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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

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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

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ACKNOWLEDGMENTS

The author wishes to express his gratitude to those who have assisted in the design and execution of this investigation. He wishes especially to thank Dr. Charles F. Wrigley for his help in the design of this study, Dr. Alfred G. Dietze for his patience and generous assistance in the preparation of this manuscript, and Dr. John R. Hurley and Dr. William T. Stellwagen for the time and constructive criticism which they offered. In addition, the author wishes to thank the Michigan State University Computer Laboratory for the use of their facilities.

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

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AN ABSTRACT

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ABSTRACT

The problem with which the present research was concerned resulted from a study of Lingoes 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 Alfred N. Dietze
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

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

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.

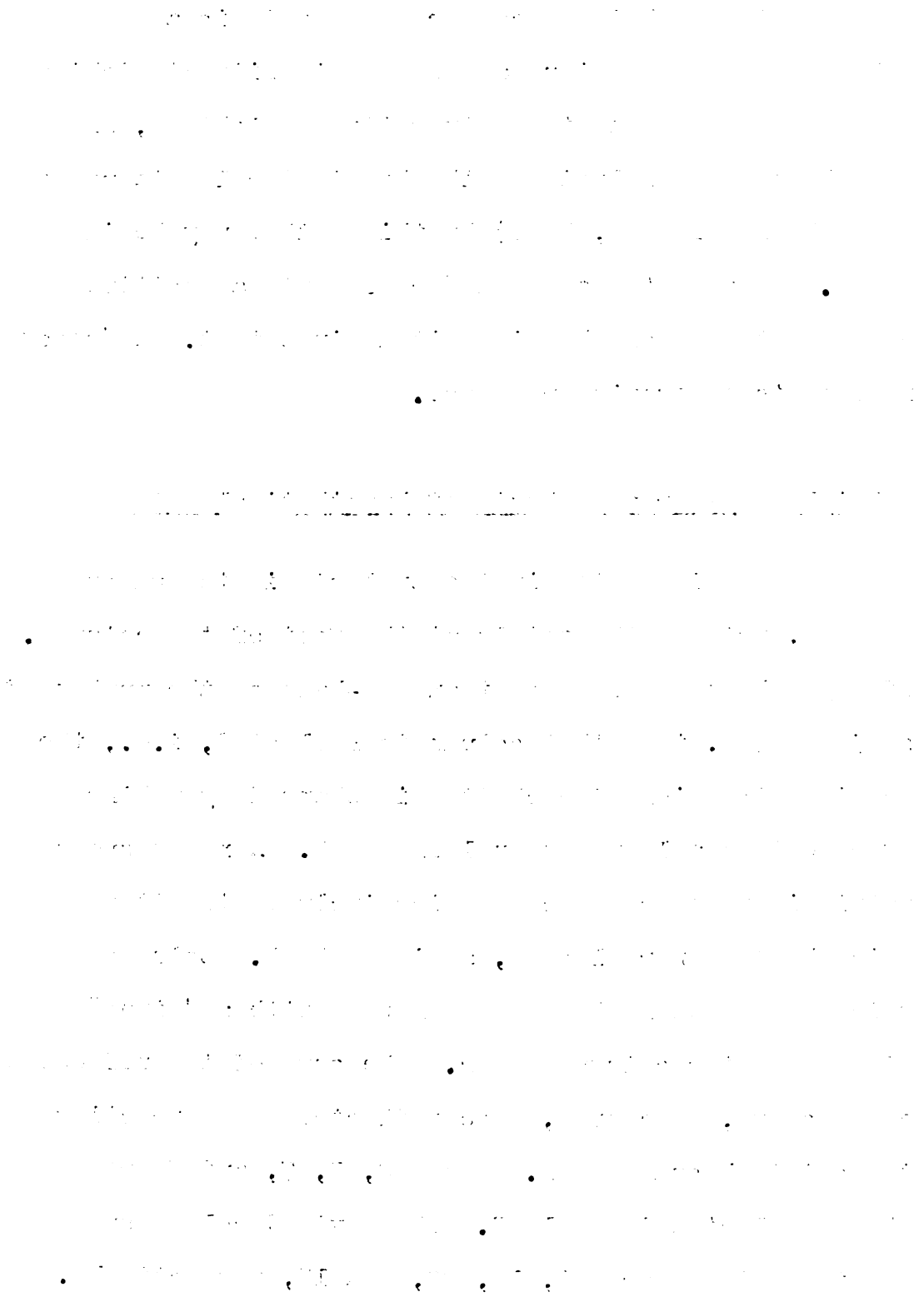
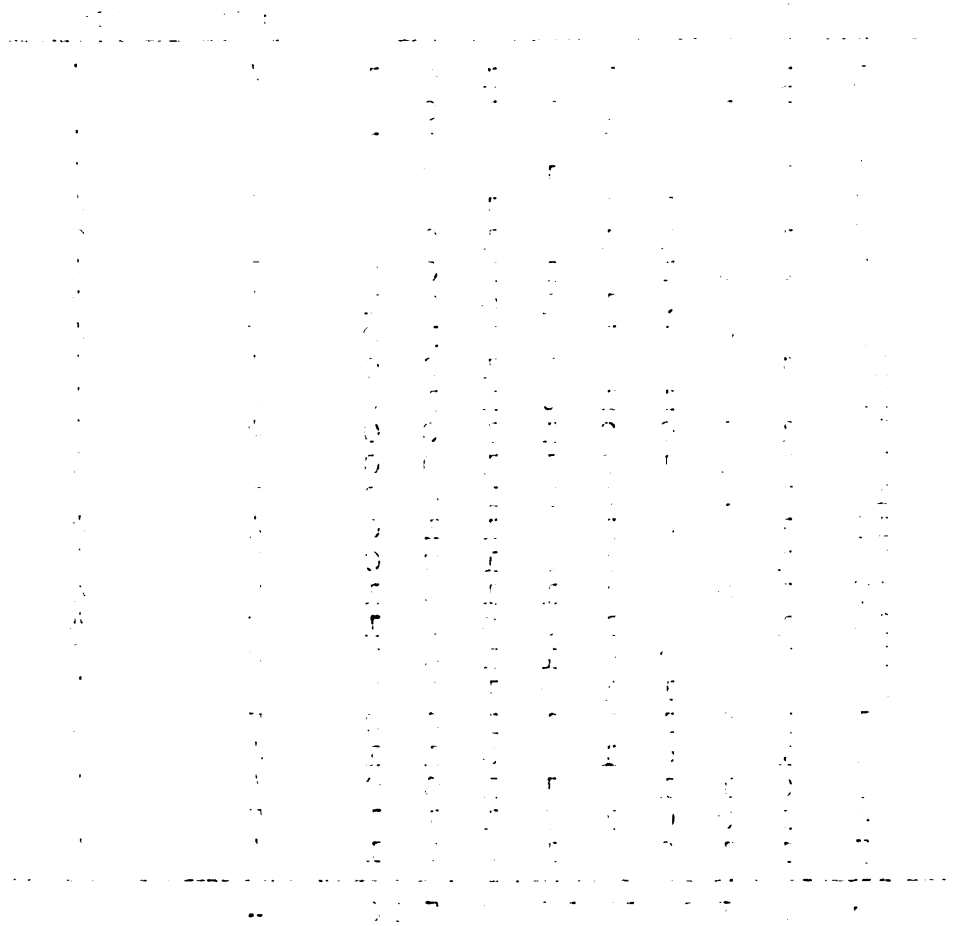


Table 2

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



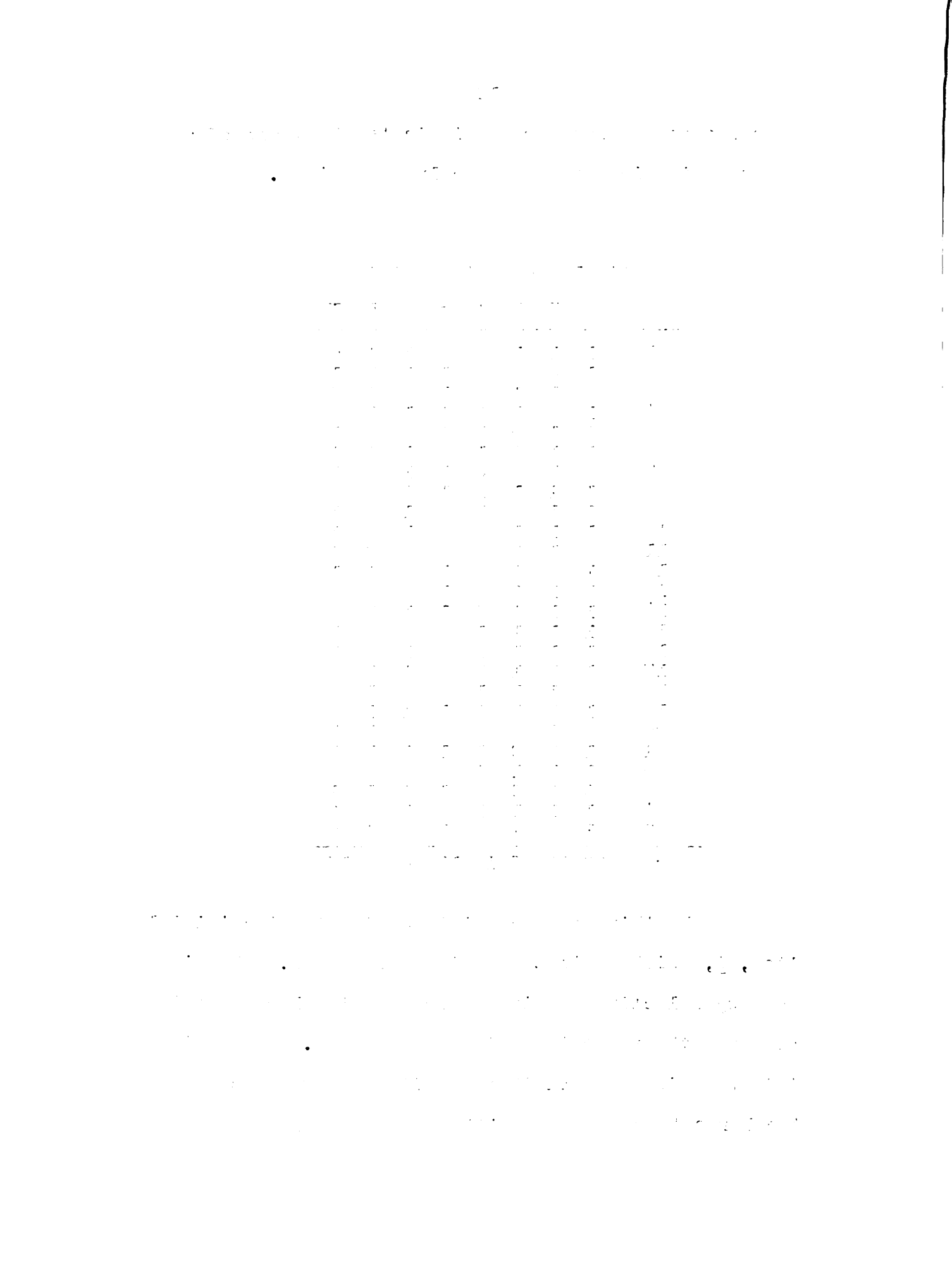
been reflected should be so indicated by means of a "minus" sign in the row and column headings.

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, $\underline{i}$, 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



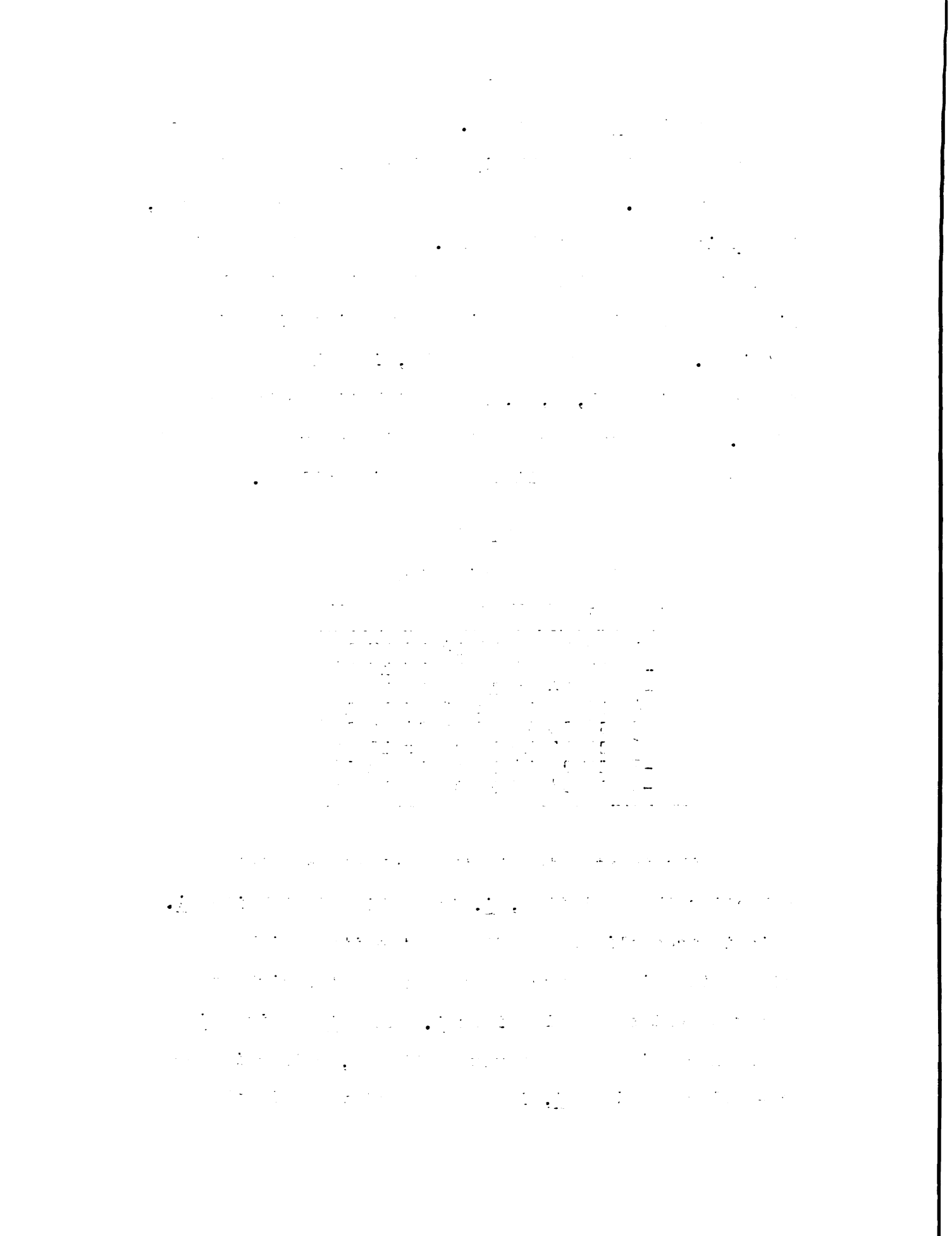
item sets with ps less than .5 have been reflected is the one which is most likely to include other sets as proper subsets. In the case of ties among column sums, item i is selected arbitrarily. The effect of making an arbitrary decision in this matter is merely that a different ordering of both items 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	$\bar{2}$	$\bar{3}$	4	5	6	$\bar{7}$	$\bar{8}$
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, j, to be linked with item i. This is accomplished by finding the item which has either the highest agreement score or the highest disagreement score with item i. Item i and item j are then placed in a new matrix (Table 5), reflecting or re-reflecting item j, if the largest value in the



*i*th column is the disagreement score. A "plus" sign is placed over the item number in Table 5 if a re-reflection has occured. After item *j* has been linked with item *i*, the next item *j* is linked with the previous item *j*. 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 $\left[\frac{\Sigma e_m}{nm} - \frac{\Sigma e_{m-1}}{n(m-1)} \right]$ 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 j, and the previous item j, becomes item i. 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 i 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.

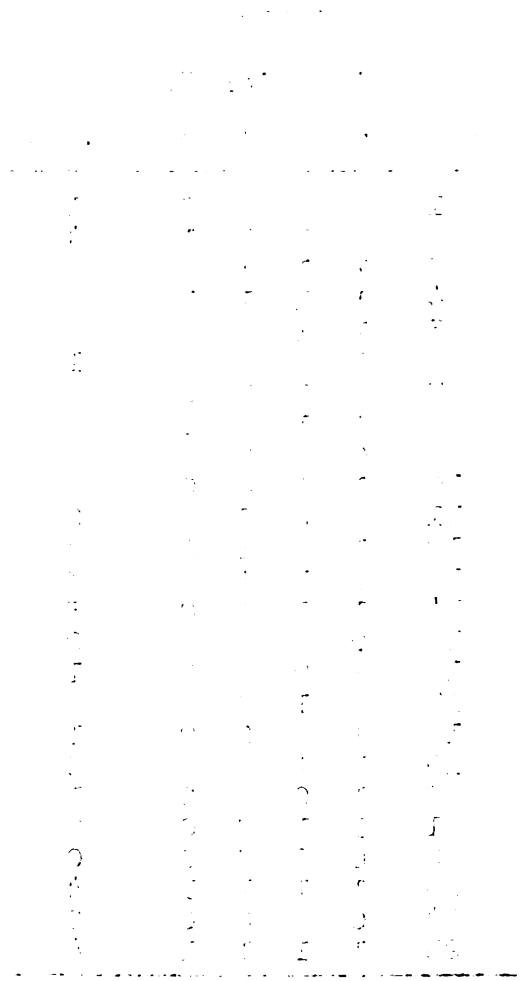
Table 5

	Item	Dimension I 1	- 3	- 8	- 6	Score
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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A third difference between scalogram analysis and the multiple scalogram method is that the latter

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.

An MSA of the responses of 100 solders 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 occuring 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.

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

questionnaire dealing with the foreign policy of the United States.[1] 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

[1]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 occuring on the basis of chance alone being approximately .06.

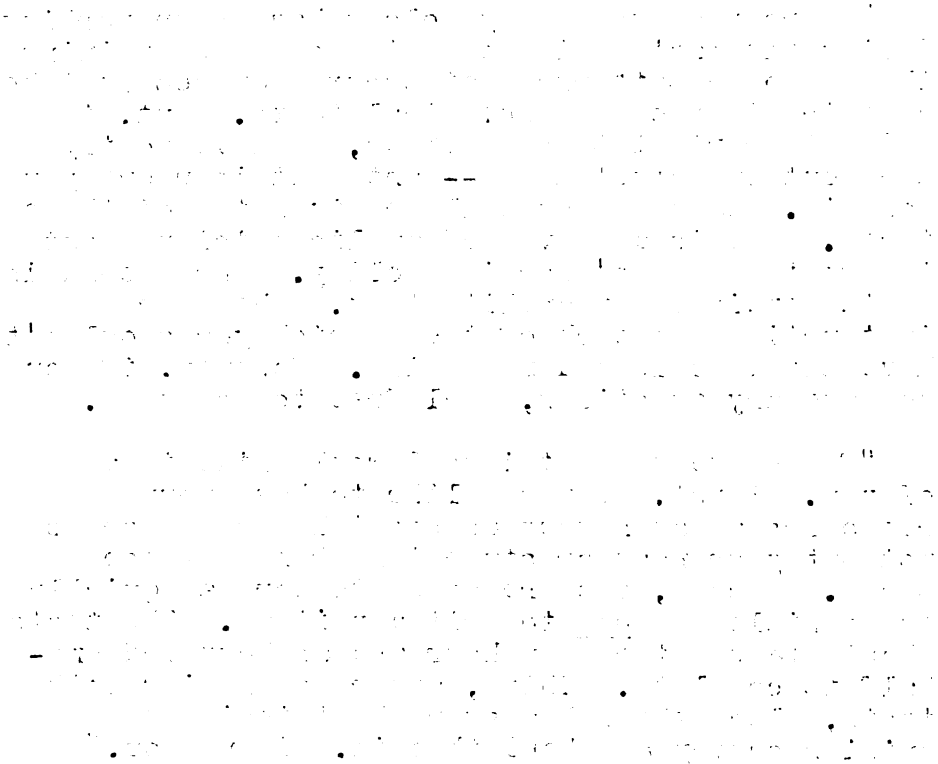
The public opinion questionnaire and the Edwards Personal Preference Schedule were administered in a group testing situation. There were three groups

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



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

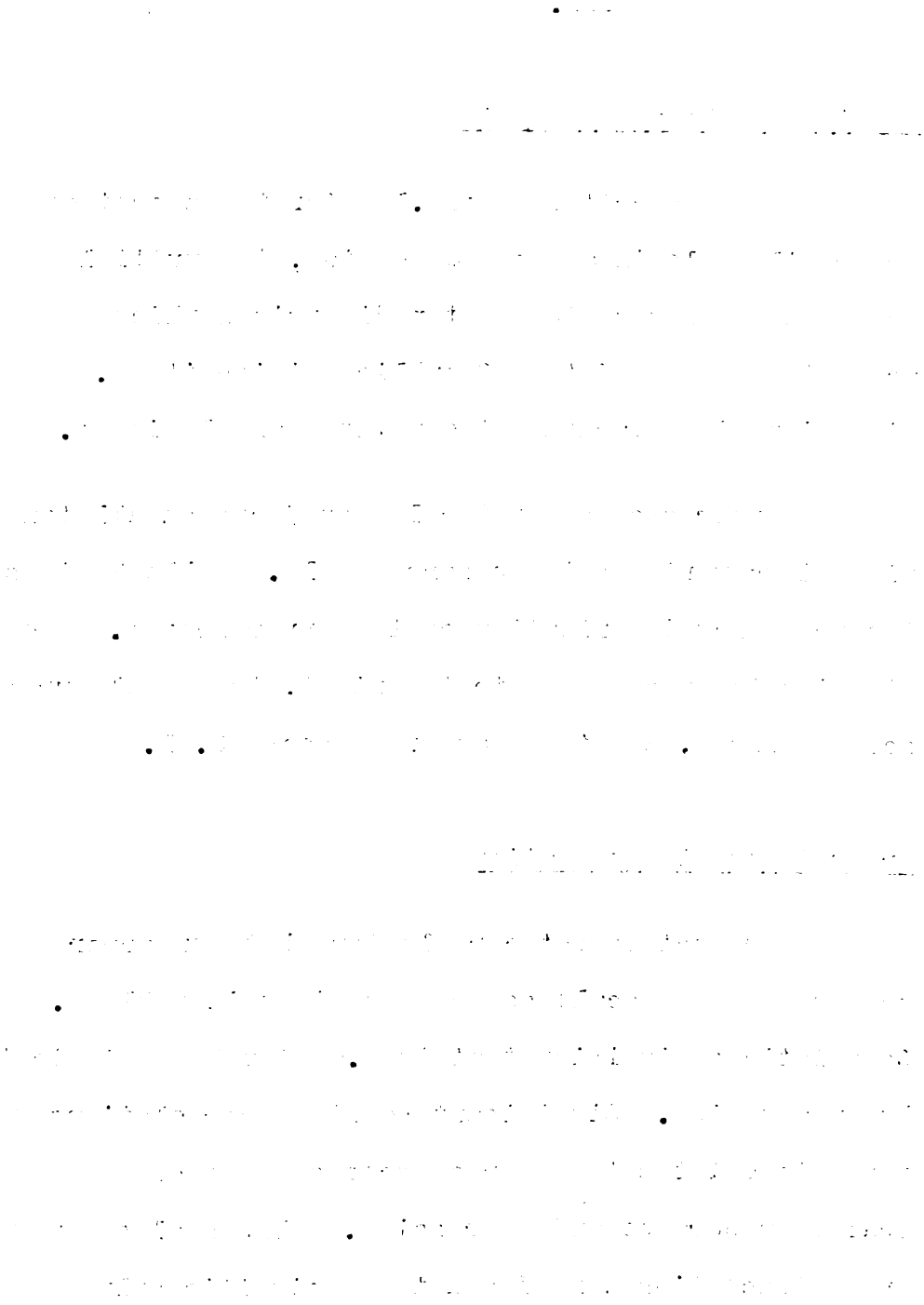
Multiple Scalogram Analysis

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



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

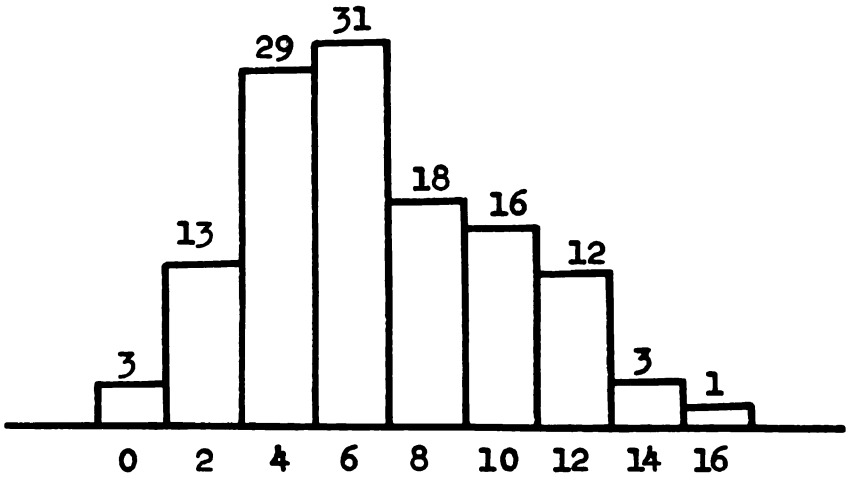
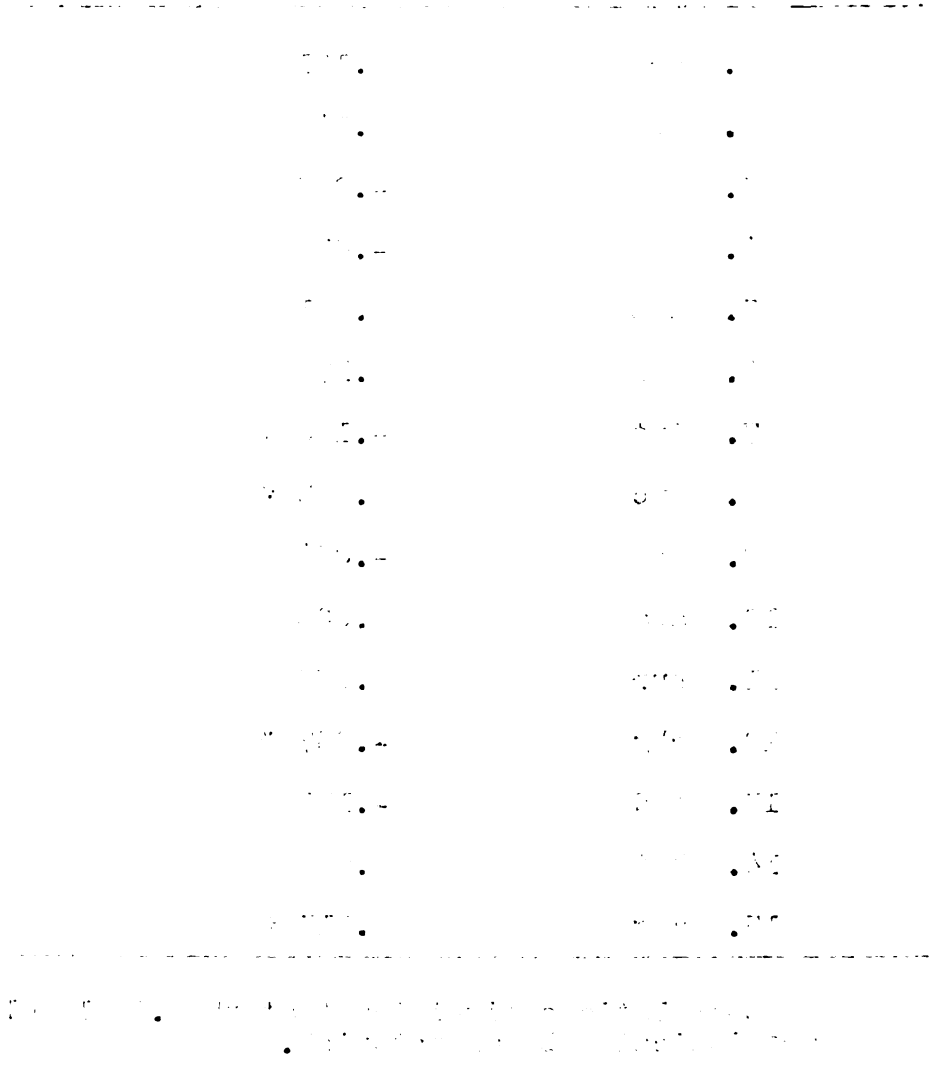


Table 8

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.



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 irratic 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 ambigious, 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 criterions 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 Variables

Aggression

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

Intraception

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

- -

Table 9--Continued

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. Interprete 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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