EFFECT OF INSTRUCTION WORDING ON THE TRANSITIVITY OF COMPARATIVE JUDGMENTS

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EFFECT OF INSTRUCTION WORDING ON THE TRANSITIVITY OF COMPARATIVE JUDGMENTS

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PREFACE

Psychologists have long been concerned with speculation and guesswork in their research. The endeavors of the psychological researcher are pointed toward an ultimate, concrete method of studying behavior; a method which will yield reliable results in predicting and controlling behavior. It is the authors' conviction that any contribution to the field, within the bounds of proper research procedure, is destined to influence the whole. Therefore, it is hoped that the following study will in time be regarded as at least a particle in the wheel of progress.

For the scaling of psychological data presently, the method of paired comparisons appears to offer the greatest promise. The following study employs this technique and is concerned with determining the influence of variation in instruction wording upon the transitivity of comparative judgments. This study represents only one phase of a much larger project being conducted at Oklahoma State University, aimed at developing reliable scaling techniques.

Deepest and most sincere gratitude and appreciation are extended to Dr. W. W. Rambo for his most valuable guidance and assistance in the formation and cultivation of this study. Also, indebtedness in acknowledged to Dr. Robert W. Scofield and Dr. H. K. Brobst for their worthy counsel.

TABLE OF CONTENTS

LIST OF TABLES

Table

EFFECT OF INSTRUCTION WORDING ON THE TRANSITIVITY OF COMPARATIVE JUDGMENTS

The method of paired comparisons is a method which requires an observer to make a judgment of a given set of stimuli, pairing each stimulus in the group with every other stimulus in the group. The observer makes his judgment in terms of some defined variable. For example, light to be judged for brightness, sounds for loudness or as in the present study, nationality groups for social acceptability. The method requires that each stimulus be compared with every other, and this is equivalent to making each stimulus in turn the standard.

In order to conduct an experiment employing the method of paired comparisons there are certain conditions which should be fulfilled. First, a fairly large range of stimulus magnitude is desirable. Second, in order to control for the space error, the sequence of pairs should be in a prearranged scheme allowing each stimulus to appear equally often on the right and left side. No stimulus should be given in two successive pairs, and finally, the careful wording of instructions and the choice of a population should observe the usual requirements for good experimentation.

The data collected from the paired comparisons study is normally plotted in the form of a proportion matrix. It is from this matrix that we seek to give each stimulus a single value on a linear scale. There are two methods by which we may develop the porportion matrix. First, a single observer may judge all pairs a given number of times on different occasions.

This procedure yields an occasion matrix. Second, we may have a number of observers judge the pairs only once, which produces an individual matrix. In the present study we are concerned with the latter method.

Transitivity is a term used to denote the set of relationships A is greater than B, and B is greater than C, therefore A is greater than C. When this term is applied to judgment data we find these relationships are affected by such factors as the dimensionality of the stimulus series being judged, the distance between the stimuli, and the mental set with which the subject approaches the task of judging. The investigator encounters serious interpretation difficulties where transitivity is frequently violated. This is especially true in applied situations in which attitude statements or other complex social stimuli are scaled. Here, the investigator frequently does not have information available which permits him to disentanble the stimulus and subject variables which possibly contribute to the transitivity of the judgments. Many of the most frequently used techniques for psychological scaling do not permit a test of transitivity, they force this property on the data. For example, with ranking data when A is greater than B, and B is greater than C, then A is greater than C is implied and not established empirically. However, the method of paired comparisons does allow a test of these judgment relationships since every possible comparison of paired stimuli is made by the subject. One variable which conceivably relates to the transitivity of judgments is the wording of the instructional material presented to the subject. In the method of paired comparisons, the instructions may be considered as serving as a background or reference variable against which comparative judgments are expressed. Therefore, in situations in which judgments denote preference, the instructions generally dictate the intensity of pre-

ference indicated by each judgment. By modifying the preference intensity expressed by each judgment it is conceivable that the dimensionality of the stimulus series, the distance between stimuli, or the subjects' general approach to the judgment task is significantly modified.

Hill (1953) in a study similar to the present investigation, found that the discriminal ability of two sets of observers did not account for a noted difference in consistency. Hill's method for achieving his results was as follows: Three sets of objects to be judged by paired comparisons were submitted to two experimental groups. Two of these sets were composed of attitude statements concerning the participation of the U. S. in the Korean conflict. The third set of objects consisted of the names of nine occupations having professional status. The attitude items had been scaled previously by the method of Equal Appearing Intervals. On the basis of these scale values, a set of nine attitude items was selected so that the entire attitude continuum, from highly unfavorable to highly favorable, was represented. A second set of seven attitude items was selected to represent only the favorable portion of the attitude continuum.

Set I of the attitude items (nine statements) and the set of occupational titles were presented to the 1st experimental group (N=78). The attitude items were judged concerning the degree to which they indicated favorably toward the U. S. participation in the Korean conflict. The Occupational titles were judged concerning the degree of prestige each was accorded in American society. A second experimental group (N=94) judged Set II of the attitude items (seven favorable statements) as well as the occupational titles. This group received the same instructions as the first experimental group.

Scale values were computed for the three sets of objects judged. In

addition a coefficient, zeta, was computed for each set of judgments obtained. This required the computation of two coefficients for each judge indicating his consistency in comparing (a) the occupational titles, and (b) one of the two sets of attitude items. Hill's analysis supported previous findings that the greater the psychological difference between objects, the less likely those objects are to be judged inconsistently. And further, that individuals who judge one set of objects inconsistently tend to judge a second set of objects inconsistently.

The purpose of this study is to determine the influence of variations in the instruction wording upon the transitivity of paired comparison judgments. Instructions will be considered as a background variable against which judgments are made, and will be varied along a social distance dimension.

PROCEDURE

Thirty white undergraduate students served as subjects for this experiment. Thirteen of the subjects were male students, the remaining seventeen subjects were female. All subjects were under twenty-five years of age. The subjects were randomly assigned to three groups, ten subjects composing a group, and each group was presented with ninety-one paired combinations of the names of fourteen nationality groups. The instructions were for the subjects in each group to select one of each pair that they felt was most preferred by the average college student. The intensity of preference was defined in terms of social distance and for each of the three groups a different social distance statement was used in the instructions. For group A the preference was defined in terms of the desirability of these nationality groups as classmates. Group B's instructions were to indicate their preference in terms of the desirability of these nationality groups as members of social and fraternal groups and group C indicated their preference with regard to desirability as dormitory roommates. Data was collected in groups with all groups receiving identical treatment with the exception of the previously mentioned differences in instructions.

Following is a list of the nationality group names used in the present investigation: Swedes, Scotch, Irish, French, Danes, Germans, French Canadians, Scotch Irish, Dutch, Poles, Italians, Finns, Norwegians and Welsh.

Each name was paired with every other name, thus yielding 91 pairs. The subjects were asked to underline the most desirable group in terms of their respective instructions.

Subjects were tested in groups, and in each experimental room a monitor read the instructions after which he distributed pencils and a pack of ninety-one cards which were ordered in a random sequence. On each of the ninety-one cards was printed the names of two nationality groups with no two cards being identical. In all there were fourteen nationality groups paired N(N-1)/2 times. Instructions were identical except for one short phrase in each set of instructions. For group A the preference was defined in terms of the desirability of the nationality groups as classmates. For group B as members of social and fraternal groups and for group C as dormitory roommates. The instructions indicated that the subjects were to underline the preferred nationality group name. All subjects remained in the room until each person had finished the task.

The second major step was the preparation of the data for statistical analysis. This was done by preparing a proportion matrix for each individual, an F matrix and a Z matrix. Both, correlational and consistency values were computed from the data.

RESULTS AND DISCUSSION

The judgments obtained from this study were analyzed in order to determine the number of circular triads found in each individual judgment matrix. The term circular triad is used by Kendall (1948) to refer to a violation of transitivity in judgment data. Table I summerizes the results of this analysis; here the mean number of inconsistent judgments and the range is presented for each group. A single classification analysis of variance performed on this data yielded a non significant F at the .05 level of significance, thus indicating that the mean number of circular triads did not vary significantly among the three instruction conditions. Furthermore, when each individual judgment matrix was analyzed using a consistency test developed by Kendall (1948) it was found that none of these matrices contained as many violations of transitivity as would be necessary to reject the hypothesis that chance factors alone were producing these inconsistent judgments. Reference to Table I will indicate that twenty-four circular triads were the maximum observed for any one subject, and with fourteen stimuli the maximum number possible is 112.

Torgerson (1958) points out that transitivity is a pertinent test of the unidimensionality of judgments. Hence, in the light of the preceding analysis it would appear that the judgment data presents some support for the satisfaction of the transitivity requirements of a unidimensional scale. Furthermore, it appears that modification in the intensity of pre-

Table I

Means and Ranges Obtained from Circular Triad Data

Group	Means	Range
A	10.7	0-24
B	12.4	1-21
C	9.4	0-24

ference ascribed to the judgments by the instructions does not significantly alter this judgment characteristic which enters so importantly in the interpretation of scale data.

Since the circular triad data is derived from the internal characteristics of a judgment matrix, the above results do not necessarily imply that the scales obtained from the three groups will intercorrelate highly. It is quite possible to have groups of subjects who are all fairly consistent in making judgments and still have scales which do not correlate strongly.

Scale values were computed for each group. The average scale intercorrelation was .62, with a range of coefficients from .58 to .63. This finding is not completely in agreement with the results of an unpublished study by Eggan, cited by Gulliksen (1946). This study reports rho values ranging from .97 to .99 for five sets of paired comparison scale values obtained under five instruction wording conditions which varied in terms of social distance. Gulliksen cites these results not as being crucial to the support of paired comparisons as a measurement procedure, but as a demonstration of the generality and utility of paired comparison scale data. The results of this present study indicate that rather serious alterations in scale values accompanied modifications in instruction wording.

SUMMARY

Thirty white undergraduate subjects, 13 male and 17 female, paired compared 14 paired nationality group names. The thirty subjects were randomly assigned to three groups of ten. Instructions directed them to select the preferred member of each pair of nationality group names. The instructions for each group defined preference in terms of social distance statements. The collected judgments data were analyzed in order to determine the number of transitivity violations observed under the three instruction conditions.. The results indicated that there were no significant differences noted among the three groups. Scale values obtained from the three judgment conditions yielded an average inter-correlation of .62.

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APPENDIX

INSTRUCTIONS

Group A

In this study we are concerned with people's attitudes toward other groups. On each of the cards you have in front of you appears the names of two nationality groups. Go through these cards in the order in which they appear and underline that nationality group which you feel most college students would prefer to have as dormitory roommates.

After you have finished one card turn it over in front of you and go immediately to the next. Work as rapidly as you can and do not spend too much time on any one card. Make sure your underlining is clear and DO NOT ERASE, once you have made a choice go right on and consider the next card.

After you have started working on the cards I will give you a short questionnaire and answer sheet. Do not look at this questionnaire until after you have finished with the cards. When you have completed the cards read the instructions on the questionnaire answer sheet and start in on the questionnaire. When finished, place the cards and questionnaire material together, put the rubber band around them and return them to me.

Do not put your name on the cards or the answer sheet. We are not interested in identifying you as an individual. Remember, underline that nationality group which you feel most college students would prefer to

have as dormitory roommates.

Are there any questions? ..... Begin!

Note to experimenter: Make sure your group does not look at the questionnaire before they complete the cards.

Group B

In this study we are concerned with people's attitudes toward other groups. On each of the cards you have in front of you appears the names of two nationality groups. Go through these cards in the order in which they appear and underline that nationality group which you feel most college students would prefer to have as members of their social group.

After you have finished one card turn it over in front of you and go immediately to the next. Work as rapidly as you can and do not spend too much time on any one card. Make sure your underlining is clear and DO NOT ERASE, once you have made a choice go right on and consider the next card.

After you have started working on the cards I will give you a short questionnaire and answer sheet. Do not look at this questionnaire until after you have finished with the cards. When you have completed the cards read the instructions on the questionnaire answer sheet and start in on the questionnaire. When finished, place the cards and questionnaire material together, put the rubber band around them and return them to me.

Do not put your name on the cards or the answer sheet. We are not interested in identifying you as an individual. Remember, underline that nationality group which you feel most college students would prefer to have as members of their social group.

Are there any questions? .....Begin!

Note to experimenter: Make sure your group does not look at the questionnaire before they complete the cards.

Group C

In this study we are concerned with people's attitudes toward other groups. On each of the cards you have in front of you appears the names of two nationality groups. Go through these cards in the order in which they appear and underline that nationality group which you feel most college students would prefer to have as classmates.

After you have finished one card turn it over in front of you and go immediately to the next. Work as rapidly as you can and do not spend too much time on any one card. Make sure your underlining is clear and DO NOT ERASE, once you have made a choice go right on and consider the next card.

After you have started working on the cards I will give you a short questionnaire and answer sheet. Do not look at this questionnaire until after you have finished with the cards. When you have completed the cards read the instructions on the questionnaire answer sheet and start in on the questionnaire. When finished, place the cards and questionnaire material together, put the rubber band around them and return them to me.

Do not put your name on the cards or the answer sheet. We are not interested in identifying you as an individual. Remember, underline that nationality group which you feel most college students would prefer to have as classmates.

Are there any questions? ..... Begin!

Note to experimenter: Make sure your group does not look at the questionnaire before they complete the cards.

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