CHAPTER X

A STATISTICAL CORRELATION OF PERSONALITY MEASUREMENTS

The tables which follow are a statistical representation of the relationships existing between the various factors studied in this thesis.

Since percentages are likely to give a distorted view when numbers are small, it was thought that the material already processed through percentages, needed further statistical elaboration.

First it was calculated whether the various factors studied and measured were dependent or independent, whether, for instance, personality and intelligence in the sample under investigation were correlated factors or independent of each other. The Chi-square statistic was employed to this effect. The formula used is:

\[ \chi^2 = \sum \left[ \frac{(fo - fe)^2}{fe} \right] ; \quad fe = \frac{\text{row total} \times \text{column total}}{N} \]

where \( fo \) = obtained frequency
\( fe \) = expected frequency
\( N \) = total number

In 2\( \times \)2 contingency tables the chi square was computed by the formula

\[ \chi^2 = \frac{N( ad - bc )^2}{(a+b)(a+c)(b+d)(c+d)} \]
where \(a, b, c, d\) are the obtained frequencies.\(^{146}\)

The resulting chi square permits us to know whether the factors compared are dependent factors or not. If they prove to be independent our investigation is brought to an end there. We conclude that there is no significant correlation between the compared factors. If the two factors compared prove to be correlated we proceed to compare the groups into which one of the factors has been divided with the groups of the other factor.

A chi square which falls below the 5 per cent level of confidence is not considered statistically significant, i.e., is not sufficient to reject the null hypothesis, which assumes that the distribution of cases obtained comes from a random distribution.

Now observing Table XV we find that the Rorschach personality has a significant correlation with adjustment as revealed by the same test,\(^{147}\) and with the Raven intelligence test, but has no significant correlation with adjustment as expressed in the Sentence Completion test, and with the sociometric status.

\(^{146}\) J. P. Guilford, \textit{op. cit.}, pp. 273-280.

\(^{147}\) It should be noted that the criteria followed to assess the personality of a subject and his adjustment were different and independent.
As regards the degree of association between personality and sociometric status, the chi square shows no significant correlation. The chi square \( (X^2 = 9.68) \) with six degrees of freedom, falls between 20 and 10 percent levels which is not sufficient to reject the null hypothesis. We conclude, therefore, that personality and sociometric status are not proved to be correlated in our sample. The differences in sociometric status between the rich, medium and poor personality groups are not considered statistically significant, that is, they could have come from sampling distribution alone.

The same reasoning applies to the personality and adjustment factors, the latter as revealed by the Sentence Completion test. The chi square \( (X^2 = 1.72) \) falls below the 5 per cent level.

When Rorschach personality and Rorschach adjustment are compared, the chi square \( (X^2 = 16.56) \) shows a correlation between the two factors which is significant beyond the 1 per cent level. Once we know that the two factors, are dependent, we take the second step: our main intent is to compare the two extreme groups, viz., rich and poor personalities and verify whether the difference in adjustment between the two groups is significant or can be accounted for by sampling along. The chi square \( (X^2 = 0.28) \)
evinces no significant difference in adjustment between the rich and poor personalities.

Now comparing the rich and the medium personalities, the chi square \( (X^2 = 9.41) \) is significant beyond the 1 per cent level, that is, sampling alone could account for the results less than once in a hundred times. The difference between the medium and poor personalities is also very significant.

The conclusion is that the medium personality group is better adjusted than the rich and the poor personality groups.

Personality and intelligence are dependent factors. We further inquire whether the rich personality group will obtain a higher percentage of clever students than the poor personality group or vice versa. The sample was divided on the basis of intelligence into four quartiles; this division provided a more detailed description of the intelligence of the sample. But since the groups were too small in the two lower quartiles for reliable statistical evaluation, the four quartiles had to be telescoped into two groups dividing by the median.

The chi square \( (X^2 = 8.08) \) proves that the difference in intelligence between the rich and the poor personality groups is very significant (beyond the 1 per cent level).
The actual difference expressed percentagewise shows the following figures: In the rich personality group 86% are above the median, while in the poor personality group only 57.5% are above the median.

Finally the chi square \( (x^2_6 = 9.68) \) formulating the correlation between personality and sociometric status is not significant. The factors are, therefore, independent, a fact which prevents us from exploring any further association between personality groups and high or low sociometric status.

A summary of the results. A summary of the results of our investigation will be the following:

1. - The rich and poor personality groups do not differ significantly in adjustment as revealed in the Rorschach test; both groups are notably disturbed.

2. - The difference in adjustment between the extreme personality groups and the medium personality group is very significant. The medium personality group is better adjusted than the rich and poor personality groups.

3. - There is no significant correlation between Rorschach personality on one side and adjustment, as reflected in the Sentence Completion test, on the other.

\[148\] Since the median divides the sample into two halves, those students who are exactly at the 50th percentile do not belong theoretically to either of the two groups. For reasons of convenience we include those subjects in the upper half.
4. There is a significant difference between the rich and poor personality groups as regards intelligence: the rich personality group is brighter intellectually than the poor personality group.

5. There is no significant correlation between personality and sociometric status. This last conclusion is an answer to the problem stated at the beginning of this study. Personality and sociometric status in our sample are two independent factors. Looking only at the percentage of high and low sociometric status in the two extreme personality groups we might feel tempted to believe that the subjects who fall in the rich-personality group have a higher sociometric status than the subjects belonging to the poor-personality group. Yet the apparent difference is not statistically significant.

We terminate this discussion by stating that the subjects with a rich personality appear to be sociometrically higher, as a group, than the subjects with a poor personality, but we have no sufficient evidence to reject the hypothesis that this difference comes from sampling alone.

Table XVI formulates the correlation mediating between Sociometric status on one side and personality, adjustment and intelligence on the other. We observe that sociometric status does not correlate significantly with any of the
other factors. We conclude, therefore, that the sociometric status of the subjects, as a group, is independent of their personality, adjustment and intelligence.

Examining the percentage alone there is an easily observable difference in personality between the group of highs sociometric status and the group of low status: 30% of the SAC group have a rich personality and only 12% have a poor personality. In the SBC group 22% have a rich personality and 41.5% have a poor personality. From the difference between the two groups it appears that rich personality is more associated with high sociometric status than the poor personality. We cannot conclude, however, with sufficient confidence that this difference is significant.

We could argue in a similar manner as regards sociometric status and adjustment. In both, the Rorschach test and the Sentence Completion test, the percentage suggests that the SBC group is more disturbed than the SAC group; but here again the chi square gives no evidence of any significant degree of association between the two factors.

Regarding the correlation between the sociometric status and intelligence, even the difference in percentage appears insignificant.
A further development of the correlation of the sociometric test with the projective techniques and the intelligence test. We have just pointed out that the correlations between the sociometric results and the results of the three other forms of assessing personality (Rorschach, Sentence Completion Test and Raven), were not statistically significant. The subjects of the research study were grouped in four sociometric levels, namely, significantly above chance, above chance, below chance, and significantly below chance.

This absence of a significant correlation prompted the present worker to make a further attempt to establish relationships between the sociometric results and the results of the aforesaid three forms of appraising personality. The new step consisted in telescoping the four sociometric groups mentioned above into two, viz. above chance and below chance. This new step does not go beyond the scope of the thesis as defined at the beginning, though the reduction of four groups to two was not then envisaged. From the sociometric and statistical points of view, it offers interesting perspectives. If the new relationships prove to be statistically significant, then our hypothesis is that the negative results obtained earlier, i.e., the absence of
a statistically significant relationship, was due to too
great an atomization of the sample into sociometric groups.

If, on the other hand, the new relationships are not
statistically significant, this will be a further proof that
in the sample under investigation the sociometric factor
is independent of, or is not significantly related to, the
other three factors of personality assessment. This negative
result will be more in line with the connected investigations
on sociometric methods and projective techniques just
reviewed.

The statistic employed is again the chi-square.
The results are presented in Table XVIII, p. 325.

From the results of the table we conclude that
the correlation of the sociometric status of the 161 subjects
of the sample, with their personality, adjustment and
intelligence, is not statistically significant.

The relationship closest to significance is the one
mediating between sociometric status and Rorschach personality.
The chi-square is just below the .05 level of confidence.
The above-chance sociometric group has a higher percentage
of rich and medium personalities, and a notably lower
percentage of poor personalities than the below-chance
sociometric group. This relationship is of interest because
it nearly reaches the level of significance.
<table>
<thead>
<tr>
<th>Sociometric Status</th>
<th>Cases</th>
<th>Percent</th>
<th>Total</th>
<th>Raven Intelligence</th>
<th>Per Cent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P.50 &amp; above</td>
<td>P. below 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No.</td>
<td>Per Cent</td>
<td>No.</td>
</tr>
<tr>
<td>Above Chance</td>
<td>70</td>
<td>43.5</td>
<td>0.0</td>
<td>50</td>
<td>71.4</td>
<td>20</td>
</tr>
<tr>
<td>Below Chance</td>
<td>91</td>
<td>56.6</td>
<td>0.0</td>
<td>60</td>
<td>65.9</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>161</td>
<td>100.1</td>
<td></td>
<td>110</td>
<td>51</td>
<td></td>
</tr>
</tbody>
</table>

Factors correlated:

Sociometric Status -- Raven

$\chi^2$ with two degrees of freedom

Not significant.

Sociometric Status -- Raven

$\chi^2 = 0.55$. Not significant.
The correlations mediating between the sociometric status on one side, and adjustment (as revealed by the Rorschach and the Sentence Completion Test) and intelligence (as measured by the Raven Test) on the other, show a better adjustment and a higher intellectual level in favour of the above-chance group, but the correlation is not statistically significant, i.e., it does not exclude the null hypothesis with sufficient confidence.

Summary of the results. The higher sociometric group shows a greater correlation with rich and medium personalities than the lower sociometric group. Conversely the lower sociometric group shows a greater correlation with poor personalities than the higher sociometric group. The correlation between sociometric status and personality approaches the level of significance. On the strength of the above results we may tentatively associate high sociometric status with rich and medium personality, and low sociometric status with poor and medium personality.

The higher sociometric group shows a general tendency to be better adjusted and evinces a higher level of intelligence than the low sociometric group, but the correlation is not statistically significant.