayed in order according to their DP's from high to low assuring that a wide range in each type of weak and strong items are included. As for the magnitude of the DP's, Goode and Hatt note, "as many items as possible should reach a DP of 1.00, and few, if any, should drop below .50" (29). Appendix C, Column 2, shows the DP of each of the 30 items. All the items show highly satisfactory DP's, some of which are extremely strong.

It is interesting to note that all the means which fell within the low quartile came from the anti-environmental group and, conversely, all the means which fell within the high quartile came from the pro-environmental group. Since the primary purpose of the internal consistency technique is to "separate those people who are 'high' from those who are 'low' on (an) attitude continuum," it is immediately apparent that the scale items adequately discriminate between the two opposing groups on the same attitude continuum (29).

At this point it is a reasonable assumption that the test instrument will discriminate between those with pro-environmental attitudes and those who have anti-environmental attitudes (29). Furthermore, since the attitudes are on the same continuum, a determination as

to the degree to which one is oriented toward environmental problems can be ascertained, whether the attitude be pro-environment or anti-environment.

With the scale complete and proven valid, it was decided to actually test the scale on a population which displays no apparent bias toward environmental problems. This is beneficial for two reasons: first, to determine whether or not test items will discriminate between individuals of an unbiased population and second, to test the instrument as a dependent variable, thus attempting to isolate some of the more common social variables which find an association with attitudes toward the environmental crisis.

A small systematic sample was drawn from the Albuquerque, New Mexico, telephone directory. The sample was drawn in the following manner. The total number of residences listed in the phone book was determined. This number was then divided by the number of subjects desired for the sample. By using this quotient it was then possible to draw the sample. If a business address happened to fall on the Nth number, the closest residence address was selected in place of the business address.

When the sample was complete a questionnaire similar to the previous one was sent to 140 subjects. An additional section was added to obtain data for the analysis (see Appendix D).

Even though steps were taken to assure the largest possible return, which mostly consisted of follow-ups, the return rate was 25 per cent. Nonetheless, for the scaling purposes the sample provided a satisfactory group. By examing the discriminative power of the items in Appendix C, it can be seen the array of items portray an adequate DP

which cover a wide range in each type of "weak" and "strong" statements. Again the items demonstrate their capability of discriminating between pro- and anti-environmental attitudes on the same continuum.

It should be pointed out that the subjects which returned the questionnaires displayed some homogeneous characteristics. This is to be expected with this type of sample. For example, during the follow-ups it was noticed that most women expected their husbands as "heads of the household" to fill out the questionnaires. Furthermore, since established residence, married people are over-represented in the phone book, it was noted that the test group was 88 per cent married and 85 per cent male. High income and high education were also overrepresented. A full 67 per cent reported incomes exceeding $11,000 per year, and 67 per cent reported having at least a bachelor's degree with only 10 per cent reporting no college whatsoever. This is partially an artifact of the population composition of the city of Albuquerque.

With these limitations notwithstanding, there are some associations which are worthy of mention. Despite the skewed representation of education and income, associations with pro-environmental attitudes were tested. In addition, political preference, type of community in which the subject was raised, and hobby preference were tested to determine any association with pro-environmental attitudes. For the operationalization of these variables, see Appendix D. The methods of analysis were carried out by means of the gamma test of association as described by Freeman (30).

Findings

Table 5 in Appendix E shows a light negative association between

pro-environment attitudes and income. However, as the table indicates, the cutting point in the income dicotomy was at 13,000. One would not expect this relationship to hold in the lower levels of income because of education, but in this case the above 13,000 per year people probably, to a slight extent, more closely resemble those people previously defined as anti-environmental than those people defined as pro-environmental, at least as far as occupation is concerned.

A positive association between education and pro-environmental attitudes was expected. Certainly within higher education, environmental problems, like other social issues, are brought to the forefront more readily than in society in general. Table 6 (Appendix E) shows a light positive association between education and pro-environment attitudes. Again it is suspected that the overrepresentation of educated people in the sample affected this association. One would expect a higher association between these two variables if lesser educated people were adequately represented.

What was not expected appears in Table 7 (Appendix E). There is a negative association between pro-environmental attitudes and certain areas of concentration in the university. Traditionally, those who have concentrated in non-vocational areas have been more likely to have more liberal orientation toward popular social issues than those in vocational areas. Even though to a slight degree, this is not the case here. It may prove interesting to administer this scale to a university community and test for curriculum tracks as well as other variables associated with popular social movements. Perhaps the "environmental movement" is not just another popular social movement.

In terms of political preference, there was no relationship between pro-environmental attitudes and conservative Democrats and Republicans as opposed to liberal Democrats and Republicans. However, Table 8 (Appendix E) indicates a low positive association between pro-environmental attitudes and being Democrat as opposed to being Republican.

For the final two variables the respondents were asked in what type of community they were raised and what they would most prefer doing in terms of hobbies (see items 10 and 11 in Appendix D). Table 9 (Appendix E) shows that pro-environmental attitudes are lightly associated with coming from a rural background. The final variable, hobby preference, showed no association with pro-environmental attitudes.

These findings are, of course, offered only as pilot findings with no pretense to suggest that they are conclusive. Nonetheless, since few systematic studies are available in this area, it is hoped that these few associations may provide at least a starting point for future research into environmental attitudes and the social factors which influence them.

CHAPTER VI

SUMMARY AND CONCLUSIONS

It was the purpose of this study to investigate the possibility of developing a method for the assessment of attitudes toward environmental problems. A disguised-structured type of instrumentation was selected to be tested in the study. The instrument was tested, using subjects who represent opposed views and vested interests concerning actions to be taken to alleviate insults to the environment. The instrument consisted of statements to be responded to by assigning values to each statement by the subjects. The statements contained items relating to many views pertaining to our present "environmental crisis", and had a distribution over a range from unfavorable to favorable. The instrument included statements that have displaceable, ambiguous, neutral, and anchoring type characteristics.

The background diversity and complexity of problems associated with the control and restoration of the environment was reviewed in relation to various disciplines whose focuses related to the environment. Officials of public health agencies, wildlife management personnel, government officials, zoologists, social scientists, ecological writers, botany professors, environmental engineers, economists, urban and regional planners, and leaders in industry were among those whose

points of view were cited in reference to environmental problems.

A survey of the literature more specific to the Social Sciences showed that attitudes have been studied in a wide variety of ways. Included in such studies were attitudes relating to racial prejudice, social prejudice, attitudes toward self, attitude change, and religious attitudes. The survey also delineated the four major types of instruments which have been developed for the assessment of attitudes. Their advantages and disadvantages were specifically noted.

The instrument developed for use in this study was patterned after such sources as the disguised-structured Latin-American and Negro scales, journals, newspapers, and conference proceedings. The pre-test was conducted in which a total of 77 subject ranked a total of 62 statements into 11 categories from unfavorable to favorable. Anchor statements were selected from those items most consistently placed in the extreme categories. Statements which showed a large amount of displacement toward the unfavorable and favorable ends of the scale were also retained. The final experimental scale consisted of 30 items.

Questions to be resolved by this study were as follows:

a. A qualitative determination of attitudes toward environmental problems can be obtained by questionnaire instrumentation;

b. A quantitative determination of attitudes toward environmental problems can be obtained by questionnaire instrumentation;

c. To determine if persons in health and/or ecological related professions hold different attitudes from those in industrial and/or economic growth oriented professions.

The hypothesis for this study was as follows:

Subjects will tend to displace statements away from their own

position, that is, toward that end of the scale which is opposite their own position.

Hypothesis I: Each criterion group will place more displaceable items into the five categories at the end of the scale opposite their own end of the scale. Specifically, "pro-environmental" subjects will place more items into categories 7 through 11 than in categories 1 through 5.

Hypothesis II: Subjects in the two criterion groups (pro- and anti-) differ from each other in that "pro-environmental" subjects place more items into each of the first five (1-5) categories and fewer items into each of the last five (7-11) categories than do "anti-environmental" subjects.

Two groups of subjects were selected for purposes of testing the hypothesis of this study. They were asked to rank the 30 statements by 11 categories ranging from unfavorable to favorable toward the environment. One group of subjects (pro-environment) consisted of persons working in health and ecology oriented professions from whom strong "pro-evironment" views would be expected. The second group of subjects (anti-environment) consisted of persons that were actively involved in professions whose major efforts were economic and industrial growth.

"Pro-environmental" subjects placed significantly more statements toward the end of the scale opposite their own position, that is, toward the unfavorable end of the scale. "Anti-environmental" subjects placed significantly more statements toward the end of the scale opposite their own position, that is, toward the favorable end of the scale.

"Anti-environmental" subjects placed significantly more statements into the most extreme categories of that end of the scale which was opposite to their own position (categories 7 through 11). "Pro-environmental subjects placed significantly more statements into the most extreme categories of that end of the scale which was opposite to their own position (categories 1 through 5). These findings confirmed the hypothesis of this study and were in keeping with the earlier findings of other investigators developing the Sherif-Hovland type disguised-structured instruments.

This instrumentation approach to the measurement of attitudes toward environmental problems yields data that indicate the direction (qualifying) of a subject's stand on environmental issues. The data from this study indicated that the instrument did significantly differentiate judgment patterns of "anti-environmental" subjects from the "pro-environmental" subjects.

The scale was then validated by using the Likert internal consistency technique. The items more than adequately fit the criteria for an internal consistency scale in that all of the items revealed a strong discriminating power in an array with both "weak" and "strong" items represented throughout the array. This technique also allowed actual scale scores to be assigned to each subject, thus producing a valid ordinal measure. Not only then was an instrument constructed which "significantly" differentiated judgment patterns of "anti-environmental" subjects from the "pro-environmental" subjects, but also the instrument adequately discriminated between the attitude patterns on the same continuum.

The final phase of the study was designed to test the scale on a group of subjects who displayed no apparent reason to be either pro- or anti-environmental. Since the scale adequately discriminated between known groups who had vested interests for having opposing attitudes concerning environmental problems, it was now necessary to test the scale on an unbiased sample to see if the items would still discriminate between those with anti-environmental attitudes and pro-environmental attitudes on the same continuum. Again, the scale proved successful.

Finally, the scale was tested for its possible association to some of the more common social variables. Pilot findings were offered which showed a low positive association between pro-environmental attitudes and (a) income below the $13,000 per year mark as opposed to above the $13,000 per year mark; (b) education; (c) concentrating in a vocational curriculum area as opposed to a non-vocational one while in college; (d) being Democrat as opposed to being Republican; and (5) coming from a rural area as opposed to an urban one.

Because of the small sample size, these findings were regarded as highly tenuous. However, in the light that there are such a limited number of studies in this area, it is hoped that these findings will provide at least a starting point for future research in this much too neglected area.

In conclusion, since attitudes are a vital element in receptiveness to change and predisposition in action, a scale which is capable of assessing attitudes toward environmental problems should prove important in numerous ways. For example, public health agencies could

use such an instrument to determine where environmental education programs are most strongly needed, or use it as an aid in evaluating prospective employees. Social scientists could adopt the instrument as a variate in future research. In short, the uses of its application are left only to the imagination of those who are in a position to use them. In any case, it has been successful in showing that attitudes toward environmental problems can be assessed and this, in itself, should contribute toward the fight against the ongoing environmental crisis.

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APPENDIX A

Original Statements for Test Instrument

ORIGINAL STATEMENTS FOR TEST INSTRUMENT

1. True affluence is not needing anything.

2. The issue of environment has been set forth as a distraction from other problems and issues, such as the draft, the size of our military budget.

3. Few persons realize that the dangers posed by overpopulation are more grave and more immediate in the United States that in less industrialized countries.

4. Electricity should be supplied at moderate cost for normal household needs, but additional increments should rise sharply in price.

5. The environmental crisis will be solved primarily by technology.

6. People should only be allowed tax exemptions for two children.

7. Today a manufacturer is under great pressure to offset rising labor and material costs by developing new techniques, but he has no comparable pressure with respect to clean air and water.

8. Some people are letting pollution become a large issue, hoping to cash in on new multibillion dollar business of antipollution.

9. It is an overstatement to say that if the problem of environmental pollution is not worked out, the country cannot survive.

10. The environment has a certain limited capability to absorb wastes without harmful effects.

11. Civilization, which has made us so successful a species, has overshot itself and now threatens us with its inertia. We are too many and too powerful for our own good.

12. Man comes first before all other forms of life, and all other forms are for his use and pleasure.

13. Families, regardless of social or economic position, should limit the number of children to two, or three at most.

14. The way we shape our physical environment around us will some day shape our lives within that environment.

15. The Vietnam War and the ecological crisis have the same roots. Both are products of a highly technological, mechanistic, dehumanized society.

16. In any properly conducted society, all technology new and old should be under constant review in terms of the needs and goals and aspirations of that society.

APPENDIX A--Continued

17. No item in the physical creation has any purpose save to serve man's purposes.

18. The reason we spend more on the war in Vietnam in two weeks than we have spent on air pollution control in the past ten years is that the war is of more importance to our survival as a nation.

19. To grossly use more than you need to destroy is biologically unsound.

20. Advertising and promotion to increase consumption of electricity should be forbidden due to the ill effect on the environment by its generation.

21. Technology will enable man to always be able to draw on the resources he needs for his use and survival.

22. I feel that our environmental problems will probably be solved by our existing American political and economic institutions.

23. My community would enjoy a higher standard of living if it could develop a more metropolitan image.

24. The limits that must be imposed on social and technological innovation are determined not by scientific knowledge or practical know-how, but by the biological and mental nature of man which is essentially unchangeable.

25. We shouldn't be ashamed to have spent more on the flight of Apollo II than on federal air and water pollution programs combined.

26. The cost of reducing pollution to a minimal effect would be greater than the benefit to be derived.

27. Industrial polluters should be required to pay effluent charges equivalent to the cost to society of polluting the environment.

28. Economic growth is nearly always good for any community.

29. Today's environmental crisis has been produced by a combination of increased population and the explosive acceleration of the total energy and mass deployed for its use by technology.

30. The best types of recreational areas are usually found in or around large metropolitan areas.

31. We shall continue to have a worsening ecological crisis until we reject the Christian axiom that nature has no reason for existence save to serve man.

APPENDIX A--Continued

32. We have been concerned with quantities of goods and services and not with the quality of life, not with tranquility, cleanliness, privacy, and human understanding of one another.

33. God's plan charges woman as man's companion and her primary responsibility is childbearing.

34. The proposed supersonic transport place would have been wasteful, uneconomic, and would have created intolerable sonic booms.

35. The gross national product is an indication that the country is growing and we can expect a better life.

36. Air pollution is not a problem in the town in which I now live nor is it probable that it will be in the near future.

37. What we do about ecology depends on our idea of the man-nature relationship of the universe.

38. Abortion, vasectomy, and sterilization should not be encouraged because it will lead to promiscuity and moral corruption.

39. The sale of reciprocating internal combustion engines should be outlawed by 1980.

40. All bottles should be reusable.

41. Any profound disturbance in the ecological equilibrium is a threat to the maintenance of human life as we know it now.

42. Population growth is a measure of continuing prosperity.

43. Water should be priced according to its true value, to make waste costly and to force industry to employ conservation and recirculation methods.

44. A man should be able to use his private property and any resource on it to his own advantage.

45. Additional industry in our community would provide an increase to the tax base which would help deliver more needed services, such as street repair and refuse collection.

46. Since the roots of our ecological troubles are so largely religious, the remedy must also be essentially religious.

47. We are fouling our air and water, and living in noise and filth that no "animal" would tolerate, while advertising and politicians try to tell us "we've never had it so good."

APPENDIX A--Continued

48. Progressively higher taxes should be levied on automobiles according to car weight and engine displacements.

49. The Government-Industrial complex will endanger the quality of human life on this planet by exploitation of our natural resources.

50. Ecologists are not over-reacting when they make the comment on the flight against pollution, "We are fighting for our very lives."

51. I am a child of all life, and all living beings are my brothers and sisters, my children and grandchildren.

52. There should be a $10,000 limit on subsidies to any one farm owner.

53. Pollution is directly harming life on this planet, which is to say, ruining the environment for humanity itself.

54. Fragmentation and segregation of responsibility for varying jobs, goals, and bureaucratic functions of government, have led to disorder and disunity when dealing with environmental problems.

55. It is impossible to live an ecologically sound life in the United States today.

56. The cost of pollution control technology should come from corporate profits which have been enhanced by the use of the public's environment as industry's private sewer.

57. The year 2000 will see not the emergence of a technological utopia, but rather the progressive destruction of all forms of life.

58. The freeway is a major contributor to the deterioration of our environment. It must be replaced by a means of rapid transit.

59. Our technology has reached a point where it is producing more kinds of things than we really want, and more kinds of things than we really need, and more kinds of things than we can really live with.

60. Tolerance to pollution, crowding, noise, must usually be paid for at a later date in the form of physical and mental misery.

61. Overpopulation is now the dominant problem in all our personal, national, and international planning.

62. There is, indeed, a crisis in urban human activity, the dilemna of a mass society committed to consumption, denying to individuals the satisfaction of communal expression.

APPENDIX B

Rank-order Distribution of the Items Based upon the Mean Judgment Scores

RANK-ORDER DISTRIBUTION OF THE ITEMS BASED UPON THE MEAN JUDGMENT SCORES

	Items	Means
26.	The cost of reducing pollution to a minimum would be greater than the benefit to be derived.	1.27
5.	The environmental crisis will be solved primarily by technology.	1.53
42.	Population growth is a measure of continuing prosperity.	1.53
23.	Most communities would enjoy a higher standard of living if they could develop a more metropolitan image.	2.50
35.	The gross national product is an indication that the country is growing and we can expect a better life.	2.50
34.	The supersonic transport plane proposed in the late 60's would have been wasteful, uneconomic, and would have created intolerable sonic booms.	2.50
22.	Our environmental problems will probably be solved by our personal, national, and international planning.	2.77
57.	The year 2000 will see not the emergence of a technological utopia, but rather the progressive destruction of all forms of life.	3.71
59.	Our technology has reached a point where it is producing more kinds of things than we really want, and more kinds of things than we really need, and more kinds of things than we can really live with.	4.00
11.	Civilization, which has made us so successful a species, has overshot itself and now threatens us with its inertia. We are too many and too powerful for our own good.	5.41
49.	The Government-Industrial complex will endanger the quality of human life on this planet by exploitation of our natural resources.	5.55
62.	There is, indeed, a crisis in urban human activity, the dilemna of a mass society committed to consumption, denying to individuals the satisfaction of communal expression.	5.60

APPENDIX B--Continued

	Items	Means
29.	Today's environmental crisis has been produced by a combination of increased population and the explosive acceleration of the total energy and mass deployed for its use by technology.	5.57
27.	Industrial polluters should be required to pay effluent charges equivalent to the cost to society of polluting the environment.	6.00
61.	Overpopulation is now the dominant problem in all our personal, national, and international planning.	6.00
28.	Economic growth is nearly always good for any community.	6.16
39.	The sale of reciprocating internal combustion engines should be outlawed by 1980.	6.20
21.	Technology will enable man to always be able to draw on the resources he needs for his use and survival.	6.25
56.	The cost of pollution control technology should come from corporate profits which have been enhanced by the use of the public's environment as industry's private sewer.	6.40
58.	The freeway is a major contributor to the deterioration of our environment. It must be replaced by a means of rapid transit.	6.50
32.	We have been concerned with quantities of goods and services and not with the quality of life, not with tranquility, cleanliness, privacy, and human understanding of one another.	7.25
48.	Progressively higher taxes should be levied on automobiles according to car weight and engine displacements.	7.33
47.	We are polluting our air and water, and living in noise and filth that no "animal" would tolerate, while advertisers and politicians try to tell us "we've never had it so good."	7.12
53.	Pollution is directly harming life on this planet, which is to say, ruining the environment for humanity itself.	8.22

APPENDIX B--Continued

	Items	Means
41.	Any profound disturbance in the ecological equilibrium is a threat to the maintenance of human life as we know it now.	8.44
19.	To grossly use more than you need to is biologically unsound.	8.50
60.	Tolerance to pollution, crowding, noise, must usually be paid for at a later date in the form of physical and mental misery.	9.05
20.	Advertising and promotion to increase consumption of electricity should be forbidden due to the ill effect on the environment by its generation.	9.08
40.	All bottles should be reusable.	9.15
31.	We shall continue to have an ecological crisis until we reject the Christian axiom that nature has no reason for existence except to serve man.	9.26

APPENDIX C

Final Scale with the Discriminative Power of Each Item in Both Samples (Rank-ordering Is by the Final Sample)

FINAL SCALE WITH THE DISCRIMINATIVE POWER OF EACH ITEM IN BOTH SAMPLES (RANK-ORDERING IS BY THE FINAL SAMPLE)

	Item	Un-biased DP	Known Group DP
1.	The environmental crisis will be solved primarily by technology.	0.80	1.80
2.	The cost of reducing pollution to a minimum would be greater than the benefit to be derived.	0.80	0.92
3.	Our environmental problems will probably be solved by our existing American political and economic institutions.	0.80	1.58
4.	Any profound disturbance in the ecological equilibrium is a threat to the maintenance of human life as we know it now.	1.00	2.60
5.	Population growth is a measure of continuing prosperity.	1.00	1.25
6.	Overpopulation is now the dominant problem in all our personal, national, and international planning.	1.00	1.80
7.	The supersonic transport plane proposed in the late 60's would have been wasteful, uneconomic, and would have created intolerable sonic booms.	1.20	1.60
8.	Most communities would enjoy a higher standard of living if they could develop a more metropolitan image.	1.20	1.30
9.	To grossly use more than you need is biologically unsound.	1.20	1.90
10.	Progressively higher taxes should be levied on automobiles according to car weight and engine displacements.	1.40	1.50
11.	Today's environmental crisis has been produced by a combination of increased population and the explosive acceleration of the total energy and mass deployed for its use by technology.	1.60	1.70

APPENDIX C--Continued

	Item	Un-biased DP	Known Group DP
12.	The freeway is a major contributor to the deterioration of our environment. It must be replaced by a means of rapid transit.	1.60	1.30
13.	The gross national product is an indication that the country is growing and we can expect a better life.	1.60	1.30
14.	Pollution is directly harming life on this planet, which is to say, ruining the environment for humanity itself.	1.80	2.10
15.	Industrial polluters should be required to pay effluent charges equivalent to the cost to society of polluting the environment.	1.80	1.10
16.	Economic growth is nearly always good for any community.	1.80	1.50
17.	There is, indeed, a crisis in urban human activity, the dilemna of a mass society committed to consumption, denying to individuals the satisfaction of communal expression.	1.80	1.80
18.	Technology will enable man to always be able to draw on the resources he needs for his use and survival.	1.80	2.20
19.	All bottles should be reusable.	1.80	1.20
20.	Tolerance to pollution, crowding, noise, must usually be paid for at a later date in the form of physicial and mental misery.	2.0	1.70
21.	Our technology has reached a point where it is producing more kinds of things than we really want, and more kinds of things than we really need, and more kinds of things than we can really live with.	2.0	1.70
22.	Advertising and promotion to increase consumption of electricity should be forbidden due to the ill effect on the environment by its generation.	2.0	2.3

APPENDIX C--Continued

	Item	Unbiased DP	Known Group DP
23.	We have been over concerned with quantities of goods and services and not with the quality of life.	2.20	1.80
24.	Civilization, which has made us so successful a species, has overshot itself and now threatens us with its inertia. We are too many and too powerful for our own good.	2.40	1.70
25.	The year 2000 will see not the emergence of a technological utopia, but rather the progressive destruction of all forms of life.	2.60	2.60
26.	The sale of reciprocating internal combustion engines should be outlawed by 1980.	2.60	1.80
27.	The cost of pollution control technology should come from corporate profits which have been enhanced by the use of the public's environment as industry's private sewer.	1.60	0.83
28.	We shall continue to have an ecological crisis until we reject the Christian axiom that nature has no reason for existence except to serve man.	2.8	1.8
29.	We are polluting our air and water, living in filth that no "animal" would tolerate, while advertisers and politicians try to tell us "we've never had it so good."	2.8	1.8
30.	The Government-Industrial complex will endanger the quality of human life on this planet by exploitation of our natural resources.	3.2	2.1

APPENDIX D

Personal Data

PERSONAL DATA

1. ____ Sex: (1) Male (2) Female

2. ____ Age

3. ____ Marital Status: (1) Single (2) Married (3) Other

4. ____ Education:

(1) Less than high school diploma.
(2) High school diploma.
(3) Less than college degree but some college work.
(4) Bachelor degree.
(5) Technical training above the bachelor level.
(6) Masters degree.
(7) Post masters work.
(8) Doctorate.

5. ____ If you attended a university, what was your academic major or chosen areas of concentration?

(1) Major profession (architecture, or special pre-professional programs for major professions).
(2) Education.
(3) Minor professions (business, nursing, hygiene, etc.)
(4) Engineering.
(5) Natural Sciences or mathematics.
(6) Behavioral and social sciences.
(7) Humanities and arts.
(8) None of the above apply. Reason: _____

6. ____ Could you briefly describe what you do in your line of work and the organizational setting in which your position is located. Please include your function as director, manager/administrator, scientist/researcher, technician, or other position.

_____

_____

_____

APPENDIX D--Continued

7. ____ Income:

(1) Less than $6,000
(2) $6,001 to 9,000.
(3) $9,001 to 11,000.
(4) $11,001 to 13,000.
(5) $13,001 to 16,000.
(6) $16,001 to 20,000.
(7) $20,001 to 25,000.
(8) Above $25,001.

8. ____ Political Preference:

(1) Liberal Democrat.
(2) Liberal Republican.
(3) Conservative Democrat.
(4) Conservative Republican.
(5) Independent.
(6) Other (specify) _____

9. ____ Do you belong to any organization concerned with environmental issues? If so, which one(s) _____

_____

10. ____ Which of the following most closely fits the type of community in which you were raised:

(1) Large metropolitan area, i.e., Chicago, Los Angelos, etc.
(2) Medium sized urban area, i.e., Albuquerque.
(3) Small urban area, i.e., Las Vegas, New Mexico.
(4) Small town, i.e., Taos, New Mexico.
(5) Farming community, i.e., Belen, New Mexico.
(6) Other (specify) _____

11. ____ Which of the following would you most prefer doing?

(1) Going to a concert.
(2) Attending an opera.
(3) Go skiing.
(4) Play golf.
(5) Backpacking.
(6) Hunting or fishing.
(7) Boating.
(8) Camping with a camper.
(9) Other (specify) _____

We sincerely thank you for your cooperation!

APPENDIX E

Social Factors Associated with Environmental Attitudes

TABLE 5

PERCENTAGE DISTRIBUTION OF ENVIRONMENTAL ATTITUDE SCALE SCORES BY ANNUAL INCOME LEVELS

Environmental Attitude Scale Score	Annual Income Level		
	Below $13,000	Above $13,000	Total
Low (60-96)	29	44	37
Medium (102-117)	36	25	30
High (120-140)	36	31	33
g = -.19	100 (14)	100 (16)	100 (30)

TABLE 6

PERCENTAGE DISTRIBUTION OF ENVIRONMENTAL ATTITUDE SCALE SCORES BY EDUCATION LEVEL

Environmental Attitude Scale Score	Education Level			
	High School	BA	MA or above	Total
Low (60-96)	40	29	36	33
Medium (102-117)	40	43	21	30
High (120-140)	20	29	43	37
g = .19	100 (10)	100 (7)	100 (14)	100 (31)

TABLE 7

PERCENTAGE DISTRIBUTION OF ENVIRONMENTAL ATTITUDE SCALE SCORES BY UNIVERSITY AREA OF CONCENTRATION

Environmental Attitude Scale Score	Area of Concentration: Vocational (1,2,3,4)	Area of Concentration: Non-vocational (5, 6, 7)	Total
Low (60-96)	29	40	33
Medium (102-117)	29	30	30
High (120-140)	41	30	37
g = -.21	100 (17)	100 (10)	100 (27)

TABLE 8

PERCENTAGE DISTRIBUTION OF ENVIRONMENTAL ATTITUDE SCALE SCORES BY POLITICAL PREFERENCE

Environmental Attitude Scale Score	Political Preference: Republican	Political Preference: Democrat	Total
Low (60-96)	40	31	35
Medium (102-117)	40	31	35
High (120-140)	20	37	30
g = .26	100 (10)	100 (16)	100 (26)

TABLE 9

PERCENTAGE DISTRIBUTION OF ENVIRONMENTAL ATTITUDE SCALE SCORES BY COMMUNITY TYPE

Environmental Attitude Scale Score	Community Type		
	Urban	Rural	Total
Low (60-96)	45	25	38
Medium (102-117)	25	42	31
High (120-140)	30	33	31
g = .23	100 (20)	100 (12)	100 (32)

APPENDIX F

Directions to Subjects

Directions to Subjects

We would like your cooperation in a research project that is being sponsored by the School of Health, Department of Environmental Health, University of Oklahoma Medical Center, Oklahoma City, Oklahoma. Please check to see that you have a set of 62 statements and 62 response slots for your use.

We would like for you to serve as a judge. We have collected a series of 62 statements regarding today's concern for the environment. We are uncertain as to whether or not they are favorable or unfavorable statements toward the environment. It will be your task, as a judge, to read each statement carefully and decide whether or not the statement is favorable or unfavorable toward the environment. When you have arrived at an opinion, please record your judgment in the appropriate response slot. You will note on your response sheets that category 1 is most unfavorable and category 11 is most favorable, with the numbers 2 through 10 representing variations of favorableness and unfavorableness. To summarize, read a statement on the statement sheets, judge the statement as to whether or not it is favorable or unfavorable toward the environment, record your judgment on the response slot of your choice on the response sheet.

Please be careful that your dimension of judgment is in terms of whether or not the statement is favorable or unfavorable toward the environment. You will find it easy to judge the statements in terms of a true and false dimension. Your task is not, I repeat--is not to decide if the statements are true or false, but if they are favorable or unfavorable toward the environment.