THE RELATION OF THE
ADJUSTMENT OF THE INDIVIDUAL
TO HIS SOCIOMETRIC STATUS
IN THE CLASSROOM

by

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ABSTRACT

The relation of the adjustment of the individual to his sociometric status in the classroom. By Eleanor Irene Kay.

Since the sociometric technique was devised as a measure of inter-personal relations, many studies have been undertaken, in which the technique was used. Frequently the sociometric score of an individual or his "sociometric status" has been used to evaluate him, particularly among those not too familiar with the test. Among those interested in mental hygiene, there has been a similar tendency to consider sociometric tests as measures of adjustment. This study was undertaken in an attempt to determine whether such assumptions were justifiable.

Two Grade III and two Grade VII classes, and one large group of Grade XI students from three schools in a "middle class" area of Vancouver were used as subjects. The Sociometric Test, Form A, of the National Committee for Mental Hygiene (Canada) was administered by the writer, followed immediately by the appropriate series of the California Test of Personality, Form A.

The sociometry percentage scores were correlated with the Total Adjustment scores, and with the Self Adjustment and Social Adjustment scores for each grade. In addition, separate correlations were run between Total Adjustment scores and sociometry percentage scores for boys and for girls in each grade. The extreme groups on the sociometric test were determined for each grade and the significance
of the differences between the means on the personality test computed. Similarly personality test scores of mutual friends and non-friends on the sociometric test were compared, and the significance of differences obtained. Finally, graphs were employed to illustrate the range of sociometric scores for the well-adjusted, moderately well-adjusted and poorly adjusted groups in each grade, according to the results on the California Test of Personality.

The results obtained, without exception, indicated a lack of relationship between the adjustment of the individual and his sociometric status in the classroom. Consequently, the evaluation of an individual's adjustment on the basis of his sociometric score appears to be unjustifiable, and should be avoided.
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I STATEMENT OF THE PROBLEM

Fundamental to the concept of culture is the unit of the group. Within the main constellation, sub-groups of varying structure and composition are found. In our Western European civilization, social and political scientists have attempted by devious methods to determine such characteristics of groups as structure, degree of cohesion, cleavages and patterns of individual attraction and repulsion.

A relatively recent technique for such study is the "spontaneity test," devised by Moreno (22), the name of which was later changed to "sociometric test." By means of a simple questionnaire, it is possible to determine the members within a group with whom various individuals would prefer to associate under certain conditions. From the results obtained, numerical scores of the number of choices received by each individual, or the number of people choosing him may be calculated, and hence, the group structure with its individual isolates or stars, determined.

The "group status" of any individual within the group can be denoted numerically by means of the score he receives, or by a diagrammatic depiction of
the group, with choices represented by arrows from the chooser to the chosen.

With the growing emphasis on, and employment of sociometric techniques in group research and practical situations, numerous hypotheses have been set forth and inferences made. Basic to a clear understanding of the advantages and limitations of sociometry is the establishment of the degree of relationship between test results and various pertinent factors influencing group behavior. One of the essential and primary studies in this respect, from the point of view of the worker in mental hygiene, is the relation of sociometric status to the adjustment of the individual.

It would be presumptuous to assume without verification that any relationship found between adjustment and sociometric status would be constant, no matter what the group. However, the classroom as one of the primary and most representative of the sub-groups of our culture, is basic to any investigation in this field.

By the use of Moreno's technique, the writer examined the group structure of a few Vancouver classes which formed a sample of school pupils employed in studying the relationship of group, or sociometric status, to adjustment.
3.

Evolution of the problem: During a series of informal lectures in the field of sociometry, presented at the University of Toronto, in November, 1946, Mary L. Northway (29) delivered a lecture entitled, "A common misconception regarding sociometric scores". At that time it was emphasized that the lay public who were acquainted with sociometric techniques, for example teachers and parents, transferred the culturally defined value of prestige or popularity to sociometric scores. They concluded that it was more desirable to obtain a high sociometric score than a low one. Northway cautioned the workers in the field of the dangers of accepting such a view.

It occurred to the writer, upon reading Northway's lecture, that although the psychologically oriented individual did not place such a value upon popularity, he did value mental health or good adjustment. Therefore the question arose regarding the relationship between sociometric status and adjustment.

If such a relationship were found to exist, there would then be a psychological foundation for the commonly held view that high sociometric scores are desirable. It was therefore proposed to examine classroom groups in an attempt to determine the degree of such a relationship. At the same time a related problem was
investigated, namely the relation of mutual friendships to adjustment.

Upon further examination, another problem was recognized. It seemed hardly justifiable to assume that the relationship between sociometric status and adjustment would necessarily remain constant throughout all age levels. As a result, the field of investigation was enlarged in order to embrace those ages between which obvious physical and social changes, in the individual and the group, had been observed to take place. These periods included childhood, time of puberty, and later adolescence.

**Hypotheses:** From the evolution of the problem, the hypotheses to be tested are stated as follow:

1. That sociometric status in the classroom bears no significant relationship to adjustment, as measured by the California Test of Personality.
2. That no significant difference exists between the adjustment of mutual friends and non-friends.
3. That the lack of relationship between these sociometric measures and adjustment persists from one grade level to another.
II HISTORICAL BACKGROUND

The sociometric technique: Since the time of Moreno's (22) exposition of the sociometric approach, with the publication of "Who shall survive", workers in the social sciences have employed and expanded his techniques in their study of the many facets of group interrelations. Some, such as Schauer (34) who observed a mental hospital community, and Loomis (20) who examined the grouping in a Spanish-American village, are interested in the field because of the direct applicability of the techniques in the study of present specific problems. Others such as Bronfenbrenner (5), Criswell (9), Forsyth and Katz (10) and Moreno and Jennings (24) see the advantages of such techniques, but recognizing their statistical shortcomings, have attempted to remedy these. These statistics will be discussed under the heading of "Treatment of data".

A third group is interested in exploring the range of possibility in the use of sociometry. Examples of the extent of application in the field are seen in reports such as that of Richardson (32) on the use of the techniques in the teaching of English, or experiments carried on by Jennings (16) on the variations found in the social atom after use of the method at different times.
Clarifying the term "social atom", it may be defined as the structure of a group at a given time, and includes the interaction of the individuals within the group, cleavages, degree of cohesion, etc.

Kerstetter and Sargent (18) employed sociometric techniques in the classroom and were able, by re-seating and study groups, to incorporate an anti-social gang of five boys into the group. In the same vein, Moreno and Jennings (23) discovered that it was possible to alter group structure by training outcasts to be leaders in such situations as in the liberation of occupied areas, and suggest that this finding be put to good use in fostering the democratic way of life.

A report by Infield (15), illustrates the use of the negative side of sociometric tests in the formation of co-operative groups. He found that the most valuable information obtained from German refugees in New York, while structuring a compatible community, was a statement of those persons with whom the individuals would not like to live.

Finally, Barker (1) studied the degree of similarity found in sociometric ratings of a group of class-mates upon first inspection of each other, and after thirty-six class meetings. His results revealed that 55% chose the same seat-mates and 63% rated themselves similarly in regard to their conception of how each other member would rate them.
Studies of the factors determining sociometric status: Related specifically to the problem under consideration in this study, are numerous investigations suggesting those factors most affecting sociometric choices. In her book, "Leadership and Isolation", Jennings (17) concludes that those acceptable and non-acceptable within the group achieve such status, not because of common personality traits, but because of success or lack of success in personal interaction. This suggests that little relationships would be found between adjustment, as portrayed in personality traits, and sociometric status, but that a positive correlation between mutual friendships and adjustment is more likely. On the other hand, Cologne (8), studying a self-help community centre, found that personality traits did affect choices, but that they were secondary to the knowledge and ability of the individual in respect to likelihood of choice as co-workers on work projects.

Vreeland (36), after testing twenty-one college fraternities concluded that factors other than personality traits affected choices, for he found that stars, that is, those persons toward whom many members of the group are attracted, tended to be chosen from upper classmen, while isolates were among the newcomers to the group. However, according to Morgan (25), studying children in a war boom community, the recency of arrival in the group as such,
does not affect choices.

Examination of a group of young boys at a summer camp, by Hunt and Solomon (14) yielded the conclusion that previous camp experience, athletic ability, generosity, physical attractiveness, orderliness of activity and lack of egocentricity were significantly correlated with sociometric status. However, the relation of these factors to general adjustment was not determined. Corroborating the findings of Jennings and Cologne, in the camp setting, Northway (27) concluded that success in direct social relationships and the possession of skills were factors influencing choices among a group of girls.

In a study of twenty-three nursery school children from three to five years of age, Frankel (11) found little relationship between scores and chronological age, intelligence quotients or attendance. She discovered however, that although children who had frequent emotional outbursts and were habitually disciplinary non-conformists were more often named as play-mates, they were not chosen, in actual play situations. Two conclusions might tentatively be drawn from this finding.

a. Sociometric tests apparently do not measure the situation which actually exists within the group.

b. Nursery school children tend to make "unreal" choices for playmates.
In the grade school setting, Line and Griffin (21), in their search for recessive children, discovered that all children defined by them as "shy" were in the lowest quarter on the sociometric test, but that there were children in this quarter who were not shy. Similarly, Hill (13), in examination of the pupils falling below the average acceptability score, found that all the shy children and only two of the non-shy children were in this category. Loeb (19) revealed that those children scoring low on the sociometric test were of two types, those who were reserved and considered non-problems by their teachers, and problem children, aggressive, and actively disliked by their classmates. She discovered, in addition, a significant relationship between those children whose achievement ranked above their ability and those receiving a large number of choices on the sociometric test.

In a review of these studies in the primary schools, Northway (23) formulated the tentative hypothesis that "A child's social acceptability is related to the degree and direction of his outgoing energy".

From these Toronto studies the generalization might be made that the majority of the children with clinically defined personality and behavior disorders are among those chosen least often, by their classmates, but that, some children who appear well adjusted, although not socially active, are also in this group.
Potashin (31) reports, in a study of friends in the senior classes of an elementary school, that friends tend to be similar in height, intelligence and economic status, but that the reliability of the results is not high. She discovered two types of friendships existing within a group.

Quoting directly, they are:

1. The closed clique relationship of partners who are very much alike in social status and contacts, and who are often the most prominent members of the class.

2. The less restricted relationship of partners sharing fewer social experiences but with wider contacts elsewhere.

Bonney (3), after a study of five popular and five unpopular children from a group of 150 in the elementary schools of Denton, Texas, offers the following traits as being connected with group acceptability: physical health, and vigor, conformity and group identification, emotional stability and control, arousing admiration, social aggressiveness, adaptability and tolerance, dependability, dependence on others for assistance and emotional support, providing new experience for others, social service motivation and an attitude of good will toward others. The same writer, in a review of factors related to mutual friendships in elementary school, secondary school and college, found a small but consistent relationship between scores and
11. Socioeconomic background and a slight relationship to occupational interests at the secondary school and college levels. She employed the California Test of Personality in the elementary schools, and found little association between scores and friendship formation. In the high schools however, social and emotional development as depicted by the Bell Adjustment Inventory appeared to be significantly related to friendship scores. Since, however, different tests were used at the two levels, any conclusion reached must be evaluated in terms of the possible error incurred by this method. Bonney obtained her highest correlations in this study between scores of mutual friends, on a scale of her own design to measure the ability to win friends.

A study by Bonney (4) of grade IV pupils disclosed that sociometric scores when correlated with adjustment, as measured by the California Test of Personality, yielded a $r$ of $+.49 \pm .06$. When sociometric scores were correlated with sub-sections of the California Test, the relationships were $+.31 \pm .07$ and $+.43 \pm .06$ for Self Adjustment and Social Adjustment respectively. This relationship appears rather high in comparison to the trend of the reports cited, and perhaps may be accounted for by the fact that only one grade level was compared. Bonney herself in the reference previously cited (2) reports no significant relationship between California
scores and mutual friendships at the elementary school level.

Northway (29) found that nine shy individuals were among the twenty-four children clinically examined who had the lowest scores on sociometric tests. This lays Bonney's results open to question especially when Northway further defines "shy": "The shy child, while hesitant in social situations, especially those which put him "on the spot", had often many vital interests and seemed to enjoy life reasonably well. He had good insight and his difficulty was limited to one area, direct social participation in his classroom group". Then it would seem that, with regard to general adjustment, at least one group receiving low sociometric scores should not receive correspondingly low scores on a personality test.

The writer was unable to discover a specific study reported in the literature which illustrated a constancy or lack of constancy in the relationship between adjustment and sociometric status, throughout several age levels. Bonney's study concerning relationships of mutual friends and adjustment shows a lack of such a constant relationship, but on the other hand, in the Toronto studies of recessivism, the connection between shyness or recessivisim and classroom status apparently remained unchanged, at least from grades five to eight inclusive.
13.

In review, many writers have suggested those factors which they believe to be related to sociometric status and mutual friendships in various settings. A tendency to disprove personality factors as outstanding in their relationship is prevalent. The connection between absolute status and clinically determined degrees of maladjustment appears constant through several grade levels.
III PROCEDURE FOR COLLECTING DATA

**Sampling technique:** As was previously stated, it was proposed to investigate in this study the relationship between sociometric status and adjustment, and mutual friendships and adjustment, at varying age levels. Groups who were sufficiently well acquainted with one another to make decisions in respect to their choice of companion for different activities, were obtained from grades III, VII, and XI of three Vancouver schools. In these grades, pupils averaged eight, twelve and sixteen years respectively, which were considered representative of childhood, approximate time of puberty, and later adolescence. The common hypothesis that puberty brings on emotional disturbances in the individual, with either a physical basis or a cultural one, suggested that both group structure and adjustment might change at this time. As a result, the three levels signified periods of relative adjustment, upheaval, and adjustment once again. The groups were limited to the same section of the city in order to nullify the effect of any socioeconomic differences. Confirmation of the necessity of such a precaution is borne out in a study by Morgan (25), who discovered that social relationships among children in a war boom community were affected by the level of the father's income, although recency of arrival seemed to have little
relationship to scores.

The principals of two primary schools and one large secondary school in a middle class area were approached by the director of the Tests and Measurement Bureau of the Vancouver Board of Education. The writer in turn contacted these principals and arranged for a classroom period for the administration of a sociometric and personality test for each grade, both tests being administered in every instance by the writer.

The tests were given to one grade III and one grade VII class in each of the primary schools, and in the high school, to one group of grade XI pupils equal in numbers to two classes in the lower grades. The numbers in each class and proportion of boys and girls is given in Table I.

**TABLE I**

Number of boys and girls tested in each classroom.

<table>
<thead>
<tr>
<th>Grade</th>
<th>School</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>B&amp;G</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>Primary School I</td>
<td>14</td>
<td>18</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Primary School II</td>
<td>19</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>33</td>
<td>33</td>
<td>66</td>
</tr>
<tr>
<td>VII</td>
<td>Primary School I</td>
<td>19</td>
<td>18</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Primary School II</td>
<td>24</td>
<td>10</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>43</td>
<td>28</td>
<td>71</td>
</tr>
<tr>
<td>XI</td>
<td>Secondary School</td>
<td>36</td>
<td>43</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>112</td>
<td>104</td>
<td>216</td>
</tr>
</tbody>
</table>
A certain difficulty was encountered at the grade XI level because of the option plan of the secondary school. As the school was a large one, it was not practicable to include all of grade XI in the testing. As a result there was the problem, in choosing any two classes for testing, of some pupils being at a disadvantage. That is, one class might perhaps be the only one that a pupil attended with the other members of the class, and so that particular pupil would be almost a stranger to the others. It was decided that English classes, which were compulsory, would have fewer disadvantages of this sort, and, as a result, the pupils of such classes were employed as subjects. As a second precautionary measure, these classes were tested at the same time, in one room, and the pupils given the opportunity of choosing anyone in the room, in order to be closer to the total grade XI sample, in which theoretically, everyone would have the same opportunity of knowing the same number of people.

Measuring Instruments: The sociometric test of the National Committee for Mental Hygiene (Canada), Form A was employed, and the instructions of Northway and Potashin (30) followed. A sample of the test is given in Appendix I and the instructions in Appendix II. Although many types of questionnaire would have elicited similar responses from the pupils, and scores could have been obtained on their bases, it was considered advisable to
employ a test which had already been found useful in the classroom and had been "standardized" on a sizable number of cases.

The California Test of Personality was used as a measure of adjustment. This is a self-rating scale. To the right of the questions pertaining to the subject's activities and attitudes is printed "yes" and "no", one of which the subject is instructed to circle. The test is divided into two sections, Self Adjustment and Social Adjustment, the scores of which, when totalled, make up the Total Adjustment.

A primary consideration in selecting such a test was the age range for which it was applicable, for differences found between results in different grades could not be interpreted with any degree of assurance if more than one test of adjustment were involved. Although different levels were employed, namely the Primary, Intermediate and Secondary Series, this was considered preferable to another test, for the various levels were constructed by the same authors with the same objectives in view and the same foundation on which to build.

The matter of validity of this test is questioned by Cattell (7), in respect to interpretation of individual results by means of the sub-sections of the test, but he acknowledges the usefulness of the test in research where
group average differences are being computed. The authors, Thorpe, Clark and Tiegs (35), cite four validation criteria employed in selection of the items of the test. Quoting directly they are:

(a) Judgments of teachers and principals regarding their relative validity and significance.
(b) The reactions of pupils, expressing the extent to which they felt competent and willing to give correct responses.
(c) A study of the extent to which pupil responses and teacher appraisals agreed.
(d) A study of the relative significance of items by means of the bi-serial r technique.

The split-half reliability, corrected by the Spearman-Brown formula, and reported by the authors was as follows:

<table>
<thead>
<tr>
<th>Adjustment Type</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Adjustment</td>
<td>.922</td>
</tr>
<tr>
<td>Sec. 1 Self Adjustment</td>
<td>.893</td>
</tr>
<tr>
<td>Sec. 2 Social Adjustment</td>
<td>.873</td>
</tr>
</tbody>
</table>

Administration of Tests: The two tests were administered in the primary school grades in mid-December. It was presumed that in the three and one half months preceding this time, the children had had sufficient contact with one another to be able to choose from among their classmates, individuals as companions for various activities. The tests were given to the grade XI group after Christmas.
The sociometric test was distributed first, and the instructions of Northway and Potashin (30) followed. In Moreno's (22) studies as well as in the instructions to this test, the children were told that the results were to be used to help the school form groups for activities. While working in the camp setting, however, Northway (27) informed her subjects that they were part of a study, and the writer decided to follow the latter plan, as the school was not going to make use of the results. Consequently it was stated that they were helping in a study which was being carried on at university, and that the writer was the only person who would see their answers. They were aware that the writer was a stranger to them, and were informed that neither their classmates nor their teachers would see their papers or be told of their answers.

The California Test of Personality was distributed immediately upon completion of the Sociometric test. In the case of the grade III classes, in accordance with standard procedure, the pupils read their own test blanks while the writer read each question aloud, and then left time for the children to circle the appropriate word to the right of the question.

In all cases, rapport appeared to be quickly established, and both pupils and teachers were co-operative in their attitude and suggestions. The majority of the test items were apparently answered without hesitation on the part of the pupils.
With the grade VII classes, however, there were certain objections to some questions on the personality test on the grounds that

(a) To answer one way sounded conceited.

(b) To answer the questions regarding how other people felt about them, was impossible without consultation with others.

Nevertheless the freedom with which they asked questions of the writer indicated a lack of self consciousness, which, presumably, enabled them to take the test without inhibiting emotional tension.
IV TREATMENT OF DATA

A lack of relationship between sociometric status and adjustment, and between mutual friendships and adjustment was postulated and set forth in the hypotheses. In doing so, it was assumed that such relationships were measurable through analysis of the data derived from the tests employed. As a result the scores were analyzed in the various ways amenable to statistical interpretation, and conclusions reached on their bases.

Statistical Techniques: Two techniques were employed in measuring the degree of relationship between sociometric status and adjustment, and a further technique used to determine whether a significant relationship existed between friendships and adjustment. They consisted of the following:

a. Correlations, (Pearson r), which were computed between sociometric and adjustment scores.

b. Mean total adjustment scores calculated for the extreme groups on the sociometric test in each grade, and the significance of the difference between the extreme groups assessed.

c. Mean total adjustment scores of mutual friends compared to the means of non-friends in each grade. The significance of the difference was evaluated.

Tabulating sociometric scores: The tabulating method for the sociometric test was similar to that suggested by Northway and Potashin (36).
Appendix III illustrates a sample tabulating chart identical with the type used in this study. Down the left side of the chart were printed, in alphabetical order, the names of the choosers, and across the top of the chart the names of those chosen. The persons chosen by any individual were then tallied in the row opposite the chooser's name, and the choices received by each person were totalled by summing the tallies in the columns under the name of the chosen. Each question was tallied and totalled in a different colour of pencil, so that differentiation between questions could be made, where necessary.

It is possible to compute sociometric scores, and thus, status, in two ways, by determining the number of choices received by each individual, or the number of persons choosing him. The former method was employed, following a report by Bronfenbrenner (5).

In a study of six separate social groups, totalling 151 at the time of the administration of the first questionnaire and 133 during a later test, he discovered that,

"When the two raw scores made by each child are compared, it will be noted that the number of different persons is almost without exception smaller than the number of choices and that this difference becomes more pronounced for higher score values. It will be observed further that not only do the corresponding probabilities of chance occurrence differ, but that values in excess of chance expectancy are found far less frequently among persons scores than choice scores...Yet, paradoxically enough, the correlation between the number of choices received by each child and the number of different children by whom those choices were made was above + .95 ± .02 in three of the six groups and above + .90 in all of them....The choice thus becomes the
more sensitive indicator of social status".

No record was kept of the names of those chosen from outside of the class (permissible in question) of those absent from the class at the time of testing, as personality tests of these people were not available, and therefore relationship between their sociometric scores and adjustment could not be computed. It is interesting to note that the number of choices going outside of the group increased with age, possibly indicating the wider social contacts of the older children.

Weights assigned to the choices on the sociometric test: In her study of a summer camp group, Northway (27) assigned varying weights to the three choices, but this practice has since been attacked by Bronfenbrenner (5). He writes as follows:

"Several considerations prompted the present investigator to dispense with a weighting procedure: (1) To determine the difference in social significance between a first, second, third, etc., choice is a difficult problem, (2) The assigning of arbitrary a priori values is a questionable practice, (3) The setting up of the analogous chance situation is much complicated by the adoption of a weighting scheme. (4) In any particular problem, such as a case study, the detailed analysis of choices is in any event advisable."

As a result, it was decided to omit any weighting technique in this study.

Conversion of raw sociometric scores to percentage values: Two considerations prompted the writer to abandon the use of raw scores on the sociometric test in the computation of correlation coefficients.
The first was the differences in the number of pupils in the two classes in each of grades III and VII, which were taken as unitary grade groups in the correlations. The second was the difference in the numbers of boys and girls in some of the classes. In both cases the problem was to find a means of placing the sociometric score of each individual on a comparable basis with the scores of other members of his grade. A decided sex cleavage was noted in all classes, that is, few boys chose girls or girls, boys. Therefore it would have been a distortion of the results if a raw score of a Grade VII boy, in a class of twenty-four boys and ten girls, had been considered equal to the same score received by a girl in that class, for the total number of choices possible for the boy to receive from boys, on one question, would have been twenty-three, while the total possible for the girl to receive from girls would have been nine. The same sort of situation prevailed with the two classes of the one grade. It was therefore decided to calculate percentage scores. The means of determining these percentage scores was as follows:

1. Ascertaining the number of boys filling in the sociometric test form in the classroom.

2. Compute the largest possible number of choices any boy could receive from the boys in his class, i.e. \(4(N-1)\), when there are four questions on the form.
3. Compute on a percentage basis, the actual number of choices received in relation to the number possible.

4. Determine percentage scores for the girls similarly, and for the other classes.

It was recognized that the results would not be wholly accurate, as a few boys received choices from girls, and girls from boys, but the inter-sex choices were so scattered and few that it was assumed that these would have no appreciable effect upon the results.

Review of available data: Before undertaking a more detailed individual study of the technique employed in the analysis of the data, it seems advisable, in order to clarify the situation to review the sources of information at the disposal of the writer.

Percentage sociometric scores were available for each individual in the three grades. The significantly high and low scores in each group (.02 level of confidence) were separated for comparison with respect to adjustment.

Individuals having mutual friends were separated from non-friends in order to compare adjustment scores. Finally, Total Adjustment scores on the California Test of Personality were available for each person, as well as Self Adjustment scores and Social Adjustment scores.
Correlation of sociometric status and adjustment: When the percentage scores had been computed, all the persons in the grade were grouped as a whole, and a correlation (Pearson $r$) worked between:

- b. Total Adjustment scores and sociometric scores for boys and for girls for each grade.
- a. Total Adjustment scores and sociometric scores for each grade.
- c. Self Adjustment scores and sociometric scores for each grade.
- d. Social Adjustment scores and sociometric scores for each grade.

Determination of differences in adjustment scores of extreme sociometric groups: The separation of the extreme groups on the sociometric test followed Bronfenbrenner's (5) technique. He points out that in sociometric testing as in any other field, "the question is raised: to what extent are the results of sociometric testing statistically significant; or, to state the problem in somewhat more mundane terms, to what extent is the distribution of choices obtained in a sociometric test at all different from that which would be secured by having blindfolded subjects draw names from a hat". He then proceeds to illustrate, by means of the binomial, a technique for determining the probability that any given number of choices would have been allotted to a person purely as a result of chance factors. This method has the advantage over others
of taking into account the number of persons in the group, the number of criteria (questions) involved, and the number of choices available. He discusses the various techniques available for approximating the expanded binomial, in order to avoid the tedious work involved in expanding the binomial when the group is large, and decides in favour of Carver's approximation by means of the Pearson Type III Function. According to this method, the mean, standard deviation and skewness of the binomial are calculated, and each obtained frequency expressed as a deviation from the mean. Standard units of sociometric status can then be obtained by dividing the deviations by the standard deviation of the binomial. These standard units are taken as abscissal values under the Type III curve of the appropriate skewness, and the area under the curve obtained by means of tables. For the latter step, Bronfenbrenner suggests the use of Salvosa's (23) "Tables of Pearson's Type III Function," as the probability of chance occurrence of any deviation from the binomial mean may then, be read directly. Bronfenbrenner sets the .02 level of probability as being the arbitrary limit of significance. Thus, the extreme groups on the sociometric test were those receiving a greater number of choices than would be expected to occur by chance two times in one hundred, and those receiving fewer choices than would be expected to occur by chance two times in one hundred.
Through further study, working with actual groups, Bronfenbrenner revealed that, "Provided the number of criteria and choices allotted are held constant from group to group, levels of significance are little influenced by variation in size and any given score below the upper limit of significance represents about the same deviation from chance expectancy. Consequently within the indicated limits, with groups varying from ten to fifty ... the raw status score affords a fairly reliable index of sociometric status".

Bronfenbrenner provides a table in his report giving the expected raw score values, and upper and lower limits (critical scores) which may be utilized for various numbers of criteria and allotted choices. From this table (5, p.68), the limits for the extreme groups were obtained.

Because choices were allowed to go outside of the classroom, in question 4 of the sociometric test, the scores obtained from this question were omitted from the raw score total of each individual, in this section of the work. The reasons for doing so were as follows:

1. As Bronfenbrenner's technique is based upon chance expectancy, it would be extremely difficult to ascertain the probability that an individual would be chosen from within the group rather than from outside, and then incorporate the result into the total score.
2. Since the proportion of choices going outside the group varied from one grade level to another, the comparison of these grades would not be accurate with the inclusion of this question.

As sex cleavage was almost complete, the boys and girls of each class were considered as groups in themselves. After the extremes were separated for each of these groups, they were then grouped as two extreme groups for each grade, and the means, differences etc., computed.

The extreme scores did not number more than twenty-six in any one section, so step-intervals of one were employed. The formula used to compute the standard deviation of each of the extreme distributions was \( \sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} \) that is, calculation from original scores by the Short Method, (12, p.63).

**Comparison of the adjustment scores of mutual friends and non-friends:** For the purposes of this study, mutual friends were defined as those, persons receiving choices from individuals whom they have chosen, for each particular criterion. No differentiation was made between first, second or third choices. That is, an individual choosing as his first choice someone who chose him as a third choice, would still be scored as a mutual-friend.
However, if he chose someone on the first question and was chosen by that person on the third, they would not be considered mutual friends. At each grade level, the individuals who had no mutual friends in the group, in any question, were taken as one group, while those having such friendships composed the other. Their mean total adjustment scores were then computed and the differences, and significances of the differences obtained.

The standard error of the difference between the two means in comparing extreme groups in sociometric status, and mutual friends with non-friends, on the basis of adjustment scores, was computed by employing the formula \( \sigma_\delta = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}} \). The significance of the difference, expressed by the critical ratio (CR) was evaluated by reference to Fisher's table of \( t \), at the .05 and .01 levels of confidence, with degrees of freedom \((N_1-1) + (N_2-1)\). This method was employed in view of the small samples available at the extremes.

**Graphic presentation of scores:** In order to facilitate interpretation of the sociometric scores, particularly with respect to any obtained constancy or progression from one grade level to another, frequency distributions of percentage sociometry scores were plotted for each grade. By means of these distributions it was possible to study not only the shape of the curve, but the degree of socialization at each level, and any changes which occurred.
A second group of graphs were plotted of the sociometric scores of the well adjusted individuals, the poorly adjusted and the moderately well adjusted at each grade level. Through examination of these distributions a broader interpretation of results was possible, for, instead of studying the adjustment of individuals of a given sociometric status as was done in the former statistical analysis, the statuses of individuals of varying degrees of adjustment was observed.

The definition of "well adjusted," "moderately well adjusted" and "poorly adjusted" was a relative one, each denoting one third of the grade's adjustment scores.

**Target depictions:** As an illustrative technique, target charts were drawn of the status and some of the choices of the individuals in each classroom. (See Appendix IV). The target method was first devised by Northway (26), whereby the quartile points of a group of sociometric scores were determined, and these served as the dividing rings of a target with the persons in the highest quarter in the centre and the lowest quarter in the outside area. Bronfenbrenner (6) has modified this so that persons with scores higher than .02 probability are in the centre and those with lower than .02 probability are in the outside. This latter method has been employed in this study to correspond to the extreme groups determined by Bronfenbrenner's table. The individuals were numbered, for use on the diagrams, from the person receiving the greatest number of choices (#1) to the one receiving the smallest.
V RESULTS

Correlations: The correlations obtained between scores on the California Test of Personality and sociometric scores in the three grades are found in Table II.

TABLE II

Obtained Correlations between Sociometric Scores and Scores on the California Test of Personality.

<table>
<thead>
<tr>
<th>Scores Compared</th>
<th>Grade III</th>
<th>Grade VII</th>
<th>Grade XI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Adjustment &amp; Socio-metry Percentage scores</td>
<td>.044</td>
<td>.073</td>
<td>.003</td>
</tr>
<tr>
<td>Boys' Girls</td>
<td>.209</td>
<td>-.203</td>
<td>.062</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td>.042</td>
</tr>
<tr>
<td></td>
<td>.002</td>
<td></td>
<td>-.027</td>
</tr>
<tr>
<td>Self Adjustment &amp; Socio-metry Percentage scores</td>
<td>-.005</td>
<td>1.058</td>
<td>.007</td>
</tr>
<tr>
<td>Social Adjustment &amp; Socio-metry Percentage scores</td>
<td>.066</td>
<td>.073</td>
<td>.018</td>
</tr>
</tbody>
</table>

Reference to Table 49 "Correlation coefficients at the 5% and 1% levels of significance," in Garrett (12), indicates that none of these correlation coefficients is significant at the 5% level of confidence.
When the Total Adjustment scores were correlated with the sociometry percentage scores for the boys and girls separately in Grade III, the only r's above ±.100 were obtained. These were +.209 for the boys, and -.203 for the girls, neither of which were significant. The extremely low correlations obtained in every instance are significant as such, however, for they confirm each other, both within the same grade, and from one grade level to another. A consistency which may be observed in Table II is the greater correlation obtained, in each grade, of the Social Adjustment scores, over the Self Adjustment scores, when correlated with percentage sociometric scores. Although the increment is small, a trend seems indicated with respect to direction. A similar tendency was discovered by Bonney (4) who obtained r of +.31 when she correlated Self Adjustment scores with sociometric scores, and r of +.43 when Social Adjustment scores were so related, in a Grade IV class.

Comparison of adjustment scores of extreme sociometric groups: The results of a comparison of the Total Adjustment scores of the significantly high scorers on the sociometric test with the significantly low scorers, indicate that although, in every case, the mean California score of those with high sociometric status was above that of those with low sociometric scores, the differences were small and the critical ratios so small that there was virtually no reason for rejecting the hypothesis that the high and low sociometric scores,
were drawn from the same population with regard to adjustment. Tabulation of these latter results is found in Table III.

**TABLE III**

Means, standard deviations, differences, standard errors of the differences between the means and critical ratios on the California Test of Personality of high and low scorers on the sociometric test.

<table>
<thead>
<tr>
<th></th>
<th>GRADE III</th>
<th>GRADE VII</th>
<th>GRADE XI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High scorers</td>
<td>Low scorers</td>
<td>High scorers</td>
</tr>
<tr>
<td>M.</td>
<td>71.4</td>
<td>70.15</td>
<td>147</td>
</tr>
<tr>
<td>S.D.</td>
<td>9.9</td>
<td>11.7</td>
<td>12.3</td>
</tr>
<tr>
<td>D.</td>
<td>1.25</td>
<td></td>
<td>2.8</td>
</tr>
<tr>
<td>S.E.</td>
<td>3.67</td>
<td></td>
<td>6.37</td>
</tr>
<tr>
<td>C.R.</td>
<td>.27</td>
<td></td>
<td>.44</td>
</tr>
</tbody>
</table>

This second finding confirms the first, and therefore, it seems less likely that the lack of apparent relationship could be caused by factors other than those under investigation.

Comparison of adjustment scores of mutual friends with non-friends: When the mean Total Adjustment scores of the mutual friends were compared, those of non-friends were found to be lower,
but not significantly so. We have no grounds, therefore for rejecting the hypothesis that mutual friends and non-friends are simply random samples drawn from the same population with regard to adjustment. Table IV indicates the results obtained.

**TABLE IV**

Means, standard deviations, differences between the means, standard errors of the differences between the means and critical ratios on the California Test of Personality of mutual friends and non-friends on the sociometric test.

<table>
<thead>
<tr>
<th>GRADE III</th>
<th>GRADE VII</th>
<th>GRADE XI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends</td>
<td>Non-friends</td>
<td>Friends</td>
</tr>
<tr>
<td>M</td>
<td>70.96</td>
<td>68.15</td>
</tr>
<tr>
<td>S.D.</td>
<td>10.65</td>
<td>10.8</td>
</tr>
<tr>
<td>D.</td>
<td>2.81</td>
<td>.92</td>
</tr>
<tr>
<td>S.E.</td>
<td>3.3</td>
<td>7.1</td>
</tr>
<tr>
<td>C.R.</td>
<td>.85</td>
<td>.13</td>
</tr>
</tbody>
</table>

Constancy of the results from one grade level to another:

The outstanding conclusion reached after studying the results along the horizontal lines of Table II, is the marked lack of any progression from one grade to another. Although the correlations of Total Adjustment scores with percentage sociometry scores at each level were positive, the greatest degree of relationship is
found in the middle group: (Grade VII). A breakdown of boys and girls at each grade level reveals the greatest correlation coefficient for boys in Grade III, and the least in Grade VII, i.e. the other extreme to the boys and girls together. In no grade, are all the coefficients positive, or negative, but in all of the grades the correlation coefficients of sociometric scores with Total Adjustment and Social Adjustment are positive.

Examination of Table III reveals that the greatest difference in mean adjustment scores of the extreme sociometric groups occurs at Grade VII and that this difference is the most significant, although, even in this case, the CR is not large enough to allow us to believe that the groups represent different populations.

Table IV indicates that the greatest difference occurring between adjustment scores of mutual friends and non-friends is in Grade XI, and that this is also the most significant difference found. This is contrary to the results of Table III with respect to extreme sociometric groups, as in the case of mutual friends and non-friends, the least significant difference between adjustment scores is in Grade VII. However, because the differences are not significant in any instance we cannot draw conclusions from the differences in the results obtained from grade to grade, and can state merely that no trend can be seen from one grade level to another.

Results read from the graphs: Examination of the distribution of percentage sociometry scores for the three
DISTRIBUTION OF THE COMBINED PERCENTAGE SOCIOMETRY SCORES OF THE TWO GRADE III CLASSES.
DISTRIBUTION OF THE COMBINED PERCENTAGE SOCIOLOGY
SCORES OF THE TWO GRADE VII CLASSES
DISTRIBUTION OF PERCENTAGE SOCIOMETRY SCORES OF THE GRADE XI GROUP
grades indicates that, in each instance, a greater number of persons receive few choices than many. However a trend can be seen from Grade III, through Grade VII to Grade XI. In Grade III a much greater frequency pertained at the mode (at the low end of the scale) than in Grades VII and XI, i.e. the higher the grade, the lower the frequency of the mode interval. At the lowest grade, the decline in frequency from the mode interval was rapid, forming a relatively well marked J curve. For the Grade VII group, the slope was more gradual, and in Grade XI, even more so.

The graphs illustrating the percentage sociometric scores for the three groups, divided according to degree of adjustment in each grade, exhibit illuminating results. In all three grades, a large proportion of the poorly adjusted individuals are at the low end of the sociometric scale, and in no instance, does anyone from this group receive the highest sociometric score. In the two upper grades however, some of those scoring low in adjustment are apparently fairly successful in their social contacts.

The moderately-well adjusted groups, especially in Grade III and VII include a greater proportion of individuals with relatively high sociometric scores. In the two higher grades they include those persons with the highest sociometric scores.

Finally, the well adjusted group, while including many individuals who received high sociometric scores, also included many who received low scores, although, never as many as in the poorly adjusted group.
Legend:
- Well Adjusted
--- Moderately Well Adjusted
- Poorly Adjusted

Distribution of Percentage Sociometry Scores of Groups representing three levels of adjustment in grade VII.
DISTRIBUTION OF PERCENTAGE SOCIOMETRY SCORES OF GROUPS REPRESENTING THREE LEVELS OF ADJUSTMENT IN GRADE XII.
Generalizing, it might be said, that the well adjusted individuals are not necessarily those most, often chosen by their classmates, but that the poorly adjusted are seldom chosen to any great extent.
VI INTERPRETATION AND DISCUSSION

The consistent finding of no statistically significant relationship between sociometric status and adjustment, for all grades, both in terms of correlation, and extreme groups, affirms the hypothesis that no relationship exists.

This consistency is also seen in the lack of a significant difference between adjustment scores of mutual friends and non-friends. The third hypothesis is similarly affirmed, as a result of this consistency. Although the sample was limited to three schools and three grades, in one community, the complete lack of exception to the trend of results greatly increases the probability of finding such a relationship in other groups.

Generalizing from this study, it may then be considered justifiable to agree with Northway in cautioning those who work with sociometric techniques, against evaluating status in the group or even mutual friendship in a specific group as all-important requirements. Success in direct social contact is a valuable asset, and is generally contended to be part of the many facets making up total individual adjustment. Nevertheless, the personal attributes which enter into the degree of success attained in attracting members of the group, seem hardly a sound basis for evaluating individual worth. The results of this study confirm the fallacy in the above argument from the point of view of mental hygiene.

A cautionary note is perhaps advisable, however, with respect to, too wide an interpretation of the results obtained.
It is recognized that there are decided limitations to the measure of adjustment used in the study, namely the California Test of Personality. Although it was chosen primarily because of the wide age range it included, in the various series, in contradiction to any other group test available for the research, certain drawbacks were at the same time recognized. As is the case with any self rating scale, the validity of the test is related to the degree of insight which the individual has into his own activities, although many of the questions have been "camouflaged" in an attempt to obtain a greater degree of honesty.

In addition to the question of insight, levels of interpretation are possible. For example, the subject could reply the way he thought he really acted, the way he thought he should act, or the way he thought his parents or teacher thought he should act. It is recognized that, often, persons clinically diagnosed as "psychopathic," will rate themselves as extremely well adjusted on a self-rating scale. Measures such as the Minnesota Multiphasic Personality Inventory have attempted to remedy this situation. However, the MMPI is not suitable for children, and so could not be employed in this study.

The similarity of the distribution of personality scores in the three grades to the norms, points to the validity of the test results in this setting. This is further emphasized by the consistency of the results obtained.

The similarity between the findings in this study using the California Test of Personality and the clinical studies in Toronto is a further factor pointing to the usefulness of the instrument used.
as a measure of adjustment.

The frequency distribution of sociometric scores drawn up at each grade level supplied additional information regarding the shape of the curves at the elementary and secondary school levels. Northway (28) reports that Leonard and Martin discovered that scores corresponded to a J curve in the nursery school setting. That is, that many children received a few choices, but the very few children received a great many choices.

Examination of the graphs in this study indicates that while the latter part of the distribution in each case roughly follows a J, that the higher the grade level, the less steep the slope. This was noted to a lesser degree, in the number of cases included at the extreme sociometric groups at each level.

In grade III, twenty-six cases fell below the .02 level while only eight were in the high group. The proportions in grade VII were twelve high to ten low. In grade XI, the ratio was eight high to fourteen low. However, the reverse trend in this case could be attributed to the fact that the grade XI members did not know the other members of the group so well.

With respect to mutual friendships, the same trend is noticed. At the Grade III level there were the greatest number of non-friends and in Grade XI the least. This would appear to show a definite increase in socialization with age. That is, the finding of fewer people with extremely low scores in the higher grades seems to indicate a lack of social sensitivity among the younger children, which gradually develops with age. Thus the children who, in nursery school, choose the same companion for many activities, in primary and secondary school have learned to
differentiate those with whom they would prefer to do specific tasks.

The plotting of the sociometric scores of the three groups of persons with similar adjustment scores in each grade, facilitated the broadening of the interpretation derived from the former analysis. The correlation of adjustment and sociometric scores, permitted only a hazy idea of the relationship which actually existed, and the reader was forced to be content in obtaining an overall picture. Similarly, it was conceivable, in comparing mean adjustment scores of the extreme groups on the sociometric test, that a bimodal curve, might be present in the case of one group and a unimodal curve for the other. In this case, a similar mean might still be obtained for the two groups.

However, by means of the graphs, such vagueness was overcome, for actual relationships were then able to be deduced. As a consequence, as stated under the heading of "Results" the generalization was made that the poorly adjusted individuals usually received few choices from their classmates but that the well adjusted individuals did not necessarily receive many choices.

The target charts or sociograms (See Appendix IV) illustrating the structure of each group tested, offer a diagrammatic indication of the attractions, repulsions, "stars" and "isolates" within the group. An interesting comparison can be made, for instance, between the two grade VII classes. In Primary School I, there are eight isolates, who are chosen by no one as their first choices, and five of whom choose as their first choices individuals who are stars. The individual scoring highest in the
group receives five first choices, none of whom he reciprocates. Such a picture illustrates a relative lack of group integration.

On the other hand, in Primary School II, there are fewer isolates, all of whom are more realistic, that is they choose as companions those people more closely related to them with respect to sociometric status. One member of the outer ring receives two choices. The highest scorer in this group, while not reciprocating any of those who chose him, is linked to thirteen people in the group through the five choices he receives and the person he chooses. This group appears then to have a higher degree of integration, than the corresponding class in Primary School I.

By means of such charts, the worker in the field is able to grasp more readily and quickly the specific aspect in which he is interested, but since it was not the purpose of this study to examine the facets of group structure, illustrative charts were considered sufficient diagrammatic evidence, of the use which can be made of such charts.
VII CONCLUSIONS

In view of the findings in this study, the hypothesis that no significant relationship exists between sociometric status and adjustment as measured by the California Test of Personality was affirmed. Similarly, the second hypothesis that no significant difference exists between adjustment scores of mutual friends and non-friends is affirmed, as is the third hypothesis that the lack of relationship between sociometric measures and adjustment, persists at varying age levels.

As a result, the common tendency to evaluate individuals in the light of their sociometric scores, appears to be without foundation with respect to the adequacy of the individual's adjustment. Consequently, caution must be taken, particularly on the part of workers in mental hygiene, to avoid using sociometric measures as tests of adjustment, and to limit the interpretation of sociometric results to an indication of degree of socialization, or to other factors which have been proved to be related to scores in a particular setting.

Bonney, M.E. A sociometric study of the relationship of some factors to mutual friendships on the elementary, secondary and college levels. Sociometry, 1946, 9, 21-47.


(15) Infield, H.F. Research note on the negative value of sociometric tests in co-operative group formation. Sociometry, 1944, 7, p.433.


(26) Northway, M.L. A method for depicting social relations obtained by sociometric testing. Sociometry, 1940, 3.


(34) Schauer, G. Social adjustment in a mental hospital community. Sociometry, 1946, 9, p. 144.


(36) Vreeland, F.M. Social relations in the college fraternity. Sociometry, 142, 5, 151-162.
APPENDIX I

Sociometric Test. National Committee for Mental Hygiene (Canada), Form A.

1. Suppose you were to move to another classroom. Which boys or girls from this classroom would you like best to go with you?
   1. 
   2. 
   3. 

2. Which boys or girls of the classroom would you like to play with during recess?
   1. 
   2. 
   3. 

3. What do you like doing best in school?
   1. 
   2. 
   3. 

4. What do you like doing best out of school?
   1. 
   2. 
   3. 

Name: ____________________________
Address: ____________________________
Age: ____________________________ School: ____________________________
Classroom: ____________________________ Date: ____________________________
APPENDIX II

NATIONAL COMMITTEE FOR MENTAL HYGIENE (CANADA)

Instructions for using the Sociometric Test

M.L. Northway
R. Potashin

This test is designed to ascertain the social relationships within a group and to measure the social acceptance of a member of a group relative to the social acceptance of other members of the same group.

This form (A) of the test is made up of the questions which have been found adequate for school children and is especially constructed for use in grades 4 to 9. It consists of four questions which ask the child to state with whom he prefers to associate under certain circumstances.

DIRECTIONS FOR GIVING TEST

Each child is given a copy of the test which is placed face down on his desk.

The instructor says "To-day we want you to answer some questions. These questions are not an examination or a test and there are no right or wrong answers. They ask you to write which boys and girls you like to work and play with best. This will help the school to make up groups of boys and girls to do things together."

"Now turn over the papers. You will see that there are four questions. The first one asks 'Suppose you were to move to another classroom. Which boys or girls from this classroom would you like best to go with you?' Be sure to put down your first three choices. First the person whom you would like best to go with you, then your second choice and then your third."

"The second question asks 'Which boys or girls of the classroom would you like to play with during recess?' Think of the boys and girls you would like and write your first, second and third choice."

"On question three you are asked 'What you like doing best in school?' When you have decided, write down what it is, and then write the name of the boys and girls in this classroom you would like to do it with you."
"Question four asks 'What you like to do best out of school?' Write what you like best, and then think of the boys and girls you like to have do this with you. In answering this question you may put the names of boys or girls in other rooms in this school, or in other schools, if they are the ones you would really choose."

"Some of the boys and girls who belong to this classroom are away to-day. However you know their names and if they are the people you would choose you may put their names down."

"You may put the same name to more than one question if you would really choose the same person each time."

"Be sure to write the last names as well as the first name of the boys and girls you choose." (In order to facilitate this it is advisable to write the names of the children in the class alphabetically on the blackboard.)

"Any questions?"

"Now begin filling in your answers."

Give the children a reasonable amount of time to answer. Do not spell children's names out to the class, but tell the children to spell the names the way they think they sound. When they are finished be sure the children fill in the information required at the bottom of the sheet: Name, address, age, school, classroom, date.
Appendix III

A sample tabulating chart similar to those used in this study.

This illustrates the choices of a group of 3 boys and 5 girls with four criteria and three choices allotted.

<table>
<thead>
<tr>
<th>Choices Made By</th>
<th>Greene</th>
<th>Harris</th>
<th>McLean</th>
<th>Andrews J.</th>
<th>Bowers B.</th>
<th>Lee P.</th>
<th>Malcolm J.</th>
<th>Weber P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greene</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harris</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McLean</td>
<td></td>
<td></td>
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<td></td>
</tr>
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<td>Andrews J.</td>
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<td></td>
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</tr>
<tr>
<td>Bowers B.</td>
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<td></td>
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</tr>
<tr>
<td>Lee P.</td>
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<td></td>
</tr>
<tr>
<td>Malcolm J.</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Weber P.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Choices Received By:

<table>
<thead>
<tr>
<th>Greene</th>
<th>Harris</th>
<th>McLean</th>
<th>Andrews J.</th>
<th>Bowers B.</th>
<th>Lee P.</th>
<th>Malcolm J.</th>
<th>Weber P.</th>
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APPENDIX IV

Sociometric target diagrams of a section of results obtained in the individual class groups.

Legend:

△ Boy
○ Girl
←→ Mutual Choice

First choices on the first criterion of members of Grade III of Primary School I.

Status of the members is derived from the raw score values of choices received on three criteria.
Legend:

△ Boy
○ Girl

Mutual Choice

First choices on the first criterion of members of Grade III of Primary School II.

Status of the members is derived from the raw score values of choices received on three criteria.
Legend:

△ Boy
○ Girl

Mutual Choice

*First choices on the first criterion of members of Grade VII of Primary School I.*

Status of the members is derived from the raw score values of choices received on three criteria.
Legend:

Δ  Boy
O  Girl

→ Mutual Choice

First choices on the first criterion of members of Grade VII of Primary School II.

Status of the members is derived from the raw score values of choices received on three criteria.
Legend:

△ Boy
○ Girl

Mutual Choice

First choices on the first criterion of members of a group of grade XI English students in one secondary school.

Status of the members is derived from the raw score values of choices received on three criteria.