CHAPTER VI

Discussion of Results

The results obtained from the statistical analysis of the data are discussed here keeping in view the hypotheses of the present study. Efforts have been made to draw useful conclusions from and to assign psychological meanings to the interpretation of the results.

Correlations

All correlations between the predicting factors and the criteria of success in achievement are positive and significant beyond the 0.01 level. The correlations between scholastic achievement & intelligence (SA & I), scholastic achievement & emotional maturity (SA & EM) and scholastic achievement & socio-economic status (SA & SES) are 0.73, 0.66 and 0.26 respectively. There are minor variations, from these values in the relationships of the predictors with other criteria (public examination & internal evaluation) of success in achievement. These values of correlations, specially in case of internal evaluation are a little lower than the values given above. This may be due to the fact that in internal assessment, the performance of the subject is closely observed or the public examination has a little more positive effect on achievement owing to the special motive based on the feeling that it has a lasting effect on the career of the subject, and the capacities of the subject combine in a better way in its performance.

For 584 (586-2) degrees of freedom, the significant values of \( r \) at 0.05 and 0.01 levels are 0.084 and 0.109 respectively.
These are the maximum possible values of $r$ from the fluctuations of sampling alone if the population $r$ were actually zero. Since the obtained values of $r$'s are much higher than 0.109, they are significant beyond the 0.01 level. Moreover, the dependability of these coefficients of correlations in terms of their standard errors (Table 27) and Fisher's Z functions (Table 28) also show that the correlations are highly significant. Their confidence intervals being not very wide, these correlations are very stable at the 0.01 level.

The correlation between achievement and intelligence is highest; it correlates the second best with emotional maturity and it is lowest with that of the socio-economic status.

The significance of difference between two $r$'s in different combinations, as reported in Table 32, gives 2.37 as the critical ratio between $r_{12}$ (SA & I) and $r_{13}$ (SA & EM), and this is significant at the 0.05 level, but non-significant at the 0.01 level. The measurement of the significance of the difference by using Fisher's Z function between two $r$'s obtained from the same sample sometimes presents certain complications (Garrett & Woodworth, 1962). So in this case, Hotellings' $t$ test (Guilford, 1956) was also applied. The value of $t$ is 2.01 which is highly significant beyond the 0.01 level. Moreover, the differences between $r_{12}$ & $r_{14}$ (SA & SES) and $r_{13}$ & $r_{14}$ are also highly significant beyond the 0.01 level. So the correlations between SA & I, SA & EM and SA & SES markedly differ from each other.
The standard errors of the estimate for these three predictors (I, EM & SES) are 6.5, 7.2 and 9.2 respectively, whereas the coefficient of forecasting efficiency, in turn, for each is 32 per cent, 25 per cent and 4 per cent. The variance accounted for by intelligence is 53.29 per cent, that by emotional maturity it is 43.56 per cent and that by the socio-economic status it is 6.76 per cent. It means that intelligence accounts for the major portion of the variance of achievement and EM follows closely in the second place, the difference being of about 10 per cent. But the variance accounted for by SES is of the order of about 7 per cent only. This value is very low and indicates that in the democratic set up of the society, the socio-economic status of the family seems to have very little effect on the achievement of a learner.

High correlations between intelligence & achievement and emotional maturity & achievement suggest that there is much in common in these two predicting variables. This is further supported by high correlation between them. The low correlation between the socio-economic status & achievement implies that the two variables seem to some extent, independent of each other.

The correlations between sub-factors of SES and the criterion reveal that the occupation and elective position (MLA, sarpanch, etc.) of the siblings of the learner, the two sub-factors of SES, are negatively and insignificantly correlated with the scholastic achievement, but these factors are correlated positively and significantly with the public examination. The siblings' education and the parents' elective position also have an insignificant
relationship with the scholastic achievement. The relationship of
the parents' occupation with scholastic achievement is positive
and is significant only at the 0.05 level, whereas other factors
(the parents' education, family income, type of the house the family
lives in, the expenses on reading material, the vocational aspiration
and the material possessions) are positively and significantly
correlated with the scholastic achievement. Almost all factors
of SES are correlated positively and significantly with \( SA_1 \) (public
examination), except one factor, i.e. the parents' elective position,
which has a low and positive relationship with it. The factor of
siblings' occupation has a negative and insignificant relationship
with the internal assessment. The factors of the parents' occupation
and elective position and the siblings' elective position are correlated
positively but insignificantly with \( SA_2 \) (internal evaluation) and
the factor of the siblings' education is positively and significantly
correlated only at the 0.05 level with it. Other factors (the
parents' education, family income, type of the house, expenses on
reading material, vocational aspiration and material possessions)
are positively and significantly related with \( SA_2 \) beyond the 0.01
level.

The factors of the parent's education and the vocational
aspiration of the learner have the highest relationships with all
the three criteria of achievement. The family income, the type of
the house the family lives in and the expenses on the reading
material have also a good effect on the achievement. Material possessions,
e.g. chairs, tables and the parents' occupation come broadly at the third place. The education of the siblings have a good effect on the achievement in the public examination, which means that a learner gets inspiration or guidance from his brothers and sisters and other near relatives (who live together as one family unit) to aspire for a better status in life and to go in for a better career. It seems that the elective positions held by the parents or other members of the family have little or no effect on the success in scholastic achievement. Keeping in view the scholastic achievement only, it is clear that the self-urge in the learner to go in for better jobs has the highest effect on scholastic achievement. It seems that the parents' level of education does exert a good effect on learning, maybe, it is due to some sort of guidance from the parents to acquire better knowledge. The physical facilities (material possessions) at home also seem to have a good effect on achievement. The high correlations indicate that these sub-variables have some interdependence, and reverse is the case with low correlations.

The correlation between the predictors and the criterion of success in achievement for the categorised sample is positive and highly significant for all the strata of the sample, when the sample is split up into two, except between SA and SES for the category of girls in which case it is positive, low and insignificant (Table 28). When the sample is split up into four sub-groups, the
correlations between SA & I and SA & EM are positive and highly significant for all categories of samples. But the correlation between SA & SES is negative and insignificant for the category of urban girl's schools; it is positive and insignificant for the category of rural girl's schools and ninth-class girls, positive and significant at the 0.05 level only for the categories of rural boys' schools and tenth-class girls. For other categories (urban boys' schools, government boys' schools, private boys' schools, private girls' schools, ninth-class boys & tenth-class boys) it is positive and highly significant beyond the 0.01 level (Table 26).

The values of the correlations seem to differ a little between different pairs of combinations of the sample as is apparent, at the face of it, from the data presented in Tables 25 & 26. But the significance of difference between the pairs of correlations in different combinations for the categorized sample (Table 33) reveals that r's differ for the categories of government and private schools between SA & I, for the categories of ninth & tenth-class boys between SA & EM and for the categories of urban & rural boys' schools between SA & SES only at the 0.06 level. For the categories of boys' & girls' schools, the urban boys' and girls' schools and the government and private girls' schools the difference of r's between SA & SES is significant beyond the 0.01 level. For all other combinations of pairs of correlations of the sample, the differences are insignificant.
Inter-Correlations

Inter-correlations between predictors (between I & EM it is 0.45; between I & SES it is 0.19 and between EM & SES it is 0.17) are positive and significant beyond the 0.01 level, since these values are much higher than 0.084 & 0.109 values of r's for the fluctuations of sampling at the 0.05 and 0.01 levels. The dependability of these coefficients of correlations in terms of their standard errors and in terms of their Fisher's Z functions (Tables 27 & 28) show that the r between I & EM is highly stable beyond the 0.01 level. It is also stable at the 0.05 level between I & SES. The correlation does not seem to be very stable between EM & SES, the confidence interval being somewhat wide. Moreover, the differences between $r_{23}$ & $r_{24}$ and between $r_{23}$ & $r_{34}$ are highly significant, but the difference is non-significant between $r_{24}$ & $r_{34}$ even at the 0.05 level. In all other cases, the differences are highly significant. (Table 32,b)

The inter-correlations between the sub-factors of SES & intelligence and between the sub-factors of SES and EM (Table 31) reveal that the factor of siblings' occupation is negatively and insignificantly correlated with Intelligence, whereas in all other cases, the relationship is positive. But the factors of elective positions of the parents and the siblings are insignificantly end to a smaller extent correlated with intelligence. The sub-factors of SES best related with Intelligence...
are the learner's vocational aspiration and the parents' educational level. The siblings' occupation is negatively and insignificantly correlated with EM, whereas the siblings' elective position has a negative and significant relationship with it. In all other cases, the relationship is positive. The factors of the parents' occupation, the siblings' education, and the material possessions of the family are insignificant and to a smaller extent correlated with EM whereas the factor of the parents' elective position is correlated significantly with EM at the 0.05 level only. The best relating sub-factors of SES with EM are the vocational aspiration of the learner, the family income, the parents' education and the expenses on the reading-material, which have a good and significant bearing on EM.

The inter-correlations between I & EM are positive and highly significant beyond the 0.01 level for all categories of the sample (Tables 25 and 26). The correlations between I & SES are positive for all the categories, except for the category of urban girls' schools, when the sample is split up into four categories. Then the correlation is negative and insignificant. This relationship is insignificant for the category of girls' schools when the sample was split up into the strata of boys' and girls' schools. For the urban and tenth-class students, it is significant at the 0.05 level only. In all other categories of the samples (when the sample is split up into two), it is highly significant. This relationship is significant at the 0.05 level for the category
of rural boys' schools. It is insignificant for all the categories of
girls' schools. It is insignificant for all the categories of girls' 
schools when the sample is broken up into four parts each time. The 
correlation between EM & SES is negative, low and insignificant 
in respect of the categories of urban girls' schools and government 
girls' schools (Table 26), whereas in all other cases, it is 
positive. Table 25 shows that this relationship is insignificant 
for the category of girls' schools and is significant at the 0.05 
level for the category of government schools. In all other cases, 
it is significant beyond the 0.01 level. It is clear from Table 26 
that this relationship is insignificant for private girls' schools, 
ninth-class girls and tenth-class girls, and is significant at the 
0.05 level for the categories of rural boys' schools rural girls' 
schools, government boys' schools and tenth-class boys. In other 
cases (urban boys' schools, private boys' schools and ninth-class 
boys) it is significant beyond the 0.01 level. It is clear that in 
some cases, the value of the correlation is high but it is not 
significant at the given degrees of freedom, the sample having been 
broken up into small units.

The difference between two r's is significant at the 0.05 
level between intelligence and emotional maturity for the categories 
of government & private schools, between EM & SES for the categories 
of the urban boys' & girls' schools, between EM & SES for the 
categories of urban boys' & girls' schools and urban and rural girls' 
schools. In all other cases, the difference between two r's
is insignificant (Table 33).

The inter-correlation matrix, Table 40, also reveals some very interesting information relating to the variables used in the factor analysis. The negative inter-correlations in this study reveal divergent trends of many variables. The low relationships imply that the corresponding variables have very little in common or are quite independent of one another.

**Partial Correlations**

The partial correlations between the criterion of scholastic achievement and the predictors are positive and significant when the effect of correspondingly one variable or two variables is eliminated. The partial correlation between SA & I is 0.63 when the effect of emotional maturity is partialled out and it is 0.62 when the effect of both emotional maturity & socio-economic status is eliminated. The correlation is reduced from 0.73 to 0.63 with the elimination of the effect of emotional maturity, whereas there seems very little reduction in the value of r when the effect of socio-economic status is partialled out. This is supported by the fact that the value of partial r between SA & I is only reduced from 0.73 to 0.70 when the effect of socio-economic status is eliminated. The correlation between SA & EM comes down from 0.66 to 0.49 when the effect of intelligence is partialled out, and it is lowered from 0.66 to 0.62 when the
The effect of socio-economic status is eliminated. But when the effect of both I & SES is partialled out, the coefficient of correlation comes to 0.49. The coefficient of relationship between SA & SES is 0.26. It comes down to 0.18 when the effect of intelligence is eliminated and to 0.20 when that of emotional maturity is eliminated. Its value is further reduced to 0.16 when the effect of both I & EM is partialled out. These values of partial correlations are all significant at the 0.05 level and are stable except for $r_{14.23}$ which seems somewhat less stable, its confidence interval being wide (Table 35). These values speak of the dominating effect of intelligence on the achievement as compared with that of emotional maturity and socio-economic status. Intelligence alone accounts for 38.44 per cent of the variance, emotional maturity for 24.01 per cent and socio-economic status for 2.56 per cent. These values are in close proximity to the values derived from the solution of the regression equation (Table 37), allowing the effect of approximations in both the calculations.

Partial inter-correlations between predictors, when the effect of one or two variables is partialled out, are negative and non-significant for $r_{23.1}$ and $r_{23.14}$. In all other cases, the values are positive (Table 34). The values for $r_{24.1}$, $r_{24.13}$, $r_{34.1}$ and $r_{34.12}$ are insignificant and very low. In fact, all values of partial $r$'s are non-significant and low, where the
effect of achievement alone or in combination with other variables is eliminated. The value of $r_{34.2}$ is significant at the 0.05 level only, whereas in cases of $r_{23.4}$ & $r_{24.3}$, the values are stable and significant beyond the 0.01 level. The partial $r_{34.2}$ does not seem very stable, the confidence interval being quite wide.

Prediction of Achievement

Multiple correlations for the prediction of success in scholastic achievement with different combinations of variables (Table 36) are positive and greater than the zero-order correlation coefficients of different variables. All these values of $R$ are highly significant, the 0.05 confidence intervals for the population $r$'s being not wide. The best values of $R$ are obtainable (Table 36) by using the combination of variables of intelligence, emotional maturity and those factors of socio-economic status which are positively and significantly correlated with scholastic achievement. But nine variables being involved, the calculations become cumbersome and lengthy. Moreover, the $R$ obtained by combining intelligence, emotional maturity and socio-economic status does not differ significantly from the $R$ obtained by the combination of intelligence, emotional maturity and significantly positive relating factors of socio-economic status, as given above. So, for the development of multiple regression equations, the combination of variables of I, EM and SES are used.

The value of multiple correlation in the first
regression equation is 0.8. The standard error of estimation is 1.7 and the 0.05 level confidence interval for $R$ is 0.76 to 0.83 and for the 0.01 level, it is 0.77 to 0.84. This means that $R$ is highly significant. The coefficient of alienation is 0.59 and the coefficient of forecasting efficiency or dependability is 40.72 per cent. The coefficient of determination is 0.6486 and the variance accounted for is 64.86 per cent. The variance accounted for by intelligence is 39.90 per cent, by emotional maturity it is 23 per cent and by socio-economic status it is 1.96 per cent.

The value of $R$ in the second regression equation is 0.80. The confidence interval at the 0.05 level is 0.78 to 0.83 and at the 0.01 level, it is 0.77 to 0.84. This means that $R$ is highly significant. The standard error of estimation is 1.9 and the coefficient of alienation is 0.59. The coefficient of forecasting dependability is 40.64 per cent. The coefficient of determination is 0.6476 and the variance accounted for is 64.76 per cent. The variance accounted for by all predicting factors individually is: Intelligence 35.60%, emotional maturity 26.90% and socio-economic status 2.34%.

Multiple correlation for scholastic achievement, then derived from the combination of intelligence & emotional maturity is 0.80. There is very little difference between this $R$, and $R$ in the first regression equation (a difference of only 0.0013).
It is clear that socio-economic status has very little effect on the prediction of achievement. Results almost of the same dimensions could be derived without taking into consideration the factor of the socio-economic status of a subject. The variances accounted for by these R's also differ very insignificantly (a difference of only 0.22%). So the regression equations developed by combining the variables of intelligence and emotional maturity can also give equally good results.

In the first regression equation, the total variance accounted for is 64.86 per cent. It means that 35.14 per cent variance remains unaccounted for from the combination of these variables. So there are some other factors which have an effect on the achievement of a subject and which contribute to the residual variance, of course, allowing some portion of it to the defects in the measuring instruments and the method of measuring the variables in the present study. Accordingly the prediction of the multiple regression equation could further be improved by making the measuring instruments more exhaustive, effective and accurate. Some other fields could also be explored to provide for additional predicting factors to explain the residual variance.

Keeping all the facts and figures in view, it can, however, be claimed that the prediction of success in the scholastic achievement (by I, EM & SES) is fairly satisfactory. The Pearson product-moment correlation between predicted and obtained scores
for scholastic achievement is 0.85 and for public examination it is 0.84. Both these coefficients are significant beyond the 0.01 level. These values of the coefficients highly qualify the cross-validation. But it may be kept in mind that both the predicted and the obtained scores used for obtaining cross-validating coefficients are fallible. But this fact cannot be generalized. The validity coefficients can further be improved a little by using the attenuation technique and by improving the evaluation of intelligence, emotional maturity and socio-economic status of the learners. Anyhow, the regression equations developed could identify, with some margin of error, the learners who will do well in the scholastic achievement and in public examination from their intelligence, emotional maturity and socio-economic status scores. One thing that emerges from this study is that the emotional maturity factor of the learner needs special attention in our institutions. The details of syllabuses be worked out keeping in view the aspect of such factors as provide the maximum training for emotional maturity. The curriculum contents be enriched or adjusted in such a way as to provide maximum training for the emotional aspect of the learners, so that improvement can be brought out in the sphere of achievement and education.

**Factor Analysis**

After the rotated factor loadings have been obtained, an interesting next step is to identify the content and the nature
of the factors. This is done by inferring what variables with high loadings on a factor have in common that is present to a smaller degree in variables with moderate loadings and is absent from variables with the near-zero loadings.

Factor I.- Seven variables have significant loadings on factor I, out of which six variables have high loadings. All these variables relate to the environment which is dependent on the financial position of the parents. Low negative loadings of the variables of occupation and elective position (MLA, sarpanch etc.) of the siblings and other relatives also indicate that very direction. None of the variables with low loadings on this factor seems to require financial affluence of the parents. So this factor has been identified as a parental-affluence factor.

The loadings of different variables on factor I suggest that for the determination of the socio-economic status of a learner, four sub-variables (occupation, elective position of the siblings, the elective position of the parents and the vocational aspiration of the learner) do not contribute substantially to the determination of the socio-economic status and these variables can easily be dropped from the scale. High loadings of different variables on this factor suggest that these variables have a high relationship with one another. Loadings on this factor explain 23.60 per cent of the total variance.

Factor II.- This factor can very safely be named the proficiency
factor. Scholastic achievement, intelligence and emotional maturity have very high loadings on this factor. This implies that these variables are interdependent and have high correlations among one another. There seems to exist a common area between these variables. The low significant loadings of the sub-variables of the educational level of the parents and the vocational aspirations of the subject are in the expected direction, as they also affect the proficiency of the subject somewhat. On this factor, the loadings for the other sub-variables of the socio-economic status are low and non-significant. This suggests that these sub-variables of socio-economic status (except two mentioned above) are correlated with achievement, intelligence and emotional maturity to a small extent. This factor contributes 21.83 per cent to the total variance.

**Factor III.** - The positive high loadings on this factor are for the sub-variables (of socio-economic status) of occupation, educational level of the siblings. Loadings on this factor explain 8.47 per cent of the variance. These two sub-variables explain the influence of the brothers, sisters and other near relations on the subject. So this factor can be named as siblings influence factor. Low loadings of the income of the family sub-variable on this factor suggest that the siblings contribute very little to the income of the family. Very low or negative loadings of intelligence and achievement on this factor imply
that these variables (the occupation and the educational level of the siblings) do not contribute anything to intelligence and achievement of the subject. The low positive loading of emotional maturity on this factor indicates that the siblings' occupation and educational level contribute somewhat to the aspect of emotional-maturity in the subject.

**Factor IV.** From the high positive loading of the variable, 'elective position (MLA, Sarpanch, etc.) held by the parents', this factor can be named the parental elective position factor. From the significant negative loading of the variable 'vocational aspiration of the subject', it can be concluded that the vocational aspiration of the subject run counter to the elective position of the parents. Or, in other words, the wards of the persons who hold elective positions (MLA, Sarpanch, etc.) do not fare better in scholastic achievement. The negative loadings of achievement variables also indicate in the same direction. Moreover, the elective position of the parents does not in any way contribute to the development or growth of intelligence in their wards. The positive loading of the educational level of the siblings on this factor show that the elective position of the parents does have some relationship with the educational level of the brothers, sisters and other near relatives of the subject. Or, this variable helps to gain elective position (MLA, Sarpanch, etc.) by the parents. This factor contributes 7.20 per cent to the variance.
The high positive loading of the variable of 'elective position (MLA, saapanch, etc.) held by the siblings' on this factor clearly establishes this factor as the siblings elective position factor. This factor contributes 7 per cent to the variance. The negative but significant loading of the variable 'vocational aspiration of the subject' points out that these two variables oppose each other, and have nothing in common. The negative insignificant loadings of emotional maturity and scholastic achievement on this factor imply that the elective position held by the siblings does not contribute anything to the sphere of emotional maturity and scholastic achievement of the subject. Mostly, negative or very low loadings of other variables indicate that this sub-factor of socio-economic status is independent of the other sub-factor of SES.

From the perusal of the statistical treatment and the discussion of the results, vis-a-vis hypotheses of this study, it is revealed that first hypothesis stands partially rejected to the extent that intelligence and emotional maturity do not contribute equally to the success in scholastic achievement. Both these variables do contribute substantially to the success in scholastic achievement but these relationships differ significantly from one another. Second hypothesis stands accepted. A statistically significant and close relationship does exist between intelligence and emotional maturity. Third hypothesis also stands partially rejected to the extent that a close or high relationship does not exist between the socio-economic status and the scholastic achievement, although this relationship is statistically significant.
Summing up the information revealed by this study, it may be stated that:

(1) Intelligence and emotional maturity contribute substantially to success in scholastic achievement. The contribution of intelligence to success in scholastic achievement is better than that of emotional maturity and much better than that of socio-economic status.

(2) A close and significantly high relationship exists between intelligence and emotional maturity.

(3) The relationship between the socio-economic status and the scholastic achievement, though statistically significant, is not very high.

(4) The relationships between the scholastic achievement and intelligence, between the scholastic achievement and emotional maturity, and between the scholastic achievement and socio-economic status differ very significantly from one another. The correlation between achievement and intelligence is the highest, whereas it is the lowest between achievement and socio-economic status.

(5) The high relationship between emotional maturity and the scholastic achievement suggests that the curriculum contents of a young learner should be re-evaluated to such an extent as to include such items of the subject-matter which provide for the best training of the emotional aspect. Guidance in
education should be given on such lines as to gear up the saturation of the emotional aspect of the learner, so that his scholastic achievement is ultimately improved and bettered.

(6) The extent of the relationship of scholastic achievement with the socio-economic status shows that whatever is the socio-economic position of a learner, his achievement is better related to other factors which need the attention of the educator, although the socio-economic status has also a definite bearing on achievement.

(7) The socio-economic status has a positive effect on emotional maturity, especially the factors of parent education, the family income, the type of the house a family lives in, the expenses on the reading-material in the family (i.e., the cultural level of the family) and the vocational aspirations of the learner.

(8) The relationship between the scholastic achievement and intelligence is higher in case of the students of private schools than in the case of those of government schools. This may be due to the fact that better attention is given to the students by the teachers in private schools.

(9) The higher relationship between scholastic achievement and emotional maturity in case of boys of the ninth class as compared with that for the boys of the tenth
class suggests that boy students studying for public examination are emotionally less stable or are more anxiety-ridden than those studying for the internal examination of the ninth class. This suggests that public examinations should be reduced to the minimum and promotions be related to internal evaluation.

The effect of socio-economic status on the scholastic achievement of girls is more striking. It might be due to the fact that girls from poor families are to devote more time to help their parents in the discharge of day-to-day domestic work.

Factor I named 'parental-affluence factor' indicates that the socio-economic status of the subject mainly consists of the parental financial affluence. Such other sub-variables as the occupation and the educational level of the siblings, the parents' elective position, etc. contribute very little to the determination of the socio-economic status.

Factor II named 'proficiency factor' seems to relate to ability dependent on intelligence and emotional maturity along with scholastic achievement.

Factor III 'named'siblings' influence factor' describes a less important aspect of the socio-economic status in terms of extraneous influence of occupation and educational level of the brothers,
sisters and other near relatives of the subject.

Factors IV 'parental elective position factor' & V 'siblings elective position factor' describe other remaining aspects of the socio-economic status which are grouped together and which are of a less important nature. The discrepancy of communalities and reliabilities of different variables, especially those of intelligence test and emotional maturity scale (for which these values are known), give room for some other factors to account for the differences thereof.