
A Comparison of Two Techniques for Measuring Sociometric Status Among Nursery School Children¹

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The purpose of the present study was to develop a sociometric test for use with children of preschool age. The basic difference between the techniques used in the present study and those suggested in the more recent literature is in the assumption upon which the design of the tests is based. Accepting Baldwin's (1955) conceptualization of the interaction of love, hate and fear, one can say that the desire to approach or be near another person and the desire to benefit another person are motives which prompt the behavior that we recognize as indicative of friendship. The individual who instigates these motives in another person possesses social value for that person. In a sociometric study, the measure of either or both of these types of behavior could provide an indication of the social value of each individual in the particular group being studied. Northway (1951:41) has stated:

Indeed anyone who fulfills a need or enriches the experience of another individual on any basis whatsoever possesses social value and forms a part of the structure that becomes in its totality the great society.

Many of the reported sociometric tests, developed for use with children of preschool age, have been based on the assumption that an individual wants to be near a person he likes. These tests take the form of asking the child with whom he would like to do certain activities. Northway (1951) has made specific recommendations for this type of test. However, few sociometric tests have been based on the assumption that an individual wants to benefit a person he likes. Such a test was developed by Hagman (1933). Small celluloid toys were used as gifts; and each child was asked to choose the children to whom the toys should be given.

¹This study is part of a larger research project supported by the Oklahoma State University Research Foundation (State Project 128). The writer wishes to express her appreciation to Miss Peggy Azbill for her help in gathering the data for this study.

The tests developed for the present study are similar to the test developed by Hagman. The advantages of this type of test are included, in the present paper, in a discussion of the requirements of the sociometric test as presented by Lindzey and Borgatta (1954).

In many of the sociometric studies of young children, attempts have been made to relate the children's choices to observed group behavior or to teacher judgments of social acceptance (e.g., Biehler, 1954; Hagman, 1933; Koch, 1933; Lippitt, 1941; McCandless and Marshall, 1957; Moreno, 1942). Such relationships may or may not exist in a given situation; and in either case, the findings could be of definite significance in the study of personality development. However, neither observed group behavior nor teacher judgments can be justified as criteria for the validity of sociometric scores. The fact that a child may state in all honesty that he wishes to be with another child in no way implies that this is his usual pattern of behavior. The truth may be that he is never with that particular child. In other words, observations of group behavior cannot be expected to reveal the social value of one child for another. Similarly, teacher judgments of social acceptance, which are necessarily based on observations of group behavior, cannot be expected to reveal the social value of one child for another. In the present study, no attempt is made to relate sociometric status to observed group behavior or to teacher judgments.

Subjects

The subjects in this study were eleven children enrolled in the nursery school at Oklahoma State University. There were four boys and seven girls in the group. The age range was from three years, eight months to five years, six months. Initially, there were twelve children in the group, but one child withdrew from nursery school before the study was completed.

Procedure

A paired-comparisons sociometric test was administered to the children after they had been in nursery school together for two weeks. One week later a three-choice sociometric test, which was more easily administered than the first test, was given to the same children. For both tests, raw scores were converted into rank order scores. The paired-comparisons test was then used as the criterion of validity in a study of three different scoring methods for the three-choice sociometric test.

The Paired-Comparisons Sociometric Test

In a paired-comparisons sociometric test, the subject makes a choice in the case of each of all possible pairs of children in the group. In the present test, pictures of the individual children were arranged in pairs and were shown to the subject, one pair at a time. The subject identified the children in the pair, thereby showing that he knew them. He was then handed a small gift and was asked to choose one of the two children to whom to give the gift. The subject then placed the gift in an envelope designated as belonging to the child he had chosen.

For the administration of this test, the subject was taken from the nursery school group in order that he have privacy while making his choices and while giving the gifts. A total of 45 choices was made by each subject.

Pictures of the children. The pictures of the children were mounted in pairs on separate sheets of black construction paper, one picture beside

the other . Thus, when a pair of pictures was shown to the subject, one picture was on the right and the other was on the left. There was the possibility that the position of a child's picture might influence the subject's choice; therefore, insofar as was possible, each child's picture was placed half the time on the right and half the time on the left in the pairs in which it appeared. There was also the possibility that the appearance of a particular child's picture in two consecutive pairs might influence the subject's choice; therefore, the sequence in which the pairs were presented to the subject was prearranged so that no child's picture would appear in two consecutive pairs. (This plan was partially disrupted when one child withdrew from the nursery school after the initiation of the study.) The same sequence for presentation of the pictures was maintained for all subjects, but the pairs were rotated so that no pictures appeared consistently at the beginning or at the end of the sequence.

The gifts. The gifts, small picture cards, were pieces of colored construction paper, approximately 2" x 3" in size, on which picture seals of animals, flowers, etc., had been pasted. The packet of picture cards which any one child used as gifts consisted of a variety of colors and pictures, no two cards being alike. This variety made it possible for the subject to give several picture cards to one child without any duplication of gifts.

Scoring. A raw score was obtained for each child by totaling the number of times that he was chosen by the other children. These raw scores were then converted into rank order scores which indicated the position of each child relative to the other children in the group. These rank order scores were then used in a comparative study of this test and a three-choice sociometric test administered to the same children.

The Three-Choice Sociometric Test

The three-choice sociometric test was similar to the paired-comparisons sociometric test. Pictures of the individual children were used to define the limits of the group; and the subject chose children to whom he wanted to give small gifts. For the administration of the test, the subject was taken from the nursery school group in order that he have privacy while making his choices and while giving the gifts.

The three-choice sociometric test was shorter and more easily administered than the paired-comparisons test. In the three-choice test, a picture of each child in the group was handed to the subject, one at a time, and he was asked to name the child. When all the children had been named and the pictures were spread on the table before the subject, he was handed a small gift (a picture card) to give to a child of his choice. The subject made his choice and then placed the gift on the picture of the child he had chosen. In a similar manner he made two more choices. The three gifts were identical in order that any tendency to give all three gifts to one child be avoided. In this way, a first, second and third choice was recorded for each subject.

Scoring. Three different scoring methods were used. (1) In the first method of scoring, the three choices were considered of unequal value. A child was given three points for each time that he was the first choice of another child, two points for each time that he was the second choice, and one point for each time that he was the third choice. (2) In the second method of scoring, the first choice was considered to be of greater value than the later choices. A child was given two points for each time that he was the first choice of another child, and he was given one point for every other time he was chosen. (3) In the third method of scoring, the three choices were considered of equal value. A child was given one point for each time that he was chosen by another child.

For each of these methods, a raw score was obtained for each child by totaling the number of points that he received. These raw scores were then converted into rank order scores for use in the comparative study of this test and the paired-comparisons test.

Requirements of a Sociometric Test

The requirements of a sociometric test have been clearly stated by Lindzey and Borgatta (1954). Here, the ways in which these requirements have been satisfied are discussed.

1. The limits of the group which is being studied should be indicated to the subjects.

To satisfy this requirement in the present tests, an individual picture of every child in the group was shown to the subject. In this way it was possible to determine that the subject knew all the children and to be certain that he did not have to rely on his memory of the group membership when making his choices. This method has been used by other investigators (Biehler, 1954; McCandless and Marshall, 1957).

2. Each subject should have an unlimited number of choices or rejections.

When a method of paired-comparisons is used, the subject has equal opportunity to choose or reject every member of the group; he must make a choice in the case of each of all possible pairs of children, and each choice necessarily involves the selection of one child and the rejection of the other.

Gullford (1936) suggested that, because of the rigor of the method of paired-comparisons, it be used as a criterion of validity for other psychological scaling methods. On the other hand, in the studies by Koch (1933) and Lippitt (1941), the children tended to choose the last of two names presented to them; and because of this, the use of the paired-comparisons technique with children of preschool age has been questioned (Biehler, 1954).

In the present study a paired-comparisons test was used. Pictures of the individual children were arranged in pairs, one picture beside the other; and these pairs were shown to each subject. In view of the findings of previous research, it was considered possible that the position of a child's picture, i.e., on the right or on the left in the pair, might influence the subject's choice. However, there was no statistical evidence to indicate the existence of such an influence. There was no significant difference between the rank order scores for the children when their pictures appeared on the right in each pair and the rank order scores for the children when their pictures appeared on the left in each pair ($\rho = +0.627$; $p < 0.05$). For this analysis, raw scores were obtained by dividing the number of times a child was chosen when his picture appeared on the right (left), by the total number of times that he *might* have been chosen when his picture appeared on the right (left). These raw scores were then converted into rank order scores. The results of this analysis indicate that the paired-comparisons test, designed for the present study, is satisfactory for use with children of preschool age.

The paired-comparisons test used in the present study was accepted as sufficiently rigorous to serve as a criterion of validity for the three-choice sociometric test administered to the same children.

3. The subjects should indicate their choices and rejections in terms of specific criteria.

In the present study, in which the emphasis was on the child's desire to benefit another child, small colorful picture cards were used as gifts and the children were asked to choose to whom they wanted to give the cards. This was a concrete situation which the children could easily understand.

4. The results of a sociometric test should be used.

The validity of any sociometric test depends on the subjects disclosing their preferences honestly. This in turn depends to a large extent upon the subjects knowing that each choice or rejection will have a direct consequence. In those tests in which the subject chooses a child with whom he wants to play, restructuring the group in order that the two children do play together is the only logical consequence of the subject's choice. In such a situation there may be a considerable delay between the act of choosing and the consequence of the act. In the sociometric tests used in the present study, the subject had a gift which he gave to another child by placing on the picture of that child or by placing it in an envelope designated as belonging to that child. The consequence of the subject's choice was immediately apparent to him.

5. Subjects should make choices privately.

With children of preschool age, the practice has been to take each child away from the group for the sociometric test. This was done in the present study. The subject's choices were then made in private; and the consequences, the giving of the gifts, also took place in private. There was no exposure of the choices unless the subject himself decided to tell the other children to whom he had given his gifts. There was no planned discussion of the privacy of the gift giving; however, one child emphatically stated that he did not want any of the other children to know to whom he had given his gifts.

In other sociometric tests in which the subject chooses children with whom he wants to play, the choices are made in private, but they are disclosed to the other children when the group is restructured on the basis of the test results. There is a real possibility that the anticipated public exposure of choices would prevent the subject from being completely honest.

6. The questions used in a sociometric test should be gauged to the level of understanding of the group.

In the present tests the act of choosing a child to whom to give a gift was sufficiently simple and concrete for all the children to understand.

In summary, it can be stated that the paired-comparisons sociometric test introduced in the present study is satisfactory for use with children of preschool age. The limits of the group can be defined adequately by using individual pictures of the children in the group. The method of paired-comparisons offers equal opportunity for the choosing and rejecting of every child in the group. The use of pictures that are presented in pairs, rather than in sequence, appears to eliminate the possibility of the position of a picture influencing the subject's choice. The test can be administered to each child individually, thereby assuring privacy. The subject's choice of another child has the immediate consequence of his giving a gift to that child, and the concrete act of giving a gift is understood by children of preschool age.

The paired-comparisons sociometric test introduced in the present

study was accepted as sufficiently rigorous to serve as a criterion of validity for the three-choice sociometric test.

Results

Three different methods of scoring the three-choice sociometric test were studied in order to determine which method provided the most accurate measure of social status for children in the nursery school group. The paired-comparisons sociometric test was used as the criterion of validity. All three methods of scoring gave results which correlated significantly with the results of the pair-comparisons test; and the 2-1-1 weighting of the raw scores gave the most accurate measure of social status for the children. The rank order scores obtained by the individual children are given in Table I.

Spearman rank order coefficients of correlation, calculated for the results of the paired-comparisons test and the results obtained by each of the three methods of scoring the three-choice test, were as follows: (1) When the 3-2-1 weighting of raw scores was used, the correlation between the three-choice test and the paired-comparisons test was significant at the .01 level ($\rho = +0.748$). (2) When the 2-1-1 weighting of raw scores was used, the correlation was also significant at the 0.01 level ($\rho = +0.830$). (3) When the raw scores were unweighted, the correlation was significant at the 0.02 level ($\rho = +0.707$).

These results indicate that the three-choice sociometric test, which is shorter and more easily administered than the paired-comparisons test, is sufficiently accurate for use with children of preschool age.

TABLE I. RANK ORDER SCORES OF INDIVIDUAL CHILDREN ON A PAIRED-COMPARISONS SOCIOMETRIC TEST AND A THREE-CHOICE SOCIOMETRIC TEST USING WEIGHTED AND UNWEIGHTED SCORES.

Child	Rank Order Scores			
	Paired-comparisons Sociometric Test	Three-choice Sociometric Test		
		Weighted Scores 3-2-1	2-1-1	Unweighted Scores
A	5.0	2.5	3.0	3.5
B	8.0	7.0	6.5	5.5
C	2.0	4.5	4.5	8.0
D	6.5	9.0	9.0	8.0
E	6.5	9.0	9.0	8.0
F	4.0	6.0	4.5	3.5
G	3.0	2.5	2.0	2.0
H	10.0	11.0	11.0	11.0
J	9.0	4.5	6.5	5.5
K	1.0	1.0	1.0	1.0
L	11.0	9.0	9.0	10.0

Summary and Conclusions

The purpose of the present study was to develop a sociometric test for use with children of preschool age. The requirements of a sociometric test, as presented by Lindzey and Borgatta (1954) were used as a guide in designing a paired-comparisons test and a three-choice test. Both of these were picture sociometric tests, and both were based on the assumption that an individual wants to benefit a person he likes. The reliability of the paired-comparisons test, as an instrument for use with young children, was determined statistically; and it was then accepted as the cri-

terion of validity in a study of the three-choice sociometric test. Rank order scores obtained with the three choice test correlated significantly with the scores obtained with the paired-comparisons test, and a 2-1-1 weighting of the raw scores gave the most accurate measure of the social status of the children.

A majority of the sociometric tests reported in the literature are based on the assumption that an individual wants to be near a person he likes. It is possible that such a test would yield results quite different from those that would be obtained by using a test based on the assumption that an individual wants to benefit a person he likes. This suggests that research is needed to determine the relative value of these two types of tests when used with young children.

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