



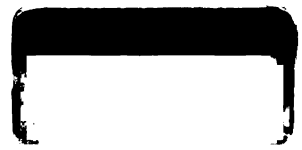
A STUDY OF THE RELATIONSHIP BETWEEN THE  
MULTIPLE SCALOGRAM ANALYSIS ERROR SCORE  
AND CERTAIN PERSONALITY VARIABLES

Thesis for the Degree of M. A.  
MICHIGAN STATE UNIVERSITY

James J. DeJonge

1962

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A Study of the Relationship between  
the Multiple Scalogram Analysis Error Score  
and Certain Personality Variables

by

James J. DeJonge

A THESIS

Submitted to the College of Science and Arts  
Michigan State University of Agriculture and  
Applied Science in partial fulfillment of  
the requirements for the degree of

MASTER OF ARTS

Department of Psychology

1962



23212

11/2/02

## ACKNOWLEDGMENTS

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part outlines the various methods and tools used to collect and analyze data. It mentions the use of surveys, interviews, and focus groups to gather information from stakeholders. Additionally, it discusses the application of statistical analysis to interpret the collected data.

3. The third part describes the process of identifying and addressing the challenges faced by the organization. It highlights the need for a proactive approach to problem-solving and the importance of involving all relevant parties in the decision-making process.

4. The fourth part focuses on the implementation of strategies and initiatives designed to improve the organization's performance. It details the steps involved in developing a strategic plan and the role of each department in its execution.

5. The fifth part concludes the document by summarizing the key findings and recommendations. It reiterates the importance of continuous monitoring and evaluation to ensure the long-term success of the organization's efforts.



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## ABSTRACT

The problem with which the present research was concerned resulted from a study of Lingo's in which a multiple scalogram analysis was carried out on the responses of 100 subjects to the 30 items on the K scale of the Minnesota Multiphasic Personality Inventory. Although no difference was found to exist between subjects who were patients in a mental hospital and subjects who were not patients in terms of their total scores on the K scale, there was a significant difference in the number of errors contributed by the two groups and subjects could be reliably separated on the basis of error scores. The present investigation sought to determine whether differentiation between normal subjects with respect to personality variables is possible on the basis of multiple scalogram analysis error scores.

The subjects for this investigation were 126 students at Michigan State University. Two tests were administered to all subjects in a group testing situation. The first of these was presented to the subjects as a public opinion questionnaire dealing with the foreign policy of the United States. The second instrument was the Edwards Personal Preference



Schedule.

The responses of all subjects on the public opinion questionnaire were analysed by the multiple scalogram method and scored in terms of error scores. Product moment correlations between error scores and scores on the EPPS scales were computed for all subjects.

Significant positive correlations were found to exist between error scores and scores on EPPS scales Succorance and Aggression. EPPS scales Change and Intraception were found to be significantly negatively correlated with error score. Speculation was presented regarding the cause of this relationship and it was suggested that response inconsistency was due to a difference in meaning or significance given to certain test items by high error producing subjects. Some suggestions for future research were made.

Approved Clifford H. Lietze  
Major Professor

Date August 1, 1962

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## I. INTRODUCTION

There are two ways of approaching the study of attitudes. The first might be called the descriptive approach since the aim of this approach is primarily to describe or to measure the phenomenon called attitude. The emphasis here is on the distribution and the subgroupings of attitudes within a given population, and the social scientist using this approach is essentially seeking to determine what people believe. This approach is typically represented by the opinion-polling studies which are so popular around election time. The nature of the second approach is more along evaluative rather than descriptive lines. The second approach is usually more interesting psychologically for the scientist using this approach is seeking to determine why people believe the way they do, i.e., the scientist seeks a relationship between attitudes and personality, demographic, or cognitive factors, in addition to determining what people believe. While the measurement of attitude has been carried out with enthusiasm by investigators, perhaps due to the interest of the public in such studies, surprisingly little research has been done to determine those





factors which correlate with a subject's attitudes. Those studies which have been done in this particular area, e.g., Adorno, et al (1950), Smith, Bruner, and White (1956), have been of such large scale that those interested in attempting research of a similar nature have been discouraged. The present investigation is an attempt to penetrate this relatively forgotten area of social psychology. This study was carried out in order to examine some personality correlates of attitude consistency. The subject of attitude consistency was approached in a unique manner, the measure of this variable being the multiple scalogram analysis error score. However, before elaborating on the problem with which the present research is concerned, the method of analysis used in this study and the rationale for using this method will be discussed.

There are numerous ways of measuring a person's attitudes. One such method is Guttman's scalogram analysis. This method, however, has two weaknesses: it lacks clear meaning for the concept "universe of content" and provides no objective methods for choosing items relevant to this universe; and it provides no adequate concept in its theoretical structure which would account for deviations from pure subject-types. Because of these apparent weaknesses

• Explain the importance of the following factors in the development of a country's economy:

• Human resources • Capital resources • Technology • Infrastructure

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in what seemed to be an effective method of scaling attitudes, Lingoes (1960) devised a method for scaling items according to the criterion set by Guttman but with the above-mentioned weaknesses eliminated. This method is known as multiple scalogram analysis (MSA). Before describing the multiple scalogram method, however, a brief discussion of the scalogram method of Guttman will be given in order to acquaint the reader with some of the concepts to be developed later.

### Scalogram Analysis

The idea basic to Guttman's theoretical model is that of cumulativeness. It is assumed that a set of items with a common "universe of content," i.e., a single idea or trait underlying all statements which can be made in reference to a particular subject, can be arranged in such an order that a subject who responds in a particular way to any item in the set responds in the same manner to all items of lower rank order. It is likewise assumed that subjects can be arranged in an order according to the highest threshold of items to which the subject responds in a particular way.

Before carrying out a scalogram analysis the investigator must first select a set of items which

1. The first step in the process of the scientific method is to ask a question. This question should be based on observation and should be specific and measurable. For example, "Does the amount of sunlight affect the growth of a plant?"

2. The second step is to form a hypothesis. A hypothesis is a statement that can be tested. It should be based on the question and should be a prediction of the outcome. For example, "If a plant receives more sunlight, then it will grow taller." This hypothesis can be tested by growing two plants under different conditions of sunlight and measuring their heights.

3. The third step is to conduct an experiment. The experiment should be designed to test the hypothesis. It should include a control group and an experimental group. The control group is the group that is not being tested, and the experimental group is the group that is being tested. In this case, the control group would be a plant that receives a normal amount of sunlight, and the experimental group would be a plant that receives more sunlight.

4. The fourth step is to collect data. Data is the information that is gathered during the experiment. In this case, the data would be the height of the plants in both groups over a period of time.

5. The fifth step is to analyze the data. This involves looking at the data and seeing if it supports the hypothesis. In this case, if the plant in the experimental group is taller than the plant in the control group, then the hypothesis is supported.

6. The sixth step is to draw a conclusion. A conclusion is a statement that summarizes the results of the experiment. In this case, the conclusion would be that the amount of sunlight does affect the growth of a plant.

#### Conclusion

The scientific method is a process that scientists use to answer questions and solve problems. It is a systematic approach that involves asking a question, forming a hypothesis, conducting an experiment, collecting data, analyzing the data, and drawing a conclusion. The scientific method is a key part of science, and it is used by scientists in all fields of study.

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represent some attitude, opinion, or trait that he is interested in measuring. These items should be constructed in such a way that they vary with respect to either level of difficulty or level or probable endorsement, i.e., the items should possess the property of cumulativeness so that the endorsing of an item which is more difficult or more popular would be likely to imply the endorsing of items which are less difficult or less popular. Such a series is represented, for example, by the items: 1) I am at least 5 feet tall, 2) I am at least 5 feet 6 inches tall, 3) I am at least 6 feet tall. Similarly, the following attitudinal items might form a cumulative series: 1) I would not mind dealing with a colored person in a business transaction, 2) I would not mind having a colored person as a member of my church or social club, 3) I would not mind having a colored person as a close friend. Very little inconsistency of response would be expected with the first set of items given above, since a person responding positively to item 3 would necessarily respond in the same way to items 1 and 2. On the other hand, the degree to which the items in the second set are endorsed would be expected to vary.

The set of items is administered to a number of



people. A matrix is formed by putting the subjects in rank order according to their scores, i.e., the number of positive or negative responses. Items are likewise ranked from highest to lowest. Table 1 gives a hypothetical response matrix so ordered. The score is the number of 1s in the subject's response pattern.

Table 1

		Item			Score
		1	2	3	
Subject	1	1	1	1	3
	2	1	1	0	2
	3	1	0	0	1
	4	0	0	0	0

If the three items appearing in this table were those given above concerning height, we can see that subjects are ordered according to height and items are ordered according to degree of endorsement.

The next step in the method of scalogram analysis is that of evaluating an ordered matrix for scalability. Scalability can be approached from the point of reproducibility. If a subject's response pattern can be reproduced on the basis of his score and a knowledge of item ordering alone, then the set





of items is said to be perfectly scalable. The individual response patterns in a perfectly scalable matrix are said to be pure subject-types. The matrix appearing in Table 1 is perfectly scalable. Knowing that the items are placed in rank order, a score of 2, for example, would indicate a response pattern of ( 1 1 0 ) for subject 2.

Suppose that the matrix in Table 1 were not perfectly scalable, i.e., subject 2 had instead the response pattern ( 1 0 1 ) or ( 0 1 1 ). Error would be introduced if one were to attempt reproducing subject 2's response pattern from a score of 2 and assuming that item ordering was cumulative. Guttman's theoretical structure contains no concept which adequately takes such deviations into consideration. It would seem obvious that such a model is unrealistic. In multiple scalogram analysis an attempt is made to develop a model which does not place such stringent restrictions on departures from the pure subject-types, yet one which produces scales which have the same properties as Guttman scales. Since the present research makes use of the multiple scalogram method a description of this technique will be given.

### Multiple Scalogram Analysis

"Multiple scalogram analysis is an objective

and empirical technique for partitioning a binary response matrix into a number of submatrices, such that each submatrix tends to be maximally homogeneous" (Lingoes, 1960). Submatrices are made maximally homogeneous according to the following three formal criteria:

- 1) Items which have the largest number of elements in common are brought together in order to minimize the distance between adjacent sets of items. Agreement scores, rather than conventional measures of correlation, are used for relating adjacent sets of items.

- 2) Each item is allowed to contribute only its proportional share of the error of the entire submatrix of items and subjects. Error is defined in terms of deviations from pure subject-types which would entail perfect reproducibility of the submatrix. The method of counting errors is discussed below.

- 3) Each subject is similarly allowed to contribute only a certain percentage of error to the submatrix.

Items and subjects are brought together in accordance with these three criteria. The result is a matrix of subject-item responses which is homogeneous and one in which the number of errors is kept at a minimum.



Since multiple scalogram analysis is a relatively new technique and used primarily at Michigan State University and the University of Michigan, an example of the analysis of the hypothetical data presented in Table 2 (Lingoes, 1960) by this method may be in order. In this table a "one" represents a positive response to any of the eight items in a test. A "zero" represents a negative response.

#### Multiple Scalogram Analysis of Hypothetical Data

The first step in the analysis is to sum over columns, writing the totals at the foot of the columns. If any column sum is less than one-half of the number of subjects ( $n$ ), then that column is reflected, i.e., the scoring direction of each item is changed by making every 0 into a 1 and every 1 into a 0. A new response matrix is then constructed which includes the items which have been reflected, as in Table 3. Columns which have been reflected are marked with a "minus" sign above the column number. The sums of the reflected columns are, of course, also reflected by subtracting the original sum from  $n$ . Items 2, 3, 7, and 8 are shown reflected in Table 3. The revised column sums for these items are 20, 15, 20, and 15, respectively.

• 1990年，在《中国农村改革与农村发展》一书中，首次提出“农村小康”的概念，并指出农村小康是农村经济、政治、文化、社会全面发展的综合体现。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。

• 1995年，在《中国农村小康》一书中，进一步阐述了农村小康的内涵，指出农村小康是农村经济、政治、文化、社会全面发展的综合体现。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。

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• 2010年，在《中国农村小康》一书中，进一步阐述了农村小康的内涵，指出农村小康是农村经济、政治、文化、社会全面发展的综合体现。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。

• 2015年，在《中国农村小康》一书中，进一步阐述了农村小康的内涵，指出农村小康是农村经济、政治、文化、社会全面发展的综合体现。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。

• 2020年，在《中国农村小康》一书中，进一步阐述了农村小康的内涵，指出农村小康是农村经济、政治、文化、社会全面发展的综合体现。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。农村小康的实现，是农村改革和发展的最终目标。

Table 2

## Hypothetical Response Matrix

Item	1	2	3	4	5	6	7	8	Score	Errors
S 1	1	0	0	1	0	1	0	1	4	4
2	1	1	1	0	1	1	0	0	5	2
3	1	0	0	0	1	0	0	1	3	4
4	1	1	0	0	1	1	0	1	5	4
5	0	0	1	1	1	1	0	0	4	4
6	1	0	1	1	0	1	0	0	4	2
7	0	0	1	0	1	1	0	0	3	4
8	1	0	0	1	1	0	0	1	4	4
9	1	0	1	1	0	1	1	0	5	4
10	1	0	0	1	1	1	0	0	4	4
11	0	0	1	1	0	1	1	0	4	4
12	1	1	0	0	1	1	0	0	4	4
13	1	0	1	0	1	1	0	0	4	4
14	1	0	0	0	1	1	0	0	3	4
15	1	0	0	1	0	1	1	0	4	4
16	1	0	0	1	0	1	0	0	3	4
17	1	0	0	1	1	1	0	1	5	4
18	1	0	0	1	0	0	0	1	3	4
19	1	0	0	0	1	1	0	1	4	6
20	0	0	1	1	0	1	0	0	3	4
21	1	0	1	1	1	1	0	0	5	2
22	1	0	0	1	0	0	1	1	4	4
23	0	1	1	0	1	1	0	0	4	4
24	1	0	0	1	0	1	1	1	5	6
25	1	1	0	0	1	0	0	1	4	4
Sum	20	5	10	15	15	20	5	10	-	98

The second step in the analysis is to calculate the inter-columnar agreement scores and to form a matrix of these scores ( cf. Table 4). Working from the reflected response matrix (Table 3), the agreement score between any two columns is equal to the number of identical subject-responses in those columns. One agreement occurs between two items each time a subject makes the same response, i.e., both positive (1) or both negative (0), to the two items. Items which have

# THE UNIVERSITY OF CHICAGO

NAME	RESIDENCE	DATE OF BIRTH	DATE OF DEATH	PLACE OF BIRTH	PLACE OF DEATH	CAUSE OF DEATH	DATE OF BURIAL	PLACE OF BURIAL
ALLEN, JAMES	CHICAGO, ILL.	1875	1945	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1945	CHICAGO, ILL.
BROWN, JOHN	CHICAGO, ILL.	1880	1935	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1935	CHICAGO, ILL.
CHAMBERLAIN, JAMES	CHICAGO, ILL.	1885	1940	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1940	CHICAGO, ILL.
CLARK, JAMES	CHICAGO, ILL.	1890	1930	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1930	CHICAGO, ILL.
COLEMAN, JAMES	CHICAGO, ILL.	1895	1925	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1925	CHICAGO, ILL.
DAVIS, JAMES	CHICAGO, ILL.	1900	1920	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1920	CHICAGO, ILL.
EDWARDS, JAMES	CHICAGO, ILL.	1905	1915	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1915	CHICAGO, ILL.
FERGUSON, JAMES	CHICAGO, ILL.	1910	1910	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1910	CHICAGO, ILL.
GILBERT, JAMES	CHICAGO, ILL.	1915	1915	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1915	CHICAGO, ILL.
HARRIS, JAMES	CHICAGO, ILL.	1920	1920	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1920	CHICAGO, ILL.
HENDERSON, JAMES	CHICAGO, ILL.	1925	1925	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1925	CHICAGO, ILL.
HILL, JAMES	CHICAGO, ILL.	1930	1930	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1930	CHICAGO, ILL.
JONES, JAMES	CHICAGO, ILL.	1935	1935	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1935	CHICAGO, ILL.
KELLEY, JAMES	CHICAGO, ILL.	1940	1940	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1940	CHICAGO, ILL.
LEWIS, JAMES	CHICAGO, ILL.	1945	1945	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1945	CHICAGO, ILL.
MARTIN, JAMES	CHICAGO, ILL.	1950	1950	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1950	CHICAGO, ILL.
MCCOY, JAMES	CHICAGO, ILL.	1955	1955	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1955	CHICAGO, ILL.
MURPHY, JAMES	CHICAGO, ILL.	1960	1960	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1960	CHICAGO, ILL.
NICHOLS, JAMES	CHICAGO, ILL.	1965	1965	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1965	CHICAGO, ILL.
OLSON, JAMES	CHICAGO, ILL.	1970	1970	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1970	CHICAGO, ILL.
PETERSON, JAMES	CHICAGO, ILL.	1975	1975	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1975	CHICAGO, ILL.
ROBERTS, JAMES	CHICAGO, ILL.	1980	1980	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1980	CHICAGO, ILL.
SCOTT, JAMES	CHICAGO, ILL.	1985	1985	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1985	CHICAGO, ILL.
SMITH, JAMES	CHICAGO, ILL.	1990	1990	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1990	CHICAGO, ILL.
STEWART, JAMES	CHICAGO, ILL.	1995	1995	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	1995	CHICAGO, ILL.
TAYLOR, JAMES	CHICAGO, ILL.	2000	2000	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	2000	CHICAGO, ILL.
THOMAS, JAMES	CHICAGO, ILL.	2005	2005	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	2005	CHICAGO, ILL.
WALKER, JAMES	CHICAGO, ILL.	2010	2010	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	2010	CHICAGO, ILL.
WATSON, JAMES	CHICAGO, ILL.	2015	2015	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	2015	CHICAGO, ILL.
WILSON, JAMES	CHICAGO, ILL.	2020	2020	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	2020	CHICAGO, ILL.
YOUNG, JAMES	CHICAGO, ILL.	2025	2025	CHICAGO, ILL.	CHICAGO, ILL.	HEART DISEASE	2025	CHICAGO, ILL.

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been reflected should be so indicated by means of a "minus" sign in the row and column headings.

Table 3

Partially Reflected Matrix									
Item		1	$\bar{2}$	$\bar{3}$	4	5	6	$\bar{7}$	$\bar{8}$
S	1	1	1	1	1	0	1	1	0
	2	1	0	0	0	1	1	1	1
	3	1	1	1	0	1	0	1	0
	4	1	0	1	0	1	1	1	0
	5	0	1	0	1	1	1	1	1
	6	1	1	0	1	0	1	1	1
	7	0	1	0	0	1	1	1	1
	8	1	1	1	1	1	0	1	0
	9	1	1	0	1	0	1	0	1
	10	1	1	1	1	1	1	1	1
	11	0	1	0	1	0	1	0	1
	12	1	0	1	0	1	1	1	1
	13	1	1	0	0	1	1	1	1
	14	1	1	1	0	1	1	1	1
	15	1	1	1	1	0	1	0	1
	16	1	1	1	1	0	1	1	1
	17	1	1	1	1	1	1	1	0
	18	1	1	1	1	0	0	1	0
	19	1	1	1	0	1	1	1	0
	20	0	1	0	1	0	1	1	1
	21	1	1	0	1	1	1	1	1
	22	1	1	1	1	0	0	0	0
	23	0	0	0	0	1	1	1	1
	24	1	1	1	1	0	1	0	0
	25	1	0	1	0	1	0	1	0
Sum		20	20	15	15	15	20	20	15

The third step consists of finding the initial item, 1, which is to appear in a dimension. This is done by selecting the item which has the largest column sum from the reflected matrix of Table 3. The logic for this step is the fact that the item set which contains the largest number of positive elements (1s) after all



• The first step in the process is to identify the problem.

• The second step is to analyze the problem.

• The third step is to develop a solution.

• The fourth step is to implement the solution.

• The fifth step is to evaluate the results.

• The sixth step is to monitor the results.

• The seventh step is to report the results.

• The eighth step is to conclude the process.

• The ninth step is to document the results.

• The tenth step is to review the process.

• The eleventh step is to improve the process.

item sets with  $ps$  less than .5 have been reflected is the one which is most likely to include other sets as proper subsets. In the case of ties among column sums, item 1 is selected arbitrarily. The effect of making an arbitrary decision in this matter is merely that a different ordering of both items and dimensions is obtained. In the present example, item 1 was chosen from among items 1, 2, 6, and 7 with tied column sums of 20. One keeps track of the variables used by placing a check mark over the item numbers in Table 2.

Table 4

## Item Agreement Matrix

Item	1	2	3	4	5	6	7	8
1	x	17	20	14	14	15	17	10
-2	17	x	14	20	10	17	15	14
-3	20	14	x	13	13	10	14	5
4	14	20	13	x	5	13	10	13
5	14	10	13	5	x	14	20	13
6	15	17	10	13	14	x	17	20
-7	17	15	14	10	20	17	x	14
-8	10	14	5	13	13	20	14	x

The fourth step in the analysis consists of selecting the next item, 1, to be linked with item 1. This is accomplished by finding the item which has either the highest agreement score or the highest disagreement score with item 1. Item 1 and item 1 are then placed in a new matrix (Table 5), reflecting or re-reflecting item 1, if the largest value in the



ith column is the disagreement score. A "plus" sign is placed over the item number in Table 5 if a re-reflection has occurred. After item j has been linked with item i, the next item j is linked with the previous item i. If ties are encountered, then one should select the item to pair with the previous one which introduces the fewest errors, i.e., the 01 response pattern.

In our example, item 3 has the highest agreement score with item 1. Therefore, item 1 and item 3 form the first two columns of Table 5.

The final step is to determine the amount of error introduced by bringing in item j. Each displacement of a 0 or a 1, i.e., a 01 response pattern, is counted as two errors. If the amount of error, as determined by  $\left[ \frac{\sum^{\circ} m}{nm} - \frac{\sum^{\circ} m-1}{n(m-1)} \right]$  where  $n$  equals the number of subjects and  $m$  is the number of items in the dimension, exceeds some predetermined value, e.g., .10n or .15n, then a new dimension must be begun and the initial item of this dimension found. The latter is done by selecting the item with the largest column among those items in Table 3 which have not been used previously in any dimension. On the other hand, if the amount of error is less than the above criterion, then one must find what item has



the highest agreement score or disagreement score with the last item included in the dimension. This new item represents item 1, and the previous item 1, becomes item 1. The fifth step is then repeated as before.

In the present example, the links between items 1 and 3, 3 and 8, and 8 and 6 meet the above criterion. The links between item 6 and either item 4 or item 7 exceed the criterion and therefore a new item 1 is selected from those items in Table 3 not previously used as the initial item of a second dimension. Beginning with item 7, the links between items 7 and 5, 5 and 4, and 4 and 2 result from the repetition of the third, fourth, and fifth steps. This set of items, along with items 1, 3, 8, and 6, produce the data appearing in Tables 5 and 6.

Inspection of Tables 5 and 6 indicate that any two subjects with equal scores have identical response patterns. For example, subjects 4 and 19 both received a score of 3 and both have answered the four items in the same way, i.e., 1110. This example also illustrates the concept of perfect reproducibility. Knowing that items are placed in rank order and the scores for each subject, all responses can be predicted with 100 per cent accuracy. For example, subject 14s scores are 2 and 3 on the two sets of items, yielding



a predicted response pattern for the 8 ordered items of: 11001110.

It should be pointed out that in actual practice perfect reproducibility is quite rare. In addition, as the error criterion is lowered, more error appears in each dimension and the reproducibility is consequently decreased. A lower criterion, however, does allow more accurate assessment of subjects with respect to error. Resolution of this dilemma is only a matter of experience and purpose. In the present investigation an error criterion of  $.15n$  was used. The criterion was not lowered further since the resulting dimensions would then tend to be meaningless.



Table 5

		Dimension I				Score
Item		1	3	8	6	
S	1	1	1	1	0	3
	2	1	0	0	0	1
	3	1	1	1	1	4
	4	1	1	1	0	3
	5	0	0	0	0	0
	6	1	0	0	0	1
	7	0	0	0	0	0
	8	1	1	1	1	4
	9	1	0	0	0	1
	10	1	1	0	0	2
	11	0	0	0	0	0
	12	1	1	0	0	2
	13	1	0	0	0	1
	14	1	1	0	0	2
	15	1	1	0	0	2
	16	1	1	0	0	2
	17	1	1	1	0	3
	18	1	1	1	1	4
	19	1	1	1	0	3
	20	0	0	0	0	4
	21	1	0	0	0	1
	22	1	1	1	1	4
	23	0	0	0	0	0
	24	1	1	1	0	3
	25	1	1	1	1	4

Table 6

Dimension II

Item	7	5	4	2	Score
S 1	1	0	0	0	1
2	1	1	1	1	4
3	1	1	1	0	3
4	1	1	1	1	4
5	1	1	0	0	2
6	1	0	0	0	1
7	1	1	1	0	3
8	1	1	0	0	2
9	0	0	0	0	0
10	1	1	0	0	2
11	0	0	0	0	0
12	1	1	1	1	4
13	1	1	1	0	3
14	1	1	1	0	3
15	0	0	0	0	0
16	1	0	0	0	1
17	1	1	0	0	2
18	1	0	0	0	1
19	1	1	1	0	3
20	1	0	0	0	1
21	1	1	0	0	2
22	0	0	0	0	0
23	1	1	1	1	4
24	0	0	0	0	0
25	1	1	1	1	4



Scalogram and Multiple Scalogram Analysis: A Comparison

It would be well to point out some similarities and differences between Guttman's scalogram method of analysis and multiple scalogram analysis. First, while MSA results in scales which have the same property as Guttman's scales, i.e., cumulativeness, there is no real need for the concept "universe of content" in the MSA model. The investigator lets the responses of the subjects themselves group the items instead of subjectively choosing items which best fit the model. While it is not recommended that the scientist using MSA abandon all criteria for item selection, it is pointed out that he is not bound to selecting items which have the greatest probability of fitting the model. MSA would seem to be the more objective of the two approaches.

A second difference is that of approach to the data. Scalogram analysis takes a set of items and tests the homogeneity of these items. MSA, on the other hand, both finds and tests the homogeneity of a group of items. MSA would appear to be the more efficient of the two methods in handling the same data.

A third difference between scalogram analysis and the multiple scalogram method is that the latter

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1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102
103	104	105	106	107	108
109	110	111	112	113	114
115	116	117	118	119	120
121	122	123	124	125	126
127	128	129	130	131	132
133	134	135	136	137	138
139	140	141	142	143	144
145	146	147	148	149	150
151	152	153	154	155	156
157	158	159	160	161	162
163	164	165	166	167	168
169	170	171	172	173	174
175	176	177	178	179	180
181	182	183	184	185	186
187	188	189	190	191	192
193	194	195	196	197	198
199	200	201	202	203	204
205	206	207	208	209	210
211	212	213	214	215	216
217	218	219	220	221	222
223	224	225	226	227	228
229	230	231	232	233	234
235	236	237	238	239	240
241	242	243	244	245	246
247	248	249	250	251	252
253	254	255	256	257	258
259	260	261	262	263	264
265	266	267	268	269	270
271	272	273	274	275	276
277	278	279	280	281	282
283	284	285	286	287	288
289	290	291	292	293	294
295	296	297	298	299	300
301	302	303	304	305	306
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331	332	333	334	335	336
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355	356	357	358	359	360
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445	446	447	448	449	450
451	452	453	454	455	456
457	458	459	460	461	462
463	464	465	466	467	468
469	470	471	472	473	474
475	476	477	478	479	480
481	482	483	484	485	486
487	488	489	490	491	492
493	494	495	496	497	498
499	500	501	502	503	504
505	506	507	508	509	510
511	512	513	514	515	516
517	518	519	520	521	522
523	524	525	526	527	528
529	530	531	532	533	534
535	536	537	538	539	540
541	542	543	544	545	546
547	548	549	550	551	552
553	554	555	556	557	558
559	560	561	562	563	564
565	566	567	568	569	570
571	572	573	574	575	576
577	578	579	580	581	582
583	584	585	586	587	588
589	590	591	592	593	594
595	596	597	598	599	600
601	602	603	604	605	606
607	608	609	610	611	612
613	614	615	616	617	618
619	620	621	622	623	624
625	626	627	628	629	630
631	632	633	634	635	636
637	638	639	640	641	642
643	644	645	646	647	648
649	650	651	652	653	654
655	656	657	658	659	660
661	662	663	664	665	666
667	668	669	670	671	672
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715	716	717	718	719	720
721	722	723	724	725	726
727	728	729	730	731	732
733	734	735	736	737	738
739	740	741	742	743	744
745	746	747	748	749	750
751	752	753	754	755	756
757	758	759	760	761	762
763	764	765	766	767	768
769	770	771	772	773	774
775	776	777	778	779	780
781	782	783	784	785	786
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793	794	795	796	797	798
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811	812	813	814	815	816
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823	824	825	826	827	828
829	830	831	832	833	834
835	836	837	838	839	840
841	842	843	844	845	846
847	848	849	850	851	852
853	854	855	856	857	858
859	860	861	862	863	864
865	866	867	868	869	870
871	872	873	874	875	876
877	878	879	880	881	882
883	884	885	886	887	888
889	890	891	892	893	894
895	896	897	898	899	900
901	902	903	904	905	906
907	908	909	910	911	912
913	914	915	916	917	918
919	920	921	922	923	924
925	926	927	928	929	930
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985	986	987	988	989	990
991	992	993	994	995	996
997	998	999	1000	1001	1002

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is presently limited to handling dichotomous data while Guttman's method can be used on items with any number of categories of response.

Since multiple scalogram analysis is a relatively new technique and used primarily at Michigan State University and at the University of Michigan, a few illustrative studies making use of this method will be described.

### Previous Research

The use of MSA has been primarily in connection with voting behavior. Lingoes (1960) analysed the voting responses of the 83rd United States Senate on 256 issues. The MSAs yielded 15 dimensions, accounting for 105 of the 128 Sample A issues, and twelve dimensions, accounting for 106 of the Sample B issues. Dimension sizes varied between three and 25 items. From the results of the analysis it was possible to select eight key senators whose voting patterns could be used as a basis for predicting the voting patterns of the other senators. The purpose of this study was primarily to illustrate the properties of a new procedure of analysis and to compare the results of the analysis with other standardized procedures.



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An MSA of the responses of 100 soldiers who had been in combat on nine fear symptoms (Stouffer, et al, 1950) yielded two dimensions of seven items dealing with gastro-intestinal symptoms and two items related to musculo-skeletal symptoms (Lingoes, 1960). The purpose of this study was again to illustrate the properties of the multiple scalogram method.

An analysis of 22 items relating to driver, car, and environmental characteristics occurring in 955 fatal car accidents resulted in scales ranging from two items to six items. Item content of the scales corresponded with the above-three characteristics (Allen, 1962).

### Problem

The problem with which the present research is concerned resulted from a study of Lingoes (1960) in which a multiple scalogram analysis was carried out on the responses of 100 subjects to the 30 items on the K scale of the Minnesota Multiphasic Personality Inventory. The analysis yielded only one dimension of five items for the sample of subjects. Similar results were obtained using the scalogram method of Guttman. No difference was found to exist between subjects who were patients in a mental hospital and those who were not patients in terms of their total scores on the K

scale. However, there was a significant difference in the number of errors contributed by the two groups and subjects could be reliably separated on the basis of error scores.

The question has arisen whether further differentiation between subjects with respect to personality variables is possible on the basis of MSA error scores. Assuming that the MSA error score is a measure of response consistency, a low error score indicating a more consistent response pattern than a high error score, one would expect that groups of normal subjects could be differentiated with respect to these scores. This line of thought follows that of Berg (1957), i.e., deviant response patterns in one area are associated with deviant responses in other areas.

The present investigation sought to determine whether differentiation between normal subjects with respect to personality variables as measured by the Edwards Personal Preference Schedule is possible on the basis of multiple scalogram analysis error scores. A discussion of the method used in attacking this problem is given in the next chapter.

1. The first step in the process of the development of a new product is the identification of a market need. This is often done through market research, which can be conducted in a number of ways, including surveys, focus groups, and interviews with potential customers.

2. Once a market need has been identified, the next step is to develop a concept for the new product. This involves creating a detailed description of the product, including its features, benefits, and target market. This concept is then used to create a business plan, which outlines the financial and operational aspects of the new product.

3. The third step in the process is to develop a prototype of the new product. This is often done using 3D printing or other manufacturing techniques. The prototype is then used to test the product and gather feedback from potential customers. This feedback is used to refine the product and make any necessary changes.

4. The fourth step in the process is to manufacture the new product. This involves creating a detailed manufacturing plan, which outlines the materials, equipment, and processes required to produce the product. The manufacturing plan is then used to create a production schedule, which outlines the timing and sequence of the manufacturing process.

5. The fifth step in the process is to distribute the new product. This involves creating a distribution plan, which outlines the channels and methods for distributing the product. The distribution plan is then used to create a sales and marketing plan, which outlines the strategies and tactics for promoting the product and generating sales.

6. The sixth step in the process is to monitor the performance of the new product. This involves tracking sales, revenue, and other key performance indicators (KPIs) to determine the success of the product. This information is then used to make any necessary adjustments to the product, manufacturing process, or distribution plan.

7. The seventh step in the process is to evaluate the overall success of the new product. This involves comparing the actual performance of the product to the goals and objectives set out in the business plan. This evaluation is used to determine the overall success of the product and to identify any areas for improvement.

8. The eighth step in the process is to use the information gathered from the evaluation to inform the development of future products. This involves identifying the strengths and weaknesses of the current product and using this information to create a roadmap for the development of future products. This roadmap is then used to guide the development of new products and to ensure that they are designed to meet the needs of the market.

## II. METHOD

The design of the present research called for the administration of an attitude scale and a personality test to a number of subjects. The attitude scale was analysed by the multiple scalogram method and scored in terms of error scores. Error scores were correlated with scale scores on the personality test. In this chapter the subjects, tests, and procedure used in the present investigation are described.

### Subjects

The subjects for this investigation were 126 students at Michigan State University who were enrolled in introductory psychology courses during the 1962 Winter term. The subjects were approximately equally distributed with respect to sex. Although the subjects were not differentiated with respect to class level, the majority of the subjects were assumed to be sophomores or juniors.

### Tests

Two tests were administered to all subjects. The first of these was presented as a public opinion

• The first of these is the fact that the  
• government has been unable to  
• secure the necessary funds to  
• carry out its policy of  
• maintaining the value of the  
• pound sterling at its  
• present level. This has  
• led to a series of  
• devaluations which have  
• caused a loss of confidence  
• in the pound and have  
• led to a fall in the  
• value of the pound  
• against the dollar. This  
• has had a serious  
• effect on the balance of  
• payments and has led to  
• a large trade deficit.  
• The second of these is the  
• fact that the government  
• has been unable to  
• secure the necessary  
• funds to carry out its  
• policy of maintaining the  
• value of the pound  
• sterling at its present  
• level. This has led to a  
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• fact that the government  
• has been unable to  
• secure the necessary  
• funds to carry out its  
• policy of maintaining the  
• value of the pound  
• sterling at its present  
• level. This has led to a  
• series of devaluations  
• which have caused a  
• loss of confidence in  
• the pound and have led  
• to a fall in the value  
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• fact that the government  
• has been unable to  
• secure the necessary  
• funds to carry out its  
• policy of maintaining the  
• value of the pound  
• sterling at its present  
• level. This has led to a  
• series of devaluations  
• which have caused a  
• loss of confidence in  
• the pound and have led  
• to a fall in the value  
• of the pound against  
• the dollar. This has  
• had a serious effect  
• on the balance of  
• payments and has led  
• to a large trade deficit.

questionnaire dealing with the foreign policy of the United States.<sup>1</sup> It consisted of 44 items from the Scale of Attitudes toward War and Peace (Droba, 1931) and 16 items selected at random from the Public Opinion Questionnaire about War and Foreign Policy (Wrigley, 1961). Certain items on the Scale of Attitudes were modified in keeping with the issues to which they referred. Preliminary research indicated that an attitude scale of the equal appearing interval type produced more meaningful dimensions than other types of attitude scales when analysed by the multiple scalogram method. Attitudes dealing with foreign policy was chosen for measurement since it is a subject about which people have more or less crystallized views and yet one in which there is a substantial division of opinion.

The second instrument was the Edwards Personal Preference Schedule (Edwards, 1954). This particular personality test was felt to suit best the purpose and scope of this research. The Edwards Personal Preference Schedule (EPPS) not only can be administered quickly to a large number of subjects, but it also provides measures of fifteen relatively independent personality variables based on Murray's list of manifest needs (1938). In addition, in the EPPS an attempt is made

<sup>1</sup>See Appendix B below.





to minimize the influence of social desirability in test responsiveness. This is accomplished by the forced-choice technique in which items of equal weight with respect to social desirability are paired. The names of the variables which the EPPS measures are:

- (1) achievement, (2) deference, (3) order,
- (4) exhibition, (5) autonomy, (6) affiliation,
- (7) intraception, (8) succorance, (9) dominance
- (10) abasement, (11) nurturance, (12) change,
- (13) endurance, (14) heterosexuality, (15) aggression.

The EPPS also provides means of measuring response consistency. By comparing the number of identical choices made on two sets of the same 15 items, it is possible to determine whether the subject is responding to the items by chance alone or in accordance with his personality structure. In the present research a consistency score of eleven or more identical choices out of the possible 15 was taken as the criterion for keeping or discarding a subject's tests, the probability of eleven or more identical choices occurring on the basis of chance alone being approximately .06.

The public opinion questionnaire and the Edwards Personal Preference Schedule were administered in a group testing situation. There were three groups

[illegible][illegible]

the *Journal of the American Medical Association* (JAMA) and the *New England Journal of Medicine* (NEJM) are the most widely cited journals in the field of medicine. The *Journal of the American Medical Association* (JAMA) is a peer-reviewed medical journal that publishes research, clinical practice, and medical education. The *New England Journal of Medicine* (NEJM) is a peer-reviewed medical journal that publishes research, clinical practice, and medical education. Both journals are published by the American Medical Association (AMA) and the Massachusetts Medical Society (MMS).

of approximately 45 subjects each. Before the tests were given, the following statement was read to the subjects:

"A group of us in Psychology have been working during the past months on methods of determining the response patterns that occur when people take certain kinds of psychological tests. But, in order to perfect these methods, we have to try them out on actual data -- and that is where you come in. Each of you will be given two of these tests. One is a survey of public opinion about the United States' foreign policy. The second is a standardized personality test. There are instructions on each of these which you shouldn't have any trouble understanding. However, if you do have any questions, feel free to ask them.

"There are three things I would like to ask of you. First, we would like to keep your responses as anonymous as possible so please do not put your name or student number on these tests. Second, you are asked to work as quickly as possible and not to omit any items. The tests should take between an hour and an hour and one-half to complete. Third, after completing both tests, place the IBM answer sheet inside the opinion survey and hand them in. Thank you."

### Procedure

The responses of the subjects on the public opinion questionnaire were analysed by the multiple scalogram method as previously described. The Michigan State University computer laboratory library program K9M was used for this purpose. The error score for each subject was calculated from the result of this analysis. Product moment correlations between

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the work.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete them.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress to ensure that the objectives are being met.

5. Finally, the fifth step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and identifying any areas for improvement or further action.

[illegible]

error scores and scores on the EPPS scales were computed for all subjects. Michigan State University computer laboratory library program K5M was used.



### III. RESULTS

#### Multiple Scalogram Analysis

Using a criterion of .15n for the amount of error allowable in any one dimension, the multiple scalogram analysis yielded ten dimensions which accounted for 46 of the 60 public opinion items. Dimension sizes varied between three and 16 items.

Error scores for the 126 subjects on all ten dimensions varied between zero and 16. Table 7 gives the frequency distribution of the error scores. The distribution was skewed to the right, the modal error score being 6, and the mean error score 6.61.

#### Product Moment Correlation

Product moment correlations between error scores and EPPS scale scores are given in Table 8. Correlations significant at the .05 level are indicated by an asterisk. Significant positive correlations were found to exist between error scores and scores on EPPS scales Succorance and Aggression. EPPS scales Change and Intraception were found to be significantly

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negatively correlated with the MSA error score.  
Differences with respect to sex are discussed in  
Appendix A.

Table 7

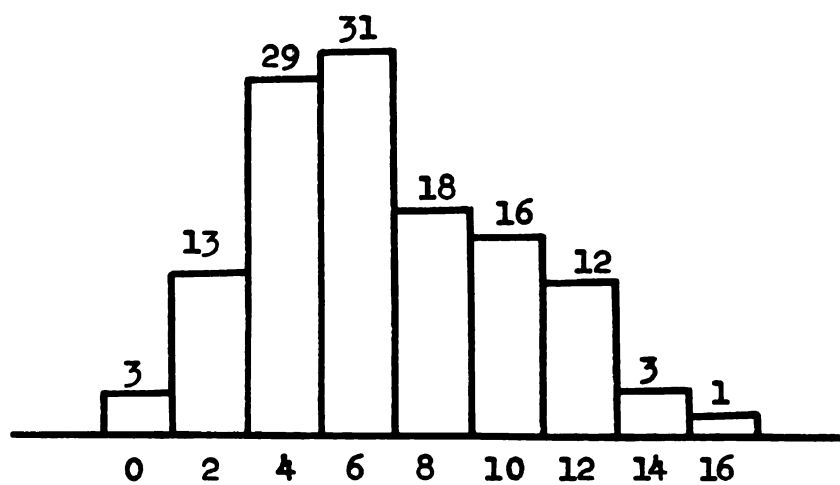
Frequency Distribution of MSA Error Scores

Table 8

Correlations between Error and EPPS Scale Scores

Scale	Correlation
1. ach	.151
2. def	-.147
3. ord	-.093
4. exh	-.058
5. aut	.001
6. aff	.170
7. int	-.186 *
8. suc	.225 *
9. dom	-.054
10. aba	.008
11. nur	.073
12. chg	-.257 *
13. end	-.112
14. het	.036
15. agg	.213 *

Correlations significant at the .05 level are indicated by an asterisk.

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2. The second of these is the fact that the	the second of these is the fact that the
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10. The tenth of these is the fact that the	the tenth of these is the fact that the
11. The eleventh of these is the fact that the	the eleventh of these is the fact that the
12. The twelfth of these is the fact that the	the twelfth of these is the fact that the
13. The thirteenth of these is the fact that the	the thirteenth of these is the fact that the
14. The fourteenth of these is the fact that the	the fourteenth of these is the fact that the
15. The fifteenth of these is the fact that the	the fifteenth of these is the fact that the
16. The sixteenth of these is the fact that the	the sixteenth of these is the fact that the
17. The seventeenth of these is the fact that the	the seventeenth of these is the fact that the
18. The eighteenth of these is the fact that the	the eighteenth of these is the fact that the
19. The nineteenth of these is the fact that the	the nineteenth of these is the fact that the
20. The twentieth of these is the fact that the	the twentieth of these is the fact that the

2. The second of these is the fact that the

#### IV. DISCUSSION

The results of the present investigation suggest that differentiation between normal subjects with respect to personality variables is possible on the basis of multiple scalogram analysis error scores. In this chapter a brief discussion of the results of this study is presented and suggestions made for future research.

The aim of the present research was to determine whether normal subjects could be differentiated with respect to personality variables on the basis of multiple scalogram analysis error scores. It was found that in a specific situation a differentiation between subjects could be made. The results of this investigation verify those of Lingoes (1960), i.e., error scores seem to be indicative of erratic personality. Lingoes suggests that such response inconsistency is perhaps due to a difference in the meaning or significance given to certain test items by high error producing subjects. This explanation would seem to be particularly true in the case of attitudinal items, since the items appearing

on the various dimensions resulting from a multiple scalogram analysis are not items which would tend to be ambiguous, i.e., items in the middle of the attitude scale, but items with seemingly clear-cut meanings. The results of this study also suggest that response inconsistency may be due to an unsuccessful attempt on the part of the subject to compensate for some undesirable element present in his personality structure. The rationale for this assumption is discussed below.

It should be emphasized at this point that the type of consistency to which is referred in this study is not the same as that to which is referred in present-day cognitive theory, e.g., Festinger (1957). Whereas the latter type of consistency usually refers to a more or less internal process which occurs, consistency, used in the present context, deals only with an aspect of the relationship of a single individual with respect to others in his group, i.e., a more or less external relationship.

In an attempt to account for the results of the present investigation it was speculated that subjects with high error scores are typified by strong dependency needs and subjects with low error scores have low dependency needs. The following rationale

for this assumption is given: A number of factors characterize the person who is overly dependent. On the one hand, he has an exaggerated desire for sympathy, encouragement, and social approval usually stemming from a situation in which these needs were satisfied by over-protecting parents. At the same time, he does not want to experience new situations which would tend to place him in positions where he would feel helpless and insecure. He also has very little sense of responsibility and concern for other people. On the other hand, the overly dependent person is frustrated because of his dependent nature. This gives rise to a vigorous desire for self-assertion and other aggressive behavior (Cameron and Magaret, 1951, Baldwin, 1955). A person with such a need pattern would tend to score high on EPPS scales Succorance and Aggression and low on the Change and Intraception scales. The reader is directed to Table 9 below for a list of the manifest needs associated with the four EPPS scales mentioned above (Edwards, 1954).

The present investigation found that persons with such a need pattern tended to have high multiple scalogram analysis error scores, i.e., tended to be inconsistent with respect to their pattern of

attitudes. Conversely, persons scoring low on EPPS scales Succorance and Aggression and high on the Change and Intraception scales tended to be more consistent with respect to their attitude patterns, i.e., tended to have low error scores.

The question is then raised why the overly dependent person is more apt to be inconsistent when it comes to expressing opinions regarding some social issue. The following explanation is suggested: The overly dependent person does not want to appear so to other people. Therefore, in situations in which he feels such a disclosure might be made, he may attempt to conceal his nature by compensating in some way, i.e., by an exaggerated trend toward independent self-sufficiency. In the present case, when the overly dependent person was asked to express his opinions regarding war and foreign policy, he responded in the way he thought a person far less dependent would respond. Unfortunately, however, he was "caught" by virtue of a high error score which reflected his inconsistent response pattern.

Before assuming any relationship between error scores and personality variables to be universal, further research is imperative. Such research would



necessarily involve a replication of the present study. In addition, a more comprehensive test, such as the MMPI, should prove valuable in finding other variables which may be related to response consistency. It is also suggested that an investigation be made to determine whether similar results are obtained using different types of attitude scales. The equal appearing interval type of attitude scale was used in the present study because previous research indicated that this type of scale seemed to lend itself more readily to analysis by the multiple scalogram method, i.e., it produced more meaningful dimensions as well as a better distribution of error scores. It is finally suggested that an investigation be made dealing with the effect of varying the error criterion. Although the relationship seems to be similar, there is evidence that error scores resulting from multiple scalogram analyses under different criteria for error correlate with somewhat different personality variables. A discussion of this subject was felt to be beyond the scope of this paper, but such research is essential for a complete evaluation of the multiple scalogram analysis error score as a tool for differentiating subjects.

Table 9

Manifest Needs Associated with EPPS VariablesAggression

- to attack contrary points of view
- to tell others what one thinks about them
- to criticize others publicly
- to make fun of others
- to tell others off when disagreeing with them
- to get revenge for insults
- to become angry
- to blame others when things go wrong
- to read newspaper accounts of violence

Change

- to do new and different things
- to travel
- to meet new people
- to experience novelty and change in daily routine
- to experiment and try new things
- to eat in new and different places
- to try new and different jobs
- to move about the country and live in different places
- to participate in new fads and fashions

Intracception

- to analyse one's motives and feelings
- to observe others
- to understand how others feel about problems
- to put one's self in another's place
- to judge people by why they do things rather than what they do
- to analyse the behavior of others
- to analyse the motives of others
- to predict how others will act

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Table 9--Continued

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Succorance

to have others provide help when in trouble  
to seek encouragement from others  
to have others be kindly  
to have others be sympathetic and understanding  
about personal problems  
to receive a great deal of affection from others  
to have others do favors cheerfully  
to be helped by others when depressed  
to have others feel sorry when one is sick  
to have a fuss made over one when hurt

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Table 10

## Correlations between Error and EPPS Scale Scores

Scale	Males	Females
1. ach *	-.041	.361 *
2. def	-.161	-.118
3. ord	-.187	.079
4. exh	-.023	-.141
5. aut	-.068	.114
6. aff	.237	-.039
7. int	-.323 *	-.078
8. suc	.332 *	.017
9. dom	-.127	.263
10. aba	-.256	-.038
11. nur	.083	-.206
12. chg	-.047	-.383 *
13. end	.007	.077
14. het	.221	.020
15. agg	.282 *	.306 *

Correlations significant at the .05 level are indicated by an asterisk.

## Appendix B

### Public Opinion Survey on War and Foreign Policy

Below are 60 statements which represent widely-held opinions about war and foreign policy. These statements have been selected from speeches, newspapers, books and other sources. They have been chosen in such a way as to represent a variety of viewpoints. As a result, some people are likely to agree with some of the statements, and other people with other statements.

After reading each statement, you are requested to record your personal opinion regarding it. Do so by placing a check mark before every statement with which you agree. Interpret the statements in accordance with your own experience.

Please answer frankly. This is not a test, and there are no "right" or "wrong" answers. We are only interested in finding out how people feel about war and foreign policy, and our interest is in the percentages who agree and disagree with each statement. Your responses will be treated as completely confidential.

1. War in the modern world is as needless as it is suicidal.
2. Many people benefit by learning the lesson of war-time discipline.
3. Only those military units which afford training to the body and mind should be retained.
4. Army discipline injures self-respect and individuality.
5. The losses of human life and property, great as they are, are small evils compared to the undermining of morals and the lowering of standards of culture and civilization caused by war.
6. Wars are justifiable only when waged in defense of weaker nations.
7. War is ennobling and stimulative of the highest and best qualities of man.
8. It is the moral duty of the individual to refuse to participate in any way in any war, no matter what the cause.
9. Might makes right.



10. The most we can hope to accomplish is the partial elimination of war.
11. Economic aid to foreign countries is more useful in furthering the cause of democracy than is military aid.
12. The evils of war are slightly better than its benefits.
13. The image of the United States abroad has suffered since World War II.
14. Until an equivalent discipline is organized, war must have its own way.
15. Because right may be more important than peace, war may be the lesser of two evils.
16. Along with patriotism, world citizenship should be taught in all secondary schools.
17. Persons should pledge themselves never to aid in any future war.
18. It is almost impossible to have a large military force without being tempted to use it.
19. The Russian people basically want to live happily and in peace.
20. War is the tonic of the races.
21. There is little chance of our being involved in a nuclear war.
22. When the next war breaks out we should tell the diplomats who lead us into it that we will not follow them.
23. Militarism is necessary for the proper defense and protection of the individuals of a country.
24. So long as any people, white, black, brown or yellow, hold weapons in their hands, we must not commit the folly of disarming.
25. The best way of preventing war involving the United States is to keep our nation militarily stronger than our enemies.
26. Under the scourge of war a nation has no opportunity for cultural development.
27. The soldier suffers tremendously and gains very little.
28. The evils that war brings far outweigh any possible benefits.
29. There is no progress without war.



30. We should have a moderate amount of military training in our schools.
31. No scheme of aggression or conquest can be pursued for any length of time without enfeebling victor as well as vanquished.
32. When war threatens we should refuse the call to service and increase our anti-war activity.
33. We shall never get rid of war because humans are incurably aggressive.
34. Universal disarmament is the only way we can be sure of eliminating war.
35. Militarism should be abolished from the curriculum of the schools.
36. It is not in war but in peace and prosperity that our worst vices develop and grow.
37. We cannot hope to do away with war, because it is part of the unending struggle for survival in a crowded world.
38. If there is a Third World War, the United States foreign policy will have been largely to blame.
39. If armed conflict between individuals can be outlawed, it is possible to outlaw armed conflict between nations.
40. Every war shows cowardice, murder, arson, graft, and leaves a trail of personal and national demoralization.
41. The United States can be depended upon never to start a war.
42. The most frequent cause of war is the rivalry of nations for possession of territory, markets, and spheres of influence.
43. There is no conceivable justification for war.
44. Military training is imperative, but it should be voluntary.
45. We should not try to make any disarmament agreement with the Russians because they are not to be trusted.
46. Nations should agree not to intervene with military force in purely commercial or financial disputes.
47. The United Nations is a waste of time and money.
48. Peace and war are both essential to progress.

49. The abolition of war would mean effeminacy, softness, and degeneracy.
50. Wars should be fought in order to free oppressed nations.
51. The American people have become afraid of war.
52. Communist China should be admitted to the United Nations.
53. Election of a Democratic president has reduced our chances of staying at peace.
54. A host of young men entered the war in a spirit of idealism and unselfish devotion to a great cause, only to return disillusioned and cynical as to the value of ideals.
55. Compulsory military training should be established in all countries.
56. Pugnacity, rivalry and self-interest are natural, but need not result in war any more than human desire for dominance need result in slavery.
57. We should stand behind the present administration, no matter what decisions are made or how we feel toward those decisions.
58. It would be better to have Communism take over the world than to have a nuclear war.
59. If we are to survive, every American family must have a bomb shelter and know how to live in it.
60. The United States is the most powerful nation on earth.

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