CHAPTER-VII
STEP-UP
REGRESSION
EQUATION
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STEP-UP REGRESSION EQUATION

In order to examine conjoint effect of moral judgement, intelligence and parental behaviour on the mental health of school adolescents, the techniques of multiple-R and Step-up Regression Equation were employed.

Multiple - Regression Analysis is defined as a method of analysing the collective and separate contribution of two or more independent variables to the variation of a dependent variable. Step-up Regression Equations were set up by adding one independent variable to the previous, one at a time with the criterion measure of mental health and examined for their efficacy in predicting mental health.

The square of multiple correlation (R\(^2\)) called the coefficient of determination, shows the proportion of variance of the criterion accounted for by different predictors. Step wise multiple regression analysis enables to know the most relevant variables which account for maximum variance in the criterion, from the total set of variables.

The following hypotheses were tested with the help of regression analysis :

1. (a) Significant variance towards mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour.

(b) Significant variance towards high level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour.

(c) Significant variance towards average level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour.

(d) Significant variance towards low level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour.
Thus, the values of Multiple - R were computed and entered in Tables 7.1.1 to 7.1.4. Variables symbol as entered in all the regression equation have been given in Table of symbols.

**Table of symbols**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Variable Name</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moral judgement</td>
<td>(x_1)</td>
</tr>
<tr>
<td>2</td>
<td>Intelligence</td>
<td>(x_2)</td>
</tr>
<tr>
<td>3</td>
<td>Parental behaviour</td>
<td>(x_3)</td>
</tr>
<tr>
<td>4</td>
<td>Mental health</td>
<td>(Y)</td>
</tr>
</tbody>
</table>

**HYPOTHESIS 1(a)**

**Results**

To test Hypothesis 1(a) which states, “Significant variance towards mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour,” the values of Multiple - R were calculated and entered in Table 7.1.1. The pictorial form of respective table has been shown in Figure 7.1(a).

**Table 7.1.1.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>(R^2)</th>
<th>(R)</th>
<th>% Variance</th>
<th>(F)</th>
<th>Step-Up Regression Equations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health</td>
<td>0.2617</td>
<td>0.5116</td>
<td>26.17</td>
<td>58.62**</td>
<td>(Y = 26.40** + .23** x_1 + .44** x_2 + .36 NS x_3)</td>
</tr>
<tr>
<td>Moral judgement</td>
<td>0.2582</td>
<td>0.5081</td>
<td>25.82</td>
<td>86.49**</td>
<td>(Y = 27.19** + .24** x_1 + .45** x_3)</td>
</tr>
<tr>
<td>Parental behaviour</td>
<td>0.2331</td>
<td>0.4828</td>
<td>23.31</td>
<td>151.37**</td>
<td>(Y = 29.65** + .54** x_1) ** Significant at .01 level</td>
</tr>
</tbody>
</table>

1. Mental health
2. Moral judgement
3. Intelligence
4. Parental behaviour
First of all, the effect of all the three independent variables, i.e., moral judgement, intelligence and parental behaviour was seen on mental health. R\(^2\) was 0.2617 which was significant at .01 level of significance (Vide Table 7.1.1). However, the variable, parental behaviour was not significant at any level of significance but the variables, moral judgement and intelligence were significant at .01 level of significance.

Further, in the second trial, the variable of parental behaviour which was not significant was deleted. The R\(^2\) came to be 0.2582 which was again significant at .01 level. The contribution of moral judgement and intelligence came to be significant at .01 level of significance.

Similarly, in the third trial, variable of moral judgement with the lowest t-value was deleted. In final run equation R\(^2\) came to be 0.2331 which was also significant at .01 level. Again the contribution of intelligence came to be significant at .01 level of significance.
Discussion of the Results

From the above discussion it can be concluded that moral judgement and intelligence contributed a significant variance towards mental health of school adolescents but the variable, parental behaviour is not a good predictor of mental health of school adolescents. The findings also indicate that the total prediction by the independent variables, i.e. moral judgement, intelligence and parental behaviour was 26.17% of variance towards mental health. It means that the remaining 73.83% of variability remains unexplained. The results suggest that there are some other variable than moral judgement, intelligence and parental behaviour which may be highly related to mental health.

Thus, the Hypothesis 1(b), namely, “Significant variance towards mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour” stands partially accepted.

HYPOTHESIS 1(b)

Results

To test Hypothesis 1(b) which states, “Significant variance towards high level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour.” the values of Multiple - R were calculated and entered in Table 7.1.2. The pictorial form of respective table has been shown in Figure 7.1(b).
First of all, the effect of all the three independent variables, i.e., moral judgement, intelligence and parental behaviour was seen on high level of mental health. $R^2$ was .0803 which was significant at .01 level of
significance (Vide Table 7.1.2). However, no variable was significant at any level of significance.

Further, in the second trial, the variable of parental behaviour with the lowest t-value was deleted. The $R^2$ came to be .0727 which was again significant at .01 level of significance. Converting moral judgement to be a significant contributed towards high level of mental health.

In addition, in the third trial, variable of intelligence, which was non-significant was deleted. In the final run equation, $R^2$ was found to be .0538 highly significant at .01 level. The contribution of moral judgement came to be significant .01 level, which was significant at .05 level in the second equation.

**Discussion of the Results**

On the basis of above discussion, it can be concluded that the moral judgement only out of three independent variables came out to be a significant contributed towards high level of mental health of school adolescents. The findings also indicate that the total prediction by the independent variables, i.e., moral judgement, intelligence and parental behaviour was 8.03% of variance towards high level of mental health. It means that the remaining 91.97% of variability remains unexplained. The results suggests that there are some other variable than moral judgement, intelligence and parental behaviour which may be highly related to high level of mental health.

Thus, the Hypothesis 1(b), namely, “Significant variance towards high level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour” stands partially accepted and partially rejected.
HYPOTHESIS 1(c)

Results

To test Hypothesis 1(c) which states, "Significant variance towards average level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour," the values of Multiple - R were calculated and entered in Table 7.1.3. The pictorial form of respective table has been shown in Figure 7.1(c).

Table 7.1.3

R-value and F-ratio for the average level of mental health of school adolescents.

<table>
<thead>
<tr>
<th>Variable</th>
<th>R^2</th>
<th>R</th>
<th>%</th>
<th>F</th>
<th>Step-Up Regression Equations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.234</td>
<td>0.1173</td>
<td>0.3425</td>
<td>11.73</td>
<td>9.96**</td>
<td>Y = 63.58** + .52 NS x_1 + .13** x_2 + .65 NS x_3</td>
</tr>
<tr>
<td>1.23</td>
<td>0.1151</td>
<td>0.3393</td>
<td>11.51</td>
<td>14.70**</td>
<td>Y = 63.71** + .54 NS x_1 + .12** x_2</td>
</tr>
<tr>
<td>1.3</td>
<td>.1046</td>
<td>0.3234</td>
<td>10.46</td>
<td>26.52**</td>
<td>Y = 63.96** + .16** x_1</td>
</tr>
</tbody>
</table>

** Significant at .01 level

1. Mental health
2. Moral judgement
3. Intelligence
4. Parental behaviour
First of all, the effect of all the three independent variables, i.e., moral judgement, intelligence and parental behaviour was seen on average level of mental health. $R^2$ was 0.1173 which was significant at .01 level of significance (Vide Table 7.1.3). However, the variables, moral judgement and parental behaviour were not significant at any level of significance. But the contribution of intelligence came to be significant at .01 level of significance.

Further, in the second trial, the variable of parental behaviour with the lowest t-value was deleted. The $R^2$ came to be .1151 which was also significant at .01 level of significance. However, variable, moral judgement again was not significant at any level of significance but the contribution of variable intelligence came to be significant at .01 level.

Similarly, in the third trial, variable of moral judgement which was not significant was deleted. In final run equation, $R^2$ came to be .1046 highly significant at .01 level. The contribution of intelligence came to be significant at .01 level, which was also significant at .01 level in the second equation.
Discussion of the Results

Hence, from the above discussion it can be concluded that intelligence only out of the three independent variables came out to be a significant contributed towards average level of mental health of school adolescents. The findings also indicate that the total prediction by the independent variables, i.e., moral judgement, intelligence and parental behaviour was 11.73% of variance towards average level of mental health. It means that the remaining 88.27% of variability remains unexplained. The results suggests that there are some other variable than moral judgement, intelligence and parental behaviour which may be highly related to average level of mental health.

Thus, the Hypothesis 1(c), namely, “Significant variance towards average level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour” stands partially accepted and partially rejected.

HYPOTHESIS 1(d)

Results

To test Hypothesis 1(d) which states, “Significant variance towards low level of mental health of school adolescents would be contributed by major correlates such as moral judgement, intelligence and parental behaviour.” the values of Multiple - R were calculated and entered in Table 7.1.4. The pictorial form of respective table has been shown in Figure 7.1(d).
Table 7.1.4.
R-value and F-ratio for the low level of mental help of school adolescents.

<table>
<thead>
<tr>
<th>Variable</th>
<th>( R^2 )</th>
<th>( R )</th>
<th>( % )</th>
<th>( F )</th>
<th>Step-Up Regression Equations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.234</td>
<td>0.0444</td>
<td>0.2107</td>
<td>4.44</td>
<td>2.06(^{\text{NS}})</td>
<td>( Y = 48.42^{**} + 0.11^{\text{NS}} x_1 + 0.60^{\text{NS}} x_2 + 0.67^{\text{NS}} x_3 )</td>
</tr>
<tr>
<td>1.23</td>
<td>0.0420</td>
<td>0.2049</td>
<td>4.20</td>
<td>2.93(*)</td>
<td>( Y = 50.45^{**} + 0.12^{\text{NS}} x_1 + 0.63^{\text{NS}} x_2 )</td>
</tr>
<tr>
<td>1.2</td>
<td>0.0326</td>
<td>0.1806</td>
<td>3.26</td>
<td>4.55^{**}</td>
<td>( Y = 54.34^{**} + 0.15^{*} x_1 )</td>
</tr>
</tbody>
</table>

** Significant at .01 level
* Significant at .05 level

1. Mental health
2. Moral judgement
3. Intelligence
4. Parental behaviour

Figure 7.1(d)
Regression lines of low level of mental health with the effect of moral judgement, intelligence and parental behaviour of school adolescents.

First of all, the effect of all the three independent variables, i.e., moral judgement, intelligence and parental behaviour was seen on low level
of mental health. The $R^2$ was .0444 which was not significant at any level of significance (Vide Table 7.1.4).

Further, in the second trial, the variable of parental behaviour with lowest t-value was deleted. The $R^2$ came to be .0420 which was significant at .05 level. However, out of the two no variable was significant at any level of significance.

Similarly, in the third trial, variable of intelligence with lowest t-value was deleted. In the final run equation $R^2$ was found to be .0326 which was significant at .01 level. Converting moral judgement to be a significant contributed towards low level of mental health at .05 level of the significance.

**Discussion of the Results**

On the basis of above, it can be concluded that moral judgement was the only one variable out of the three independent variables which had a significant contribution towards low level of mental health of school adolescents. The findings also indicate that the total prediction by the independent variables, i.e., moral judgement, intelligence and parental behaviour was 4.44% of variance towards low level of mental health. It means that the remaining 95.56% of variability remains unexplained. The results suggests that there are some other variable than moral judgement, intelligence and parental behaviour which may be highly related to low level of mental health.

Thus, the Hypothesis 1 (d), namely, “Significant variance towards low level of mental health of school adolescent would be contributed by major correlates such as moral judgement, intelligence and parental behaviour” stands partially accepted.
CONCLUSIONS

The analysis and interpretation of results presented in this chapter leads to the following conclusions:

1 (a) It was found that the moral judgement and intelligence are the causal factor in the variance of mental health of school adolescents whereas parental behaviour does not contribute to its total variance.

(b) It was found that the independent variables, i.e., intelligence and parental behaviour are not good predictors of high level of mental health whereas, moral judgement is the only causal factor in the variance of high level of mental health of school adolescents.

(c) It was found that the independent variables, i.e., moral judgement and parental behaviour are not good predictors of average level of mental health whereas, intelligence is the only causal factor in the variance of average level of mental health of school adolescents.

(d) It was found that the independent variables, i.e., intelligence and parental behaviour are not good predictors of low level of mental health whereas, moral judgement is the only causal factors in the variance of low level of mental health of school adolescents.