CHAPTER IX
CORRELATIONAL STUDIES OF THE TEST SCORES

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9.1 Inter-correlations between boys and girls in Comprehension and Error Score

9.2 Regression equations in score form

9.3 Age level and Comprehension
Correlational Studies of the Test Scores

The value of the present test would, however, depend greatly on its being put to use. In this type of research it is of vital importance to show that there is a great potentiality of its application. After the different standardization work of the test was over, it was ready to be put to different uses. The investigator was interested to know how the test could be used for further studies. This further administration and studies were undertaken by four teachers who became interested in this oral reading test when the investigator moved out to the different schools during his final testing. All these four were language teachers who showed remarkable enthusiasm to improve their way of teaching of English. The investigator explained the procedure of administering the oral reading test and directed them to include boys and girls from rural and urban areas just as it was in the final administration. Each teacher administered the test on about more than fifty pupils of his locality. The investigator moved with one of the groups. The total number of pupils tested were 249 out of which 148 boys and 101 girls came from rural and urban areas. The number of rural pupils in the above group was 129 while that from the urban area was 120. Three types of studies were reported
in this chapter out of the data obtained. The studies were:

1. Correlational studies of the sex groups and the area groups.
2. Regression and prediction
3. Relation between Age-level and Comprehension

9.1 Inter-correlations between boys and girls in Comprehension and Error Scores

The various intercorrelations were found out by product moment method. These correlations were both on comprehension scores and error scores and also between the above two. The study was for boys as well as girls. The data of 249 pupils were computerised and the correlations and the interpretations are given below.

| Table 42 |
|-------------------|---|---|---|---|
| **Inter-correlations of Comprehension and Error Scores** |
| N = 249 | (1) | (2) | (3) | (4) |
| 1 Boys' Comprehension | - |   |   |   |
| 2 Girls' Comprehension | .05 | - |   |   |
| 3 Boys' Error | -.21**-.0006 |   |   |   |
| 4 Girls' Error | -.08 | -.59** .08 |   |   |

** significant at .01 level
Interpretations

Looking from the table 42, the following interpretations are drawn:

1. Correlation between the scores of boys' comprehension and girls' comprehension was 0.05, which was not significant at .05 level. So the hypothesis that the two variables were related was rejected and it was concluded that there was significant difference between the comprehension scores of boys and girls.

2. A similar phenomenon could be observed even in the case of error scores. Correlation between the scores of boys error score and girls error score was .08 which was not significant at .05 level.

3. Correlation between the error scores and comprehension scores of the same sex—of boys -.21 and that of girls -.59—which were significant at .01 level. Hence the hypothesis that the two variables were related was accepted but deviates in the negative direction; i.e. if the comprehension is more the error made is less.

Intercorrelations of boys and girls in different areas were studied both in comprehension scores and error scores. The data regarding the 249 pupils were computerized and the correlations and the interpretations are given below.
Table 43

Intercorrelation between the various study groups on comprehension score and error score

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=249</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Rural boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Rural girls</td>
<td>.21**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Urban boys</td>
<td>-.12</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Urban girls</td>
<td>-.08</td>
<td>-.21**</td>
<td>.003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Rural boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.29**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Rural girls</td>
<td></td>
<td></td>
<td></td>
<td>.29**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Urban boys</td>
<td></td>
<td></td>
<td>.03</td>
<td>-.22**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Urban girls</td>
<td></td>
<td></td>
<td>-.05</td>
<td>-.27**</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** significant at .01 level

Interpretation

Looking from the table 43 the following variables are—

—Significantly correlated at .01 level.

a. Rural girls' and rural boys' comprehension.

b. Urban girls' and rural girls' comprehension.
c. Rural girls' and rural boys' Error score.
d. Urban boys' and rural girls' Error score.
e. Urban girls' and rural girls' Error score.

All other correlations between the different groups were not significant.

The correlations which we have studied in the early part of the chapter would lead us further to the prediction of comprehension score from the error scores and/or vice versa. For this purpose regression equations were established from the data.

9.2 Regression equations in score form

Using regression lines in deviation form does not give the actual scores but it gives the deviations from the means of 'X' and 'Y' distributions. The score form of the regression equation can be obtained so as to get the score directly by putting the value of the dependent variable and then calculating the independent variable 'Y'. Here we get actual scores. But the score applies to the same type of pupils from where the sample is drawn. Those who are studying in standard VIII of Gujarat are only said to be the population whose dependent variable can be predicted. By knowing the individual comprehension score, one would like to predict the number of errors he would make in the
present test. For this express reason, regression equations have been established for boys and girls separately. They have been computerised with the help of a computer. Various regression lines are computerised and given below.

Table 44
The equations of various Regression Lines
(for graphs 7, 8, 9, 10)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Group</th>
<th>Subject</th>
<th>Regression Line equation</th>
<th>The standard error of estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Boys</td>
<td>Comprehension on Error</td>
<td>-0.0142x + 17.3542</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Boys</td>
<td>Error on Comprehension</td>
<td>-3.1056x + 185.1559</td>
<td>135</td>
</tr>
<tr>
<td>3</td>
<td>Girls</td>
<td>Comprehension on Error</td>
<td>-0.0434x + 22.0863</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Girls</td>
<td>Error on Comprehension</td>
<td>-8.0569x + 253.8472</td>
<td>102</td>
</tr>
</tbody>
</table>

The prediction obtained by the regression line is approximate.

Standard error estimate is calculated along with the regression line to make the prediction more accurate. Standard error estimate gives the quantity by which the actual value may miss the predicted value. It gives the maximum as well as minimum error estimate, i.e. it gives positive and negative values.
To present the regressions graphically, the four regression drawings have been given and interpreted individually to bring out the prominent characteristics of each.

Regression Line showing Boys Comprehension on the Error Score.

Interpretations

1. Slope is in decreasing line showing that more errors are accompanied by less comprehension.

2. Comprehension of any individual pupil (here any boy) can be predicted if we know his error score in oral reading.

3. Majority cases of comprehension are less than the mean score.
Regression line showing boys' comprehension on error.
Interpretations

1. Slope is in decreasing line showing that more comprehension is accompanied by less errors.

2. The error committed by any individual pupil (here any boy) can be predicted if we know his comprehension score.

3. All the pupils making more than 13 comprehension scores obtain less than the mean of error scores.
TABLE

GRAPH 8

| Y Scale | X axis: 3 scores: 1.5 cm.
|---------|-------------------------
| 325     | Y axis: 25 scores: 1.5 cm.
| 300     |
| 275     |
| 250     |
| 225     |
| 200     |
| 175     |
| 150     |
| 125     |
| 100     |
| 75      |
| 50      |
| 25      |

ERROR ON COMPREHENSION

REGRESSION LINE SHOWING BOYS' ERROR ON COMPREHENSION
Regression line showing girls' Comprehension scores on Error.

**Interpretations**

1. The graph is declined to the right side showing that when the error made is less, the comprehension is more.

2. Means of error score, comprehension score and the regression line pass through the same point showing that the means of the scores lie at a definite point in the regression line, i.e. the pupil making the mean error score makes the mean comprehension score.

3. Comprehension of any individual pupil (here any girl) can be predicted if we know her error score.
Regression line showing girls' comprehension on error.
Regression line showing girls' Error score on Comprehension:

Interpretations

1. Slope is in decreasing line showing that more comprehension is accompanied by less errors.

2. The mean of comprehension score, mean of error score and the regression line pass through the same point showing that the mean score of comprehension correlates with that of error score and hence we can predict that those who get mean of comprehension score will get the mean of error score.

3. Error score of any individual pupil (here any girl) can be predicted if we know her comprehension score.
Regression line showing girls' error on comprehension.
**Suggestion**

Using the above regression lines we could predict the comprehension of an individual pupil if we knew the number of error he had made during the oral reading. It is also possible to predict the number of errors if we knew the comprehension score of the pupil concerned. From the experience the investigator gained in the above predictions, it is suggested to predict comprehension score by knowing the error score and he does not favour the second type of prediction as accurate as the first type of prediction.

The data regarding the 249 pupils were studied according to their age. The age of the pupils varied from twelve to seventeen. Mean, and standard deviation of each age group was studied on their comprehension score. Significant differences of the means of the various age groups were tested and the study is presented below.

**9.3 Age level and Comprehension**

Generally it is said that as age increases, the comprehension also increases. To test this, null-hypothesis was formulated.

**Null hypothesis : There is no difference between the comprehension scores of pupils having different ages.** This general form of null-hypothesis was tested and the result is given in the following table.
<table>
<thead>
<tr>
<th>Age</th>
<th>No. of cases</th>
<th>Mean</th>
<th>Mean Diff.</th>
<th>S.D.</th>
<th>D</th>
<th>C.R.</th>
<th>Remarks</th>
<th>Result of null hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>11</td>
<td>14.23</td>
<td>1.03</td>
<td>5.43</td>
<td>0.98</td>
<td>1.05</td>
<td>not significant</td>
<td>H₀ retained</td>
</tr>
<tr>
<td>17</td>
<td>10</td>
<td>15.26</td>
<td>4.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>49</td>
<td>16.40</td>
<td>1.14</td>
<td>6.77</td>
<td>0.77</td>
<td>1.48</td>
<td>not significant</td>
<td>H₀ retained</td>
</tr>
<tr>
<td>17</td>
<td>10</td>
<td>15.26</td>
<td>4.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>99</td>
<td>16.66</td>
<td>1.4</td>
<td>5.40</td>
<td>0.69</td>
<td>2.03</td>
<td>Significant</td>
<td>H₁ rejected</td>
</tr>
<tr>
<td>17</td>
<td>10</td>
<td>15.26</td>
<td>4.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>59</td>
<td>16.07</td>
<td>0.81</td>
<td>5.67</td>
<td>0.72</td>
<td>1.13</td>
<td>not significant</td>
<td>H₀ retained</td>
</tr>
<tr>
<td>17</td>
<td>10</td>
<td>15.26</td>
<td>4.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>21</td>
<td>15.72</td>
<td>0.46</td>
<td>5.44</td>
<td>0.83</td>
<td>0.55</td>
<td>not significant</td>
<td>H₀ retained</td>
</tr>
<tr>
<td>17</td>
<td>10</td>
<td>15.26</td>
<td>4.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Taking the means of the different age groups a graph is drawn where age is on 'X' axis and Mean values on 'Y' axis and presented on the next page 211.
AGE LEVEL AND COMPREHENSION
Looking to the above table 45 and the graph it was concluded that there was no difference in comprehension because of maturation in age except at the ages of fourteen and seventeen. This result is unexpected but if we look psychologically it can be interpreted in this way.

Twelve is the age when the girls and boys are on the threshold of adolescence. They have their own curiosities and anxieties about new stirrings in their body. Because of this engrossment, their mind may be wavering and that is the cause as to why maturity did not play its proper part in this experiment.

The various regression equations are computerized and given below:

Regression Lines
Regression of 20n 1
\[ Y = -3.1056x + 185.1559 \]
Regression of 10N 2
\[ Y = -0.0142x + 17.3542 \]
Regression of 30N 1
\[ Y = 0.0577x + 16.1303 \]
Regression of 10N 3
\[ Y = 0.0513x + 14.5225 \]
Regression of 40N 1
\[ Y = -1.1966x + 15.1449 \]
Regression of 10N
\[ Y = -0.0057x + 16.0665 \]
Regression of 50N
\[ Y = 1.0577x + 16.1303 \]
Regression of 10N
\[ Y = 0.4723x + 0.0865 \]
Regression of 60N
\[ Y = -4.3022x + 320.3009 \]
Regression of 10N
\[ Y = -0.0093x + 17.7635 \]
Regression of 30N
\[ Y = 0.0000x + 17.0265 \]
Regression of 20N
\[ Y = -0.0097x + 137.5038 \]
Regression of 40N
\[ Y = 0.0810x + 105.5890 \]
Regression of 20N
\[ Y = 0.0846x + 127.4565 \]
Regression of 50N
\[ Y = -0.0143x + 34.3807 \]
Regression of 20N
\[ Y = -1.3915x + 182.4492 \]
Regression of 60N
\[ Y = 1.0810x + 105.5890 \]
Regression of 20N
\[ Y = 0.5100x + 7.7539 \]
Regression of 40N 3
\[ Y = -9.0569x + 253.8472 \]
Regression of 30N 4
\[ Y = -0.0434x + 22.0863 \]
Regression of 50N 3
\[ Y = 1.0513x + 14.5225 \]
Regression of 30N 5
\[ Y = 0.5276x - 0.0866 \]
Regression of 60N 3
\[ Y = -8.0667x + 391.3512 \]
Regression of 30N 6
\[ Y = -0.0196x + 22.0072 \]
Regression of 50N 4
\[ Y = -0.0491x + 38.1528 \]
Regression of 40N 5
\[ Y = 4.5781x + 265.1298 \]
Regression of 60N 4
\[ Y = 1.0846x + 127.4566 \]
Regression of 40N 6
\[ Y = 0.4899x - 7.7540 \]
Regression of 60N 5
\[ Y = -5.9697x + 447.5793 \]
Regression of 50N 6
\[ Y = -0.0289x + 39.7707 \]

Where 1 stands for Boys' comprehension
2 stands for Boys' error
3 stands for Girls' comprehension
4 stands for Girls' error
5 stands for Total comprehension
6 stands for Total error