Chapter V

Data Analysis
And
Results
CHAPTER-V
DATA ANALYSIS AND RESULTS

The description of scores on Mathematical Cognitive Skills (Total scores and scores of each of the individual Mathematical Cognitive Skills viz. Skill of Knowing, Skill of Understanding, Skill of Analysis, Skill of Applying and Skill of Solving) in relation to Stress (Academic Stress and Social Stress), Educational Aspirations and Socio-Economic Status has been presented in the following paragraphs.

Descriptive statistics provide a method of quantifying the characteristics of the data, how broadly the data spread and how one aspect of the data is related to another aspect of the same data. To fulfil the purpose of the study and to minimise the errors in the sampling, an adequate and representative sample that seemed essential was collected. Before presenting the actual pertaining to the hypotheses advanced in this study, the description of the nature of data in respect of variables i.e. Mathematical Cognitive Skills (Total scores and scores of each of the individual Mathematical Cognitive Skills viz. Skill of Knowing, Skill of Understanding, Skill of Analysis, Skill of Applying and Skill of Solving) in relation to Stress (Academic Stress and Social Stress), Educational Aspirations and Socio-Economic Status have been analysed to ensure that the condition of basic assumptions in the statistical techniques are satisfied. In the large samples, assumptions like the normality of the distribution of the scores were not always necessary. When approximately the same numbers of people are there in each group, the normality of assumption is less critical.

The analyses have been reported in two sections. Each section focuses on descriptive and inferential statistical techniques. Section I presents analysis on Total scores of Mathematical Skills and scores on each of the individual Mathematical Cognitive Skills (viz: Skill of Knowing, Skill of Understanding, Skill of Analysis, Skill of Applying and Skill of Solving) in relation to Stress, Educational Aspirations and Socio-Economic Status. The first section deals with all above mentioned analysis with Academic Stress and second section revolves round analysis with Social Stress as an independent variable. The other two variables Educational Aspirations and Socio-Economic Status remain constant in both the sections.
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SECTION I

5.1: ANALYSIS ON MATHEMATICAL COGNITIVE SKILLS (TOTAL SCORES AND SCORES ON EACH OF THE INDIVIDUAL MATHEMATICAL COGNITIVE SKILLS) IN RELATION TO ACADEMIC STRESS, EDUCATIONAL ASPIRATIONS AND SOCIO-ECONOMIC STATUS

5.1.1: ANALYSIS ON TOTAL SCORES OF MATHEMATICAL COGNITIVE SKILLS

Both descriptive and inferential analyses were done on the Total scores of Mathematical Cognitive Skills.

5.1.1.1: Descriptive Analysis on Mathematical Cognitive Skills (Total Scores) with Academic Stress, Educational Aspirations and Socio-Economic Status

Table 5.1.1 shows that mean values (M) of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Academic Stress were 42.87, 43.15 and 44.12 respectively. It indicated that the average Total Scores of X graders with High, Average and Low Academic Stress were not equal. The mean Scores of X graders with Low Academic Stress were highest among the mean scores of X graders with High and Average Academic Stress. The Standard Deviation (SD)
of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Academic Stress were 12.60, 13.43 and 15.96 respectively. The results indicated that Total scores of X graders with Low Academic Stress had yielded the most diversity. Skewness (Sk) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Academic Stress were 0.380, 0.431 and 0.496 respectively, which indicated that the distribution for Total Scores of X graders with High, Average and Low Academic Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of the Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Academic Stress were -0.197, -0.176 and -0.384 respectively, which indicated that the distribution for Total scores of X graders with High, Average and Low Academic Stress were Leptokurtic but more so, in case of Low Academic Stress.

Table 5.T.1 shows that mean values (M) of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were 45.77, 44.22 and 40.15 respectively. It indicated that the average Total Scores of X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were 14.82, 14.08 and 12.65 respectively. The results indicated that Total scores of X graders with High Educational Aspirations had yielded the most diversity. Skewness (Sk) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were 0.395, 0.452 and 0.476 respectively, which indicated that the distribution for Total Scores of X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of the Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were -0.459, -0.182 and 0.161 respectively, which indicated that the distribution for Total scores of X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.
Table 5.T.1 shows that mean values (M) of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were 51.79, 41.03 and 37.32 respectively. It indicated that the average Total Scores of X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were 14.71, 11.80 and 11.20 respectively. The results indicated that Total scores of X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were 0.187, 0.366 and 0.168 respectively, which indicated that the distribution for Total Scores of X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of the Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were -0.648, -0.437 and -0.743 respectively, which indicated that the distribution for Total scores of X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of Low Socio-Economic Status.

Figure 5.F.1: Mean Values on Total Scores of Mathematical Cognitive Skills for X graders in Relation to Academic Stress, Educational Aspirations and Socio-Economic Status

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Since the differences in mean values of Mathematical Cognitive Skills (Total scores) of X graders in relation to Academic Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to 3×3×3 ANOVA on Total scores of Mathematical Cognitive Skills of X graders.

5.1.1.2: 3×3×3 ANOVA on Mathematical Cognitive Skills (Total Scores) in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a 3×3×3 design. The summary of 3×3×3 design has been presented in the Table 5.T.2 below:

Table 5.T.2

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares(S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares(M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Main Effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Academic Stress</td>
<td>168.4</td>
<td>2</td>
<td>84.2</td>
<td>0.56</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>3333</td>
<td>2</td>
<td>1666.5</td>
<td>11.13**</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>22375.2</td>
<td>2</td>
<td>11187.6</td>
<td>74.77**</td>
</tr>
<tr>
<td>• Two Order Interactions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A×B</td>
<td>666.7</td>
<td>4</td>
<td>166.675</td>
<td>1.11</td>
</tr>
<tr>
<td>B×C</td>
<td>1741.4</td>
<td>4</td>
<td>435.35</td>
<td>2.91*</td>
</tr>
<tr>
<td>C×A</td>
<td>2654.1</td>
<td>4</td>
<td>663.525</td>
<td>4.43**</td>
</tr>
<tr>
<td>• Three Order Interaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A×B×C</td>
<td>1480.5</td>
<td>8</td>
<td>185.0625</td>
<td>1.24</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>84829.4</td>
<td>567</td>
<td>149.61093</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>117248.7</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

• Main Effect: Academic Stress (A)

Table 5.T.2 shows that the F-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Academic Stress was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference between the mean of Total Scores
on Mathematical Cognitive Skills for X graders of High, Average and Low Academic Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀₁ which stated that \textit{X graders having High, Average and Low Academic Stress will not be significantly different on the Total Scores of Mathematical Cognitive Skills} was not rejected at the specified level. It may be concluded that \textit{X graders having High, Average and Low Academic Stress achieved equal Total mean scores on Mathematical Cognitive Skills}.

- \textbf{Main Effect: Educational Aspirations (B)}

\textit{Table 5.T.2} shows that the F-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference between the means of Total scores on Mathematical Cognitive Skills for X graders of High, Average and Low Educational Aspirations groups. The null hypothesis H₀₂ which stated that \textit{X graders having High, Average and Low Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills} was rejected at the specified level. It may be inferred that the three groups of X graders were different on their Total Scores of Mathematical Cognitive Skills. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following \textit{Table 5.T.3}.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
Educational Aspirations(B) & High Level (B1) & Average Level(B2) & Low Level(B3) \\
\hline
N & 198 & 198 & 198 \\
M & 45.77 & 44.22 & 40.15 \\
S.D.(σ) & 14.82 & 14.08 & 12.65 \\
\hline
High Level (B1) & - & 1.06 & 4.07** \\
Average Level (B2) & - & - & 3.03** \\
Low Level (B3) & - & - & - \\
\hline
\end{tabular}
\caption{Means, SD’s and t-ratios for Difference in Total Scores for High, Average and Low Levels of Educational Aspirations}
\end{table}

\* Significant at 0.05 level of confidence

\** Significant at 0.01 level of confidence
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Following sub-hypotheses were tested through these t-ratios:

**H₀2.1:** X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

**H₀2.2:** X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

**H₀2.3:** X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

Table 5.T.3 shows that the t-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders with High (B1) and Average (B2) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis **H₀2.1** which stated that *X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills* was not rejected at the specified level. It may be concluded that *X graders having High and Average Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills.*

As shown in Table 5.T.3, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis **H₀2.2** which stated that *X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills* was therefore rejected at the specified level. A probe into the means led to infer that the mean achievement of X graders with High Educational Aspirations (M=45.77) was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations (M=40.15).

In Table 5.T.3, the t-ratio for the difference in means of the Total Scores on Mathematical Cognitive Skills for X graders with Average (B2) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis
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H₀₂.₃ which stated that *X graders having Average (B₂) and Low (B₃) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills* was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with Average Educational Aspirations (M=44.22) was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations (M=40.15).

- **Main Effect C: Socio-Economic Status**

  Table 5.T.2 shows that the F-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference between the mean Total Scores on Mathematical Cognitive Skills for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis H₀₃ which stated that *X graders having High, Average and Low Socio-Economic Status will not be significantly different on the Total scores of Mathematical Cognitive Skills* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their Total Scores of Mathematical Cognitive Skills. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.4.

**Table 5.T.4**

Means, SD’s and t-ratios for Difference in Total Scores for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>51.79</td>
<td>41.03</td>
<td>37.32</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td>14.71</td>
<td>11.80</td>
<td>11.20</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>8.02**</td>
<td>11.04**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>3.22**</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence
* Significant at 0.05 level of confidence
Following sub-hypotheses were tested through these t-ratios:

$H_03.1$: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

$H_03.2$: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

$H_03.3$: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

In Table 5.T.4, the t-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders with High (C1) and Average (C2) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_03.1$ which stated that $X$ graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with High Socio-Economic Status ($M=51.79$) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Socio-Economic Status ($M=41.03$).

As shown in Table 5.T.4, the t-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_03.2$ which stated that $X$ graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with High Socio-Economic Status ($M=51.79$) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status ($M=37.32$).
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In Table 5.T.4, the t-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders with Average (C2) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{03.3}$ which stated that X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with Average Socio-Economic Status ($M=41.03$) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status ($M=37.32$).

- **Two Order Interaction:**

  **Academic Stress × Educational Aspirations (A×B)**

  Table 5.T.2 shows that the F-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Academic Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress and Educational Aspirations did not yield significantly different means on Total Scores of Mathematical Cognitive Skills for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{04}$ which stated that there will be no significant interaction effect of Academic Stress and Educational Aspirations on the Total Scores of Mathematical Cognitive Skills for X graders was not rejected at the specified level. It may be concluded that Academic Stress and Educational Aspirations did not yield different means of Total scores on Mathematical Cognitive Skills for X graders.

- **Two Order Interaction:**

  **Educational Aspirations × Socio-Economic Status (B×C)**

  Table 5.T.2 shows that the F-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was found to be significant at the
0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status yielded significantly different means on Total Scores of Mathematical Cognitive Skills for X graders. The null hypothesis $H_{05}$ which stated that there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on the Total scores of Mathematical Cognitive Skills for X graders was rejected at the specified level. It may be inferred that the various combination groups of X graders (B1-B2, B1-B3, B1-C1, B1-C2, B1-C3, B2-B3, B2-C1, B2-C2, B2-C3, B3-C1, B3-C2, B3-C3, C1-C2, C1-C3 and C2-C3) were different beyond chance factors on their Total Scores of Mathematical Cognitive Skills. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.5.

<table>
<thead>
<tr>
<th>Groups</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>45.77</td>
<td>44.22</td>
<td>40.15</td>
<td>51.79</td>
<td>41.03</td>
<td>37.32</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>14.82</td>
<td>14.08</td>
<td>12.65</td>
<td>14.71</td>
<td>11.80</td>
<td>11.20</td>
</tr>
<tr>
<td>B1</td>
<td>-</td>
<td>1.06</td>
<td>4.07**</td>
<td>4.06**</td>
<td>3.53**</td>
<td>6.40**</td>
</tr>
<tr>
<td>B2</td>
<td>-</td>
<td>-</td>
<td>3.03**</td>
<td>5.25**</td>
<td>2.45*</td>
<td>5.43**</td>
</tr>
<tr>
<td>B3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8.49**</td>
<td>0.72</td>
<td>2.35*</td>
</tr>
<tr>
<td>C1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8.02**</td>
<td>11.04**</td>
</tr>
<tr>
<td>C2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.22**</td>
</tr>
<tr>
<td>C3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
*Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

$H_{5.1}$: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

$H_{5.2}$: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

$H_{5.3}$: X graders having High Educational Aspirations (B1) and High Socio-Economic Status (C1) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

$H_{5.4}$: X graders having High Educational Aspirations (B1) and Average Socio-Economic Status (C2) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.
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H₀5.5: X graders having High Educational Aspirations (B₁) and Low Socio-Economic Status (C₃) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.6: X graders having Average (B₂) and Low (B₃) Educational Aspirations will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.7: X graders having Average Educational Aspirations (B₂) and High Socio-Economic Status (C₁) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.8: X graders having Average Educational Aspirations (B₂) and Average Socio-Economic Status (C₂) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.9: X graders having Average Educational Aspirations (B₂) and Low Socio-Economic Status (C₃) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.10: X graders having Low Educational Aspirations (B₃) and High Socio-Economic Status (C₁) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.11: X graders having Low Educational Aspirations (B₃) and Average Socio-Economic Status (C₂) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.12: X graders having Low Educational Aspirations (B₃) and Low Socio-Economic Status (C₃) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.13: X graders having High (C₁) and Average (C₂) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.14: X graders having High (C₁) and Low (C₃) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

H₀5.15: X graders having Average (C₂) and Low (C₃) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

As shown in Table 5.T.5, the t-ratios for the difference in the means of Total scores of Mathematical Cognitive Skills for X graders were found to be significant at the 0.01 level of confidence for the following combination groups viz:

❖ B₁-B₃, B₁-C₁, B₁-C₂, B₁-C₃, B₂-B₃, B₂-C₁, B₂-C₃, B₃-C₁, C₁-C₂, C₁-C₃ and C₂-C₃

Similarly, t-ratios for the difference in the means of Total Scores of Mathematical Cognitive Skills for the groups B₂-C₂ and B₃-C₃ were found to be significant at the 0.05 level of confidence. This indicated that all these groups were different in their mean scores beyond any chance factors. Therefore the corresponding hypotheses H₀5.₂, H₀5.₃, H₀5.₄, H₀5.₅, H₀5.₆, H₀5.₇, H₀5.₈, H₀5.₉, H₀5.₁₀, H₀5.₁₂, 

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H_{0.13}, H_{0.14} and H_{0.15} were rejected at the specified levels. An examination of means of the two groups in each of the above mentioned combination groups led to the following conclusions:

- High Educational Aspirations Group (B1) was higher on means of Total scores on Cognitive Skills in Mathematics (M=45.77) as compared to their counterparts (Group B3) of Low Educational Aspirations group (M=40.15). Therefore, H_{0.2} was rejected.
- High Socio-Economic Status Group (C1) performed higher on means of Total scores on Mathematical Cognitive Skills (M=51.79) as compared to High Educational Aspirations Group (B1) (M=45.77). Therefore, H_{0.3} was rejected.
- High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=45.77) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, H_{0.4} was rejected.
- High Educational Aspirations Group (B1) achieved higher means on Total scores of Cognitive Skills in Mathematics (M=45.77) as compared to their counterparts in Group of X graders with Low Socio-Economic Status (C3) (M=37.32). Therefore, H_{0.5} was rejected.
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.22) than their counterparts in Low Educational Aspirations Group (B3) (M=40.15). Therefore, H_{0.6} was rejected.
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=51.79) than their counterparts in Average Educational Aspirations (B2) (M=44.22). Therefore, H_{0.7} was rejected.
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.22) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, H_{0.8} was rejected.
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.22) than their counterparts in
Data Analysis And Results

Low Socio-Economic Status Group (C3) (M=37.32). Therefore, H₀⁵.⁹ was rejected.

- High Socio-Economic Status Group (C₁) achieved higher means on Total scores of Mathematical Cognitive Skills (M=51.79) than their counterparts in Low Educational Aspirations Group (B₃) (M=40.15). Therefore, H₀⁵.¹⁰ was rejected.

- Low Educational Aspirations Group (B₃) achieved higher means on Total scores of Mathematical Cognitive Skills (M=40.15) than their counterparts in Low Socio-Economic Status Group (C₃) (M=37.32). Therefore, H₀⁵.₁² was rejected.

- High Socio-Economic Status Group (C₁) achieved higher means on Total scores of Mathematical Cognitive Skills (M=51.79) than their counterparts in Average Socio-Economic Status Group (C₂) (M=41.03). Therefore, H₀⁵.¹³ was rejected.

- High Socio-Economic Status Group (C₁) achieved higher means on Total scores of Mathematical Cognitive Skills (M=51.79) than their counterparts in Low Socio-Economic Status Group (C₃) (M=37.32). Therefore, H₀⁵.¹₄ was rejected.

- Average Socio-Economic Status Group (C₂) achieved higher means on Total scores of Mathematical Cognitive Skills (M=41.03) than their counterparts in Low Socio-Economic Status Group (C₃) (M=37.32). Therefore, H₀⁵.₁₅ was rejected.

However, t-ratios for the difference in means of Total scores on Mathematical Cognitive Skills for X graders in the following combination groups were not found to be significant even at the 0.05 level of confidence. These groups were:

- B₁-B₂ and B₃-C₂

The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses H₀⁵.¹ and H₀⁵.¹₁ were not rejected at the specified level. An examination of means on Mathematical Cognitive Skills of each of these combination groups led to the following conclusions:

- Mean of Total scores on Mathematical Cognitive Skills of X graders with High Educational Aspirations (B₁) and that of those in Average Educational Aspirations (B₂) were not different. Therefore, H₀ ⁵.¹ was not rejected.
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- Low Educational Aspirations group (B3) of X graders and that of Average Socio-Economic Status (C2) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, \( H_{0.11} \) was not rejected.

- Two Order Interaction:

Socio-Economic Status \( \times \) Academic Stress (C\( \times \)A)

Table 5.T.2 shows that the F-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Socio-Economic Status and Academic Stress was found to be significant at the 0.01 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Academic Stress yielded significantly different means of Total Scores on Mathematical Cognitive Skills for X graders. The null hypothesis \( H_{0.6} \) which stated that there will be no significant interaction effect of Socio-Economic Status and Academic Stress on the Total scores of Mathematical Cognitive Skills for X graders was rejected at the specified level. It may be inferred that the various combination groups of X graders (C1-C2, C1-C3, C1-A1, C1-A2, C1-A3, C2-C3, C2-A1, C2-A2, C2-A3, C3-A1, C3-A2, C3-A3, A1-A2, A1-A3 and A2-A3) were different on their Total Scores of Mathematical Cognitive Skills beyond chance. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following table.

Table 5.T.6

<table>
<thead>
<tr>
<th>Groups</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>51.79</td>
<td>41.03</td>
<td>37.32</td>
<td>42.87</td>
<td>43.15</td>
<td>44.12</td>
</tr>
<tr>
<td>S.D. (( \sigma ))</td>
<td>14.71</td>
<td>11.80</td>
<td>11.20</td>
<td>12.60</td>
<td>13.43</td>
<td>15.96</td>
</tr>
<tr>
<td>C1</td>
<td>-</td>
<td>8.02**</td>
<td>11.04**</td>
<td>6.51**</td>
<td>6.12**</td>
<td>4.98**</td>
</tr>
<tr>
<td>C2</td>
<td>-</td>
<td>-</td>
<td>3.22**</td>
<td>1.51</td>
<td>1.66</td>
<td>2.19**</td>
</tr>
<tr>
<td>C3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4.66**</td>
<td>4.70**</td>
<td>4.92**</td>
</tr>
<tr>
<td>A1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.21</td>
<td>0.86</td>
</tr>
<tr>
<td>A2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.65</td>
</tr>
<tr>
<td>A3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence
* Significant at 0.05 level of confidence
Following sub-hypotheses were tested through these t-ratios:

\( H_{0.1} \): X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.2} \): X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.3} \): X graders having High Socio-Economic Status (C1) and High Academic Stress (A1) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.4} \): X graders having High Socio-Economic Status (C1) and Average Academic Stress (A2) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.5} \): X graders having High Socio-Economic Status (C1) and Low Academic Stress (A3) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.6} \): X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.7} \): X graders having Average Socio-Economic Status (C2) and High Academic Stress (A1) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.8} \): X graders having Average Socio-Economic Status (C2) and Average Academic Stress (A2) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.9} \): X graders having Average Socio-Economic Status (C2) and Low Academic Stress (A3) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.10} \): X graders having Low Socio-Economic Status (C3) and High Academic Stress (A1) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.11} \): X graders having Low Socio-Economic Status (C3) and Average Academic Stress (A2) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.12} \): X graders having Low Socio-Economic Status (C3) and Low Academic Stress (A3) will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.13} \): X graders having High (A1) and Average (A2) Academic Stress will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.14} \): X graders having High (A1) and Low (A3) Academic Stress will not be significantly different on the Total Scores of Mathematical Cognitive Skills.

\( H_{0.15} \): X graders having Average (A2) and Low (A3) Academic Stress will not be significantly different on the Total Scores of Mathematical Cognitive Skills.
As shown in Table 5.T.6, the t-ratios for the difference in the means of Total scores on Mathematical Cognitive Skills for X graders were found to be significant at the 0.01 level of confidence for the following combination groups viz:

❖ C1-C2, C1-C3, C1-A1, C1-A2, C1-A3, C2-C3, C3-A1, C3-A2 and C3-A3

Similarly, t-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for the group (C2-A3) was found to be significant at the 0.05 level of confidence. This indicated that all these groups were different in their mean scores beyond any chance factors. Therefore the corresponding hypotheses \( H_{06.1}, H_{06.2}, H_{06.3}, H_{06.4}, H_{06.5}, H_{06.6}, H_{06.9}, H_{06.10}, H_{06.11} \) and \( H_{06.12} \) were rejected at the specified levels. An examination of means of the two groups in each of the above mentioned combination groups led to the following conclusions:

• High Socio-Economic Status Group (C1) was higher on means of Total scores on Cognitive Skills in Mathematics (\( M=51.79 \)) as compared to their counterparts (Group C2) of Average Socio-Economic Status group (\( M=41.03 \)). Therefore, \( H_{06.1} \) was rejected.

• High Socio-Economic Status Group (C1) performed higher means on Total scores of Mathematical Cognitive Skills (\( M=51.79 \)) as compared to Low Socio-Economic Status Group (C3) (\( M=37.32 \)). Therefore, \( H_{06.2} \) was rejected.

• High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills (\( M=51.79 \)) than their counterparts in High Academic Stress Group (A1) (\( M=42.87 \)). Therefore, \( H_{06.3} \) was rejected.

• High Socio-Economic Status Group (C1) achieved higher means on Total scores of Cognitive Skills in Mathematics (\( M=51.79 \)) as compared to their counterparts in Group of X graders with Average Academic Stress (A2) (\( M=43.15 \)). Therefore, \( H_{06.4} \) was rejected.

• High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills (\( M=51.79 \)) than their counterparts in Low Academic Stress Group (A3) (\( M=44.12 \)). Therefore, \( H_{06.5} \) was rejected.

• Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills (\( M=41.03 \)) than their counterparts in
Data Analysis And Results

Low Socio-Economic Status Group (C3) \((M=37.32)\). Therefore, \(H_{06.6}\) was rejected.

- Low Academic Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills \((M=44.12)\) than their counterparts in Average Socio-Economic Status Group (C2) \((M=41.03)\). Therefore, \(H_{06.9}\) was rejected.

- High Academic Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills \((M=42.87)\) than their counterparts in Low Socio-Economic Status Group (C3) \((M=37.32)\). Therefore, \(H_{06.10}\) was rejected.

- Average Academic Stress Group (A2) achieved higher means on Total scores of Mathematical Cognitive Skills \((M=43.15)\) than their counterparts in Low Socio-Economic Status Group (C3) \((M=37.32)\). Therefore, \(H_{06.11}\) was rejected.

The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses \(H_{06.7}, H_{06.8}, H_{06.13}, H_{06.14}\) and \(H_{06.15}\) were not rejected at the specified level. An examination of means on Mathematical Cognitive Skills of each of these combination groups led to the following conclusions:

- Mean of Total scores on Mathematical Cognitive Skills of X graders with Average Socio-Economic Status (C2) and that of those in High Academic Stress (A1) were not different. Therefore, \(H_{06.7}\) was not rejected.

However, t-ratios for the difference in means of Total scores on Mathematical Cognitive Skills of X graders in the following combination groups were not found to be significant even at the 0.05 level of confidence. These groups were:


The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses \(H_{06.7}, H_{06.8}, H_{06.13}, H_{06.14}\) and \(H_{06.15}\) were not rejected at the specified level. An examination of means on Mathematical Cognitive Skills of each of these combination groups led to the following conclusions:

- Mean of Total scores on Mathematical Cognitive Skills of X graders with Average Socio-Economic Status (C2) and that of those in High Academic Stress (A1) were not different. Therefore, \(H_{06.7}\) was not rejected.
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- Average Socio-Economic Status group (C2) of X graders and that of Average Academic Stress (A2) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_{0.6.8}$ was not rejected.
- X graders having High (A1) and Average (A2) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_{0.6.13}$ was not rejected.
- X graders having High (A1) and Low (A3) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_{0.6.14}$ was not rejected.
- X graders having Average (A2) and Low (A3) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_{0.6.15}$ was not rejected.

- Three Order Interaction:

  **Academic Stress \times \text{Educational Aspirations} \times \text{Socio-Economic Status} (A \times B \times C)**

  Table 5.1.2 shows that the F-ratio for the difference in the means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Academic Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means on Total Scores of Mathematical Cognitive Skills for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{0.7}$ which stated that there will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on the Total scores of Mathematical Cognitive Skills for X graders was not rejected at the specified level. It may be concluded that the three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different means of Total scores on Mathematical Cognitive Skills for X graders.
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5.1.2: ANALYSIS ON SCORES FOR SKILL OF KNOWING

A similar set of analysis was applied on individual scores for Skill of Knowing.

5.1.2.1: Descriptive Analysis of Scores on Skill of Knowing with Academic Stress, Educational Aspirations and Socio-Economic Status

Table 5.T.7

Mean, Standard Deviation, Skewness and Kurtosis on Scores of Skill of Knowing with Academic stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>High</td>
<td>198</td>
<td>40.36</td>
<td>13.14</td>
<td>0.457</td>
<td>-0.367</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>39.87</td>
<td>13.91</td>
<td>0.579</td>
<td>-0.334</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>40.95</td>
<td>15.24</td>
<td>0.673</td>
<td>-0.012</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>43.00</td>
<td>14.76</td>
<td>0.406</td>
<td>-0.485</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>40.69</td>
<td>14.16</td>
<td>0.659</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>37.49</td>
<td>12.85</td>
<td>0.673</td>
<td>0.119</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>45.65</td>
<td>15.65</td>
<td>0.461</td>
<td>-0.589</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>39.59</td>
<td>12.68</td>
<td>0.478</td>
<td>-0.545</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>35.94</td>
<td>12.02</td>
<td>0.393</td>
<td>-0.580</td>
</tr>
</tbody>
</table>

Table 5.T.7 shows that mean values (M) of the Scores on Skill of Knowing for X graders with High, Average and Low Academic Stress were 40.36, 39.87 and 40.95 respectively. It indicated that the average of the Scores on Skill of Knowing for X graders with High, Average and Low Academic Stress were not equal. The mean Scores of X graders with Low Academic Stress were highest among the mean scores of X graders with High and Average Academic Stress. The Standard Deviation (SD) of the Scores on Skill of Knowing for X graders with High, Average and Low Academic Stress were 13.14, 13.91 and 15.24 respectively. The results indicated that the Scores on Skill of Knowing for X graders with Low Academic Stress had yielded the most diversity. Skewness (Sk) value of the Scores on Skill of Knowing for X graders with High, Average and Low Academic Stress were 0.457, 0.579 and 0.673 respectively, which indicated that the distribution for the Scores on Skill of Knowing for X graders with High, Average and Low Academic Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of the Scores on Skill of Knowing for X graders with High, Average and Low Academic...
Stress were -0.367, -0.334 and -0.012 respectively, which indicated that the distribution for the Scores on Skill of Knowing for X graders with High, Average and Low Academic Stress were Leptokurtic but more so, in case of High Academic Stress.

Table 5.1.7 shows that mean values (M) of the Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were 43.00, 40.69 and 37.49 respectively. It indicated that the average of the Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of the Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were 14.76, 14.16 and 12.85 respectively. The results indicated that the Scores on Skill of Knowing for X graders with High Educational Aspirations had yielded the most diversity. Skewness (Sk) value of the Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were 0.406, 0.659 and 0.673 respectively, which indicated that the distribution for the Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of the Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were -0.485, 0.003 and 0.119 respectively, which indicated that the distribution for the Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.1.7 shows that mean values (M) of the Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were 45.65, 39.59 and 35.94 respectively. It indicated that the average of the Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of the Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were 15.65, 12.68 and 12.02 respectively. The results indicated that the Scores on Skill of Knowing for X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status.
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Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of the Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were 0.461, 0.478 and 0.393 respectively, which indicated that the distribution for the Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of the Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were -0.589, -0.545 and -0.580 respectively, which indicated that the distribution for the Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.

![Mean Values on the Scores of Skill of Knowing for X graders in Relation to Academic Stress, Educational Aspirations and Socio-Economic Status](image)

Since the differences in mean values of the Scores on Skill of Knowing for X graders in relation to Academic Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to 3×3×3 ANOVA on the Scores of Skill of Knowing for X graders.
5.1.2.2: 3×3×3 ANOVA on Scores of Skill of Knowing in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a 3×3×3 design. The summary of 3×3×3 design has been presented in the Table 5.1.2 below:

Table 5.1.2

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares(M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Academic Stress</td>
<td>116</td>
<td>2</td>
<td>58</td>
<td>0.32</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>3027</td>
<td>2</td>
<td>1513.5</td>
<td>8.38**</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>9531.4</td>
<td>2</td>
<td>4765.7</td>
<td>26.41**</td>
</tr>
<tr>
<td><strong>Two Order Interactions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A×B</td>
<td>274.8</td>
<td>4</td>
<td>68.7</td>
<td>0.38</td>
</tr>
<tr>
<td>B×C</td>
<td>1181.1</td>
<td>4</td>
<td>295.275</td>
<td>1.63</td>
</tr>
<tr>
<td>C×A</td>
<td>787.8</td>
<td>4</td>
<td>196.95</td>
<td>1.09</td>
</tr>
<tr>
<td><strong>Three Order Interactions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A×B×C</td>
<td>831.1</td>
<td>8</td>
<td>103.8875</td>
<td>0.57</td>
</tr>
<tr>
<td><strong>Error: Within Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>118046.3</td>
<td>593</td>
<td>180.41817</td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

- **Main Effect : Academic Stress (A)**

Table 5.1.2 shows that the F-ratio for the difference in means of Scores on Skill of Knowing for X graders with High, Average and Low Academic Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference between the mean of Scores on Skill of Knowing for X graders of High, Average and Low Academic Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ which stated that $X$ graders having High, Average and Low Academic Stress will not be significantly different on Scores of Skill of Knowing was not rejected at the specified
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level. It may be concluded that X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Knowing.

- **Main Effect : Educational Aspirations (B)**

  Table 5.T.8 shows that the F-ratio for the difference in means of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference between the mean of Scores on Skill of Knowing for X graders of High, Average and Low Educational Aspirations groups. The null hypothesis H09 which stated that X graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Knowing was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of Skill of Knowing. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.9.

**Table 5.T.9**

Means, SD’s and t-ratios for difference in scores of Skill of Knowing for High, Average and Low Levels of Educational Aspirations

<table>
<thead>
<tr>
<th>Educational Aspirations (B)</th>
<th>High Level (B1)</th>
<th>Average Level (B2)</th>
<th>Low Level (B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>43.00</td>
<td>40.69</td>
<td>37.49</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>14.76</td>
<td>14.16</td>
<td>12.85</td>
</tr>
<tr>
<td>High Level (B1)</td>
<td>-</td>
<td>1.59</td>
<td>3.96**</td>
</tr>
<tr>
<td>Average Level (B2)</td>
<td>-</td>
<td>-</td>
<td>2.37**</td>
</tr>
<tr>
<td>Low Level (B3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

H09.1: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

H09.2: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

H09.3: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

Table 5.T.9 shows that the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with High (B1) and Average (B2) Educational
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Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0.1$ which stated that $X$ graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Knowing was not rejected at the specified level. It may be concluded that $X$ graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Knowing.

As shown in Table 5.T.9, the t-ratio for the difference in means of Scores on Skill of Knowing for $X$ graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis $H_0.2$ which stated that $X$ graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of $X$ graders with High Educational Aspirations ($M=43.00$) was higher on scores of Skill of Knowing than their counterparts with Low Educational Aspirations ($M=37.49$).

In Table 5.T.9, the t-ratio for the difference in scores on Skill of Knowing for $X$ graders with Average (B2) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that mean scores of students with Average and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis $H_0.3$ which stated that $X$ graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of $X$ graders with Average Educational Aspirations ($M=40.69$) was higher on scores of Skill of Knowing than their counterparts with Low Educational Aspirations ($M=37.49$).

- **Main Effect C: Socio-Economic Status**

  Table 5.T.8 shows that the F-ratio for the difference in means of Scores on Skill of Knowing for $X$ graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was
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significant difference between the mean of Scores on Skill of Knowing for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis $H_0^{10}$ which stated that *X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Knowing* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of skill of Knowing. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.10.

Table 5.T.10
Means, SD’s and t-ratios for difference in Scores of Skill of Knowing for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>45.65</td>
<td>39.59</td>
<td>35.94</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td>15.65</td>
<td>12.68</td>
<td>12.02</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>4.23**</td>
<td>6.93**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>2.94**</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

$H_0^{10.1}$: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing.

$H_0^{10.2}$: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing.

$H_0^{10.3}$: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing.

In Table 5.T.10, the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with High (C1) and Average (C2) Socio-Economic Status was found to be significant at 0.01 level of confidence. This indicated that mean scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_0^{10.1}$ which stated that *X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing* was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=45.65) was higher on scores of.
Skill of Knowing than their counterparts with Average Socio-Economic Status (M=39.59).

As shown in Table 5.T.10, the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{010.2}$ which stated that X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=45.65) was higher on scores of Skill of Knowing than their counterparts with Low Socio-Economic Status (M=35.94).

In Table 5.T.10, the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with Average (C2) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that mean scores of students with Average and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{010.3}$ which stated that X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Average Socio-Economic Status (M=39.59) was higher on scores of Skill of Knowing than their counterparts with Low Socio-Economic Status (M=35.94).

- **Two Order Interaction:**

  **Academic Stress × Educational Aspirations (A×B)**

  Table 5.T.8 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders due to the interaction between Academic Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress and Educational Aspirations did not yield significantly different means on scores of Skill of Knowing for X graders. The difference if observed may be ascribed to chance

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factors only. The null hypothesis $H_01$ which stated that *there will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of Skill of Knowing for X graders* was not rejected at the specified level. It may be concluded that Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Knowing for X graders.

- Two Order Interaction:

  **Educational Aspirations × Socio-Economic Status (B×C)**

  Table 5.T.8 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Knowing for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_02$ which stated that *there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Knowing for X graders* was not rejected at the specified level. It may be concluded that Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Knowing for X graders.

- Two Order Interaction:

  **Socio-Economic Status × Academic Stress (C×A)**

  Table 5.T.8 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders due to the interaction between Socio-Economic Status and Academic Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Academic Stress did not yield significantly different means on the scores of Skill of Knowing for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_03$ which stated that *there will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of Skill of Knowing for X graders* was not rejected at the specified level. It may be concluded that Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Knowing for X graders.
Three Order Interaction:

**Academic Stress × Educational Aspirations × Socio-Economic Status**

(A×B×C)

Table 5.7.8 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders due to the interaction between Academic Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Knowing for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0 \) which stated that there will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Knowing for X graders was not rejected at the specified level. It may be concluded that the three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Knowing for X graders.

### 5.1.3: ANALYSIS ON SCORES FOR SKILL OF UNDERSTANDING

A similar set of analysis was applied on individual scores for Skill of Understanding.

#### 5.1.3.1: Descriptive Analysis of Scores on Skill of Understanding with Academic Stress, Educational Aspirations and Socio-Economic Status

Table 5.7.11

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Stress</strong></td>
<td>High</td>
<td>198</td>
<td>39.66</td>
<td>13.87</td>
<td>0.444</td>
<td>-0.377</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>39.09</td>
<td>13.53</td>
<td>0.412</td>
<td>-0.483</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>40.00</td>
<td>16.20</td>
<td>0.521</td>
<td>-0.572</td>
</tr>
<tr>
<td><strong>Educational Aspirations</strong></td>
<td>High</td>
<td>198</td>
<td>41.04</td>
<td>15.56</td>
<td>0.430</td>
<td>-0.643</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>40.28</td>
<td>14.93</td>
<td>0.399</td>
<td>-0.640</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>37.41</td>
<td>12.88</td>
<td>0.524</td>
<td>0.038</td>
</tr>
<tr>
<td><strong>Socio-Economic Status</strong></td>
<td>High</td>
<td>198</td>
<td>46.64</td>
<td>15.46</td>
<td>0.197</td>
<td>-0.742</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>37.27</td>
<td>13.41</td>
<td>0.435</td>
<td>-0.654</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>34.82</td>
<td>11.88</td>
<td>0.409</td>
<td>-0.620</td>
</tr>
</tbody>
</table>
Table 5.T.11 shows that mean values (M) of Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress were 39.66, 39.09 and 40.00 respectively. It indicated that the average of Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress were not equal. The mean Scores of X graders with Low Academic Stress were highest among the mean scores of X graders with High and Average Academic Stress. The Standard Deviation (SD) of Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress were 13.87, 13.53 and 16.20 respectively. The results indicated that Scores on Skill of Understanding for X graders with Low Academic Stress had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress were 0.444, 0.412 and 0.521 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress were -0.377, -0.483 and -0.572 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress were Leptokurtic but more so, in case of Low Academic Stress.

Table 5.T.11 shows that mean values (M) of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were 41.04, 40.28 and 37.41 respectively. It indicated that the average of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were 15.56, 14.93 and 12.88 respectively. The results indicated that Scores on Skill of Understanding for X graders with High Educational Aspirations had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were 0.430, 0.399 and 0.524 respectively.
respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were -0.643, -0.640 and 0.038 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.T.11 shows that mean values (M) of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were 46.64, 37.27 and 34.82 respectively. It indicated that the average of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were 15.46, 13.41 and 11.88 respectively. The results indicated that Scores on Skill of Understanding for X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were 0.197, 0.435 and 0.409 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were -0.742, -0.654 and -0.620 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.
5.1.3.2: 3×3×3 ANOVA on Scores of Skill of Understanding in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a 3×3×3 design. The summary of 3×3×3 design has been presented in the Table 5.T.12 below:
**Table 5.T.12**

Sum of Squares, Mean Sum of Squares and F-ratio for the Scores on Skill of Understanding in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares(M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Academic Stress</td>
<td>83.6</td>
<td>2</td>
<td>41.8</td>
<td>0.22</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>1448.9</td>
<td>2</td>
<td>724.45</td>
<td>3.88**</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>15407.1</td>
<td>2</td>
<td>7703.55</td>
<td>41.30**</td>
</tr>
<tr>
<td><strong>Two Order Interactions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A×B</td>
<td>349.3</td>
<td>4</td>
<td>87.325</td>
<td>0.46</td>
</tr>
<tr>
<td>B×C</td>
<td>405.9</td>
<td>4</td>
<td>101.475</td>
<td>0.54</td>
</tr>
<tr>
<td>C×A</td>
<td>1368.4</td>
<td>4</td>
<td>342.1</td>
<td>1.83</td>
</tr>
<tr>
<td><strong>Three Order Interaction:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A×B×C</td>
<td>1004</td>
<td>8</td>
<td>125.5</td>
<td>0.67</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>105749.1</td>
<td>567</td>
<td>186.50635</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>125816.3</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence**

- **Main Effect : Academic Stress (A)**

  Table 5.T.12 shows that the F-ratio for the difference in means of Scores on Skill of Understanding for X graders with High, Average and Low Academic Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference between the mean of Scores on Skill of Understanding for X graders of High, Average and Low Academic Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ which stated that **X graders having High, Average and Low Academic Stress will not be significantly different on Scores of Skill of Understanding** was not rejected at the specified level. It may be concluded that **X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Understanding.**

- **Main Effect : Educational Aspirations (B)**

  Table 5.T.12 shows that the F-ratio for the difference in means of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Understanding for
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X graders of High, Average and Low Educational Aspirations groups. The null hypothesis $H_0$ which stated that *X graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Understanding* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of Skill of Understanding. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.13.

**Table 5.T.13**

Means, SD's and t-ratios for difference in scores on Skill of Understanding for High, Average and Low Levels of Educational Aspirations

<table>
<thead>
<tr>
<th>Educational Aspirations (B)</th>
<th>High Level (B1)</th>
<th>Average Level (B2)</th>
<th>Low Level (B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>41.04</td>
<td>40.28</td>
<td>37.41</td>
</tr>
<tr>
<td>S.D.( o)</td>
<td>15.56</td>
<td>14.93</td>
<td>12.88</td>
</tr>
<tr>
<td>High Level (B1)</td>
<td>-</td>
<td>0.49</td>
<td>2.53*</td>
</tr>
<tr>
<td>Average Level (B2)</td>
<td>-</td>
<td>-</td>
<td>2.05*</td>
</tr>
<tr>
<td>Low Level (B3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

- $H_0$16.1: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.
- $H_0$16.2: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.
- $H_0$16.3: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.

Table 5.T.13 shows that the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (B1) and Average (B2) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$16.1 which stated that *X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Understanding* was not rejected at the specified level. It may be concluded that X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Understanding.

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As shown in Table 5.T.13, the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis $H_0$16.2 which stated that X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with High Educational Aspirations ($M=41.04$) was higher on scores of Skill of Understanding than their counterparts with Low Educational Aspirations ($M=37.41$).

In Table 5.T.13, the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with Average (B2) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis $H_0$16.3 which stated that X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with Average Educational Aspirations ($M=40.28$) was higher on scores of Skill of Understanding than their counterparts with Low Educational Aspirations ($M=37.41$).

- **Main Effect: Socio-Economic Status (C)**

Table 5.T.12 shows that the F-ratio for the difference in means of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Understanding for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis $H_0$17 which stated that X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Understanding was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores on skill of Understanding. To ascertain which groups of X graders were significantly different from each other, t-
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test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.14.

Table 5.T.14
Means, SD's and t-ratios for difference in scores of Skill of Understanding for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>46.64</td>
<td>37.27</td>
<td>34.82</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>15.46</td>
<td>13.41</td>
<td>11.88</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>6.46**</td>
<td>8.56**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>1.92</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

H₀17.1: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding.
H₀17.2: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding.
H₀17.3: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding.

In Table 5.T.14, the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (C1) and Average (C2) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis H₀17.1 which stated that X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=46.64) was higher on scores of Skill of Understanding than their counterparts with Average Socio-Economic Status (M=37.27).

As shown in Table 5.T.14, the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (C1) and Low (C3) Socio-Economic

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Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_0^{17.2}$ which stated that *X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding* was therefore rejected at the specified level. A probe into the means led to conclude that the mean achievement of X graders with High Socio-Economic Status ($M=46.64$) was higher on scores of Skill of Understanding than their counterparts with Low Socio-Economic Status ($M=34.82$).

Table 5.T.14 shows that the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with Average (C2) and Low (C3) Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{17.3}$ which stated that *X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding* was not rejected at the specified level. It may be concluded that X graders having Average and Low Socio-Economic Status achieved equal mean scores on the Skill of Understanding.

- **Two Order Interaction:**

  **Academic Stress $\times$ Educational Aspirations (A$\times$B)**

  Table 5.T.12 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders due to the interaction between Academic Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress and Educational Aspirations did not yield significantly different means on scores of Skill of Understanding for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{18}$ which stated that *there will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of Skill of Understanding for X graders* was not rejected at the specified level. It may be concluded that Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Understanding for X graders.
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- **Two Order Interaction:**
  
  **Educational Aspirations \times Socio-Economic Status (B\times C)**
  
  Table 5.T.12 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Understanding for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_{019} \) which stated that there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Understanding for X graders was not rejected at the specified level. It may be concluded that Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Understanding for X graders.

- **Two Order Interaction:**
  
  **Socio-Economic Status \times Academic Stress (C\times A)**
  
  Table 5.T.12 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders due to the interaction between Socio-Economic Status and Academic Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Academic Stress did not yield significantly different means on scores of Skill of Understanding for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_{020} \) which stated that there will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of Skill of Understanding for X graders was not rejected at the specified level. It may be concluded that Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Understanding for X graders.

- **Three Order Interaction:**
  
  **Academic Stress \times Educational Aspirations \times Socio-Economic Status (A\times B\times C)**
  
  Table 5.T.12 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders due to the interaction between Academic Stress, Educational Aspirations and Socio-Economic Status was not found to be significant
even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Understanding for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0 \) which stated that there will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Understanding for X graders was not rejected at the specified level. It may be concluded that the three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different scores on Skill of Understanding for X graders.

### 5.1.4: ANALYSIS ON SCORES FOR SKILL OF ANALYSIS

Scores on Skill of Analysis were considered separately and descriptive & inferential statistical analyses were done.

#### 5.1.4.1: Descriptive Analysis of Scores on Skill of Analysis with Academic Stress, Educational Aspirations and Socio-Economic Status

Table 5.T.15

Mean, Standard Deviation, Skewness and Kurtosis of Scores on Skill of Analysis with Academic stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>High</td>
<td>198</td>
<td>35.74</td>
<td>13.50</td>
<td>0.486</td>
<td>-0.431</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>36.12</td>
<td>14.07</td>
<td>0.633</td>
<td>-0.102</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>34.83</td>
<td>14.48</td>
<td>0.621</td>
<td>-0.371</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>37.37</td>
<td>15.37</td>
<td>0.496</td>
<td>-0.488</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>35.69</td>
<td>13.70</td>
<td>0.542</td>
<td>-0.401</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>33.63</td>
<td>12.64</td>
<td>0.588</td>
<td>-0.262</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>41.97</td>
<td>16.10</td>
<td>0.146</td>
<td>-0.862</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>33.05</td>
<td>11.76</td>
<td>0.503</td>
<td>-0.324</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>31.67</td>
<td>11.42</td>
<td>0.507</td>
<td>-0.670</td>
</tr>
</tbody>
</table>

Table 5.T.15 shows that mean values (M) of Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress were 35.74, 36.12 and 34.83 respectively. It indicated that the average of Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress were not equal. The mean Scores of X graders with Average Academic Stress were highest among the mean scores of X graders with High and Low Academic Stress. The Standard Deviation (SD) of

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 Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress were 13.50, 14.07 and 14.48 respectively. The results indicated that Scores on Skill of Analysis for X graders with Low Academic Stress had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress were 0.486, 0.633 and 0.621 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress were -0.431, -0.102 and -0.371 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress were Leptokurtic but more so, in case of High Academic Stress.

 Table 5.T.15 shows that mean values (M) of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were 37.37, 35.69 and 33.63 respectively. It indicated that the average of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The **Standard Deviation (SD)** of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were 15.37, 13.70 and 12.64 respectively. The results indicated that Scores on Skill of Analysis for X graders with High Educational Aspirations had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were 0.496, 0.542 and 0.588 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were -0.488, -0.401 and -0.262 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

 Table 5.T.15 shows that mean values (M) on Scores of Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were 41.97, 33.05 and
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31.67 respectively. It indicated that the average of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The **Standard Deviation (SD)** of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were 16.10, 11.76 and 11.42 respectively. The results indicated that Scores on Skill of Analysis for X graders with High Socio-Economic Status had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were 0.146, 0.503 and 0.507 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were -0.862, -0.324 and -0.670 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.

Figure 5.F.4: Mean Values on Scores of Skill of Analysis for X graders in Relation to Academic Stress, Educational Aspirations and Socio-Economic Status

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Since the differences in mean values on scores of Skill of Analysis for X graders in relation to Academic Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to $3 \times 3 \times 3$ ANOVA on Scores of Skill of Analysis for X graders.

5.1.4.2: $3 \times 3 \times 3$ ANOVA on Scores of Skill of Analysis in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a $3 \times 3 \times 3$ design. The summary of $3 \times 3 \times 3$ design has been presented in the Table 5.T.16 below:

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Main Effects: A: Academic Stress</td>
<td>174.6</td>
<td>2</td>
<td>87.3</td>
<td>0.49</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>1395</td>
<td>2</td>
<td>697.5</td>
<td>3.95*</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>12380.2</td>
<td>2</td>
<td>6190.1</td>
<td>35.08**</td>
</tr>
<tr>
<td>• Two Order Interactions: A×B</td>
<td>105.9</td>
<td>4</td>
<td>26.475</td>
<td>0.15</td>
</tr>
<tr>
<td>B×C</td>
<td>976.2</td>
<td>4</td>
<td>244.05</td>
<td>1.38</td>
</tr>
<tr>
<td>C×A</td>
<td>873.9</td>
<td>4</td>
<td>218.475</td>
<td>1.23</td>
</tr>
<tr>
<td>• Three Order Interaction: A×B×C</td>
<td>519.8</td>
<td>8</td>
<td>64.975</td>
<td>0.36</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>100030.3</td>
<td>567</td>
<td>176.42028</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>116455.9</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence   *Significant at 0.05 level of confidence

- **Main Effect: Academic Stress (A)**

Table 5.T.16 shows that the F-ratio for the difference in means of Scores on Skill of Analysis for X graders with High, Average and Low Academic Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there
was no significant difference in means of Scores on Skill of Analysis for X graders of High, Average and Low Academic Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{022}$ which stated that X graders having High, Average and Low Academic Stress will not be significantly different on Scores of Skill of Analysis was not rejected at the specified level. It may be concluded that X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Analysis.

**Main Effect: Educational Aspirations (B)**

Table 5.T.16 shows that the F-ratio for the difference in means of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.05 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Analysis for X graders of High, Average and Low Educational Aspirations groups. The null hypothesis $H_{023}$ which stated that X graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Analysis was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of Skill of Analysis. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.17.

**Table 5.T.17**

Means, SD’s and t-ratios for difference in scores on Skill of Analysis for High, Average and Low Levels of Educational Aspirations

<table>
<thead>
<tr>
<th>Educational Aspirations (B)</th>
<th>High Level (B1)</th>
<th>Average Level (B2)</th>
<th>Low Level (B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>37.37</td>
<td>35.69</td>
<td>33.63</td>
</tr>
<tr>
<td>S.D.( σ)</td>
<td>15.37</td>
<td>13.70</td>
<td>12.64</td>
</tr>
<tr>
<td>High Level (B1)</td>
<td>-</td>
<td>1.15</td>
<td>2.65**</td>
</tr>
<tr>
<td>Average Level (B2)</td>
<td>-</td>
<td>-</td>
<td>1.56</td>
</tr>
<tr>
<td>Low Level (B3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of confidence**

Following sub-hypotheses were tested through these t-ratios:

$H_{023.1}$: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Analysis.

$H_{023.2}$: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis.
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$H_0^{23.3}$: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis.

Table 5.T.17 shows that the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with High (B1) and Average (B2) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{23.1}$ which stated that *X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Analysis* was not rejected at the specified level. It may be concluded that *X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Analysis.*

As shown in Table 5.T.17, the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis $H_0^{23.2}$ which stated that *X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis* was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Educational Aspirations ($M=37.37$) was higher on scores of Skill of Analysis than their counterparts with Low Educational Aspirations ($M=33.63$).

Table 5.T.17 shows that the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with Average (B2) and Low (B3) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{23.3}$ which stated that *X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis* was not rejected at the specified level. It may be concluded that *X graders having Average and Low Educational Aspirations achieved equal mean scores on Skill of Analysis.*
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- **Main Effect: Socio-Economic Status (C)**

  Table 5.T.16 shows that the F-ratio for the difference in means of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Analysis for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis $H_0$ which stated that 

  \[
  X \text{ graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Analysis}
  \]

  was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores on skill of Analysis. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.18.

Table 5.T.18

Means, SD's and t-ratios for difference in scores on Skill of Analysis for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>41.97</td>
<td>33.05</td>
<td>31.67</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td>16.10</td>
<td>11.76</td>
<td>11.42</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>6.32**</td>
<td>7.35**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>1.18</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence
* Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

- $H_{0.1}$: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis.
- $H_{0.2}$: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis.
- $H_{0.3}$: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis.

In Table 5.T.18, the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with High (C1) and Average (C2) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean
scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{024.1}$ which stated that $X$ graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of $X$ graders with High Socio-Economic Status ($M=41.97$) was higher on scores of Skill of Analysis than their counterparts with Average Socio-Economic Status ($M=33.05$).

As shown in Table 5.T.18, the t-ratio for the difference in means of Scores on Skill of Analysis for $X$ graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{024.2}$ which stated that $X$ graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of $X$ graders with High Socio-Economic Status ($M=41.97$) was higher on scores of Skill of Analysis than their counterparts with Low Socio-Economic Status ($M=31.67$).

Table 5.T.18 shows that t-ratio for the difference in means of Scores on Skill of Analysis for $X$ graders with Average (C2) and Low (C3) Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{024.3}$ which stated that $X$ graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis was not rejected at the specified level. It may be concluded that $X$ graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Analysis.

- **Two Order Interaction:**

**Academic Stress × Educational Aspirations (A×B)**

Table 5.T.16 shows that the F-ratio for the difference in means of scores on Skill of Analysis for $X$ graders due to the interaction between Academic Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress and
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Educational Aspirations did not yield significantly different means on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0^{25} \) which stated that *there will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of Skill of Analysis for X graders* was not rejected at the specified level. It may be concluded that *Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Analysis for X graders.*

- **Two Order Interaction:**

  **Educational Aspirations \( \times \) Socio-Economic Status (B\( \times \)C)**

  Table 5.T.16 shows that the F-ratio for the difference in means of scores on Skill of Analysis for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0^{26} \) which stated that *there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Analysis for X graders* was not rejected at the specified level. It may be concluded that *Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Analysis for X graders.*

- **Two Order Interaction:**

  **Socio-Economic Status \( \times \) Academic Stress (C\( \times \)A)**

  Table 5.T.16 shows that the F-ratio for the difference in means of scores on Skill of Analysis for X graders due to the interaction between Socio-Economic Status and Academic Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Academic Stress did not yield significantly different means on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0^{27} \) which stated that *there will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of Skill of Analysis for X graders* was not rejected at the specified level. It may be concluded that *Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Analysis for X graders.*

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- Three Order Interaction:
  Academic Stress × Educational Aspirations × Socio-Economic Status
  
  (A×B×C)

  Table 5.T.16 shows that the F-ratio for the difference in means of scores on Skill of Analysis for X graders due to the interaction between Academic Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{28}$ which stated that there will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Analysis for X graders was not rejected at the specified level. It may be concluded that the three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different scores on Skill of Analysis for X graders.

### 5.1.5: ANALYSIS ON SCORES FOR SKILL OF APPLYING

Scores on Skill of Applying were considered separately and descriptive & inferential statistical analyses were done.

#### 5.1.5.1: Descriptive Analysis of Scores on Skill of Applying with Academic Stress, Educational Aspirations and Socio-Economic Status

Table 5.T.19

Mean, Standard Deviation, Skewness and Kurtosis of Scores on Skill of Applying with Academic stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>High</td>
<td>198</td>
<td>34.34</td>
<td>13.02</td>
<td>0.460</td>
<td>-0.528</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>33.39</td>
<td>12.53</td>
<td>0.420</td>
<td>-0.667</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>34.17</td>
<td>12.46</td>
<td>0.424</td>
<td>-0.497</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>35.61</td>
<td>13.15</td>
<td>0.278</td>
<td>-0.861</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>33.20</td>
<td>12.54</td>
<td>0.493</td>
<td>-0.462</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>33.11</td>
<td>12.17</td>
<td>0.535</td>
<td>-0.215</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>34.91</td>
<td>13.87</td>
<td>0.492</td>
<td>-0.571</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>34.56</td>
<td>12.35</td>
<td>0.368</td>
<td>-0.579</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>32.44</td>
<td>11.58</td>
<td>0.304</td>
<td>-0.969</td>
</tr>
</tbody>
</table>

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Table 5.T.19 shows that mean values (M) of Scores on Skill of Applying for X graders with High, Average and Low Academic Stress were 34.34, 33.39 and 34.17 respectively. It indicated that the average of Scores on Skill of Applying for X graders with High, Average and Low Academic Stress were not equal. The mean Scores of X graders with High Academic Stress were highest among the mean scores of X graders with Average and Low Academic Stress. The Standard Deviation (SD) of Scores on Skill of Applying for X graders with High, Average and Low Academic Stress were 13.02, 12.53 and 12.46 respectively. The results indicated that Scores on Skill of Applying for X graders with High Academic Stress had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Applying for X graders with High, Average and Low Academic Stress were 0.460, 0.420 and 0.424 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Academic Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Applying for X graders with High, Average and Low Academic Stress were -0.528, -0.667 and -0.497 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Academic Stress were Leptokurtic but more so, in case of Average Academic Stress.

Table 5.T.19 shows that mean values (M) of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were 35.61, 33.20 and 33.11 respectively. It indicated that the average of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were 13.15, 12.54 and 12.17 respectively. The results indicated that Scores on Skill of Applying for X graders with High Educational Aspirations had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were
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Aspirations were 0.278, 0.493 and 0.535 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were -0.861, -0.462 and -0.215 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.T.19 shows that mean values (M) of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were 34.91, 34.56 and 32.44 respectively. It indicated that the average of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were 13.87, 12.35 and 11.58 respectively. The results indicated that Scores on Skill of Applying for X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were 0.492, 0.368 and 0.304 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were -0.571, -0.579 and -0.969 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of Low Socio-Economic Status.
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A: Academic Stress  B: Educational Aspirations  C: Socio-Economic Status

Figure 5.F.5: Mean Values on Scores of Skill of Applying for X graders in Relation to Academic Stress, Educational Aspirations and Socio-Economic Status

Since the differences in mean values of Scores on Skill of Applying for X graders in relation to Academic Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to 3×3×3 ANOVA on Scores of Skill of Applying for X graders.

5.1.5.2: 3×3×3 ANOVA on Scores of Skill of Applying in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a 3×3×3 design. The summary of 3×3×3 design has been presented in the Table 5.T.20 below:
Data Analysis And Results

Table 5.T.20
Sum of Squares, Mean Sum of Squares and F-ratio for Scores on Skill of Applying in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Main Effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Academic Stress</td>
<td>101.4</td>
<td>2</td>
<td>50.7</td>
<td>0.31</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>796.1</td>
<td>2</td>
<td>398.05</td>
<td>2.48</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>708.3</td>
<td>2</td>
<td>354.15</td>
<td>2.21</td>
</tr>
<tr>
<td>• Two Order Interactions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A*B</td>
<td>161.5</td>
<td>4</td>
<td>40.375</td>
<td>0.25</td>
</tr>
<tr>
<td>B*C</td>
<td>819.9</td>
<td>4</td>
<td>204.975</td>
<td>1.28</td>
</tr>
<tr>
<td>C*A</td>
<td>846.9</td>
<td>4</td>
<td>211.725</td>
<td>1.32</td>
</tr>
<tr>
<td>• Three Order Interaction:</td>
<td>A<em>B</em>C</td>
<td>1006.3</td>
<td>8</td>
<td>125.7875</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>90688.3</td>
<td>567</td>
<td>159.94409</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95128.7</td>
<td>593</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence *Significant at 0.05 level of confidence

- **Main Effect : Academic Stress (A)**
  Table 5.T.20 shows that the F-ratio for the difference in means of Scores on Skill of Applying for X graders with High, Average and Low Academic Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Applying for X graders of High, Average and Low Academic Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis H029 which stated that X graders having High, Average and Low Academic Stress will not be significantly different on Scores of Skill of Applying was not rejected at the specified level. It may be concluded that X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Applying.

- **Main Effect : Educational Aspirations (B)**
  Table 5.T.20 shows that the F-ratio for the difference in means of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Applying for X graders of High, Average and Low Educational Aspirations groups.
The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{0,30}$ which stated that \textit{X graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Applying} was not rejected at the specified level. It may be concluded that \textit{X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Applying}.

- **Main Effect: Socio-Economic Status (C)**

  Table 5.T.20 shows that the F-ratio for the difference in means of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Applying for X graders of High, Average and Low Socio-Economic Status groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{0,31}$ which stated that \textit{X graders having High, Average and Low Socio-Economic Status will not be significantly different on Scores of Skill of Applying} was not rejected at the specified level. It may be concluded that \textit{X graders having High, Average and Low Socio-Economic Status achieved equal mean scores on Skill of Applying}.

- **Two Order Interaction:**

  \textit{Academic Stress $\times$ Educational Aspirations (A$\times$B)}

  Table 5.T.20 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Academic Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress and Educational Aspirations did not yield significantly different means on scores of Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{0,32}$ which stated that \textit{there will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of Skill of Applying for X graders} was not rejected at the specified level. It may be concluded that \textit{Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Applying for X graders}.  

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- **Two Order Interaction:**
  **Educational Aspirations × Socio-Economic Status (B×Q)**

  Table 5.T.20 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_{33} \) which stated that there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Applying for X graders was not rejected at the specified level. It may be concluded that Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Applying for X graders.

- **Two Order Interaction:**
  **Socio-Economic Status × Academic Stress (CxA)**

  Table 5.T.20 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Socio-Economic Status and Academic Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Academic Stress did not yield significantly different means on scores of Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_{34} \) which stated that there will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of Skill of Applying for X graders was not rejected at the specified level. It may be concluded that Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Applying for X graders.

- **Three Order Interaction:**
  **Academic Stress × Educational Aspirations × Socio-Economic Status (A×B×C)**

  Table 5.T.20 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Academic Stress, Educational Aspirations and Socio-Economic Status was not found to be significant.
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even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means of scores on Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0: \text{there will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Applying for X graders}$ was not rejected at the specified level. It may be concluded that the three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Applying for X graders.

5.1.6: ANALYSIS ON SCORES FOR SKILL OF SOLVING

Scores on Skill of Solving were considered separately and descriptive & inferential statistical analyses were done.

5.1.6.1: Descriptive Analysis of Scores on Skill of Solving with Academic Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>High</td>
<td>198</td>
<td>31.67</td>
<td>12.34</td>
<td>0.455</td>
<td>-0.436</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>32.46</td>
<td>12.52</td>
<td>0.549</td>
<td>-0.517</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>30.78</td>
<td>11.79</td>
<td>0.735</td>
<td>0.104</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>32.45</td>
<td>11.67</td>
<td>0.459</td>
<td>-0.476</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>32.22</td>
<td>13.03</td>
<td>0.619</td>
<td>-0.246</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>30.25</td>
<td>11.85</td>
<td>0.628</td>
<td>-0.328</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>33.14</td>
<td>13.02</td>
<td>0.464</td>
<td>-0.477</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>32.28</td>
<td>12.48</td>
<td>0.564</td>
<td>-0.371</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>29.50</td>
<td>10.80</td>
<td>0.597</td>
<td>-0.341</td>
</tr>
</tbody>
</table>

Table 5.7.21 shows that mean values (M) of Scores on Skill of Solving for X graders with High, Average and Low Academic Stress were 31.67, 32.46 and 30.78 respectively. It indicated that the average of Scores on Skill of Solving for X graders with High, Average and Low Academic Stress were not equal. The mean Scores of X graders with Average Academic Stress were highest among the mean scores of X graders with High and Low Academic Stress. The Standard Deviation (SD) of
Scores on Skill of Solving for X graders with High, Average and Low Academic Stress were 12.34, 12.52 and 11.79 respectively. The results indicated that Scores on Skill of Solving for X graders with Average Academic Stress had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Solving for X graders with High, Average and Low Academic Stress were 0.455, 0.549 and 0.735 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Academic Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Solving for X graders with High, Average and Low Academic Stress were -0.436, -0.517 and 0.104 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Academic Stress were Leptokurtic but more so, in case of Average Academic Stress.

**Table 5.1.21** shows that mean values (M) of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were 32.45, 32.22 and 30.25 respectively. It indicated that the average of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The **Standard Deviation (SD)** of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were 11.67, 13.03 and 11.85 respectively. The results indicated that Scores on Skill of Solving for X graders with Average Educational Aspirations had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were 0.459, 0.619 and 0.628 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were -0.476, -0.246 and -0.328 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

**Table 5.1.21** shows that mean values (M) of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were 33.14, 32.28 and
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29.50 respectively. It indicated that the average of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were 13.02, 12.48 and 10.80 respectively. The results indicated that Scores on Skill of Solving for X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were 0.464, 0.564 and 0.597 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were -0.477, -0.371 and -0.341 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.

Figure 5.F.6: Mean Values of Scores on Skill of Solving for X graders in Relation to Academic Stress, Educational Aspirations and Socio-Economic Status

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Since the differences in mean values of Scores on Skill of Solving for X graders in relation to Academic Stress, Educational Aspirations and Socio-Economic Status have been observed. Hence the data were subjected to $3 \times 3 \times 3$ ANOVA on Scores of Skill of Solving for X graders.

5.1.6.2: $3 \times 3 \times 3$ ANOVA on Scores of Skill of Solving in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a $3 \times 3 \times 3$ design. The summary of $3 \times 3 \times 3$ design has been presented in the Table 5.T.22 below:

Table 5.T.22
Sum of Squares, Mean Sum of Squares and F-ratio for Scores on Skill of Solving in relation to Academic Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Main Effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Academic Stress</td>
<td>280.3</td>
<td>2</td>
<td>140.15</td>
<td>0.95</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>580.8</td>
<td>2</td>
<td>290.4</td>
<td>1.96</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>1433.6</td>
<td>2</td>
<td>716.8</td>
<td>4.85**</td>
</tr>
<tr>
<td>* Two Order Interactions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A*B</td>
<td>389.8</td>
<td>4</td>
<td>97.45</td>
<td>0.66</td>
</tr>
<tr>
<td>B*C</td>
<td>488.8</td>
<td>4</td>
<td>122.2</td>
<td>0.82</td>
</tr>
<tr>
<td>C*A</td>
<td>482.3</td>
<td>4</td>
<td>120.575</td>
<td>0.81</td>
</tr>
<tr>
<td>* Three Order Interaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A<em>B</em>C</td>
<td>1297</td>
<td>8</td>
<td>162.125</td>
<td>1.09</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>83629.5</td>
<td>567</td>
<td>147.49471</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>88582.1</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence
* Significant at 0.05 level of confidence

- **Main Effect: Academic Stress (A)**

Table 5.T.22 shows that the F-ratio for the difference in means of Scores on Skill of Solving for X graders with High, Average and Low Academic Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there
was no significant difference in means of Scores on Skill of Solving for X graders of High, Average and Low Academic Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{036}$ which stated that $X$ graders having High, Average and Low Academic Stress will not be significantly different on Scores of Skill of Solving was not rejected at the specified level. It may be concluded that $X$ graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Solving.

• **Main Effect: Educational Aspirations (B)**

Table 5.1.22 shows that the F-ratio for the difference in means of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Solving for X graders of High, Average and Low Educational Aspirations groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{037}$ which stated that $X$ graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Solving was not rejected at the specified level. It may be concluded that $X$ graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Solving.

• **Main Effect: Socio-Economic Status (C)**

Table 5.1.22 shows that the F-ratio for the difference in means of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Solving for X graders of High, Average and Low Socio-Economic Status group. The null hypothesis $H_{038}$ which stated that $X$ graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Solving was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of skill of Solving. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.1.23.
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Table 5.T.23
Means, SD’s and t-ratios for difference in scores on Skill of Solving for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>33.14</td>
<td>32.28</td>
<td>29.50</td>
</tr>
<tr>
<td>S.D.(n)</td>
<td>13.02</td>
<td>12.48</td>
<td>10.80</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>0.67</td>
<td>3.03**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>2.37*</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

Hₐ38.1: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Solving.
Hₐ38.2: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving.
Hₐ38.3: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving.

Table 5.T.23 shows that the t-ratio for the difference in means of Scores on Skill of Solving for X graders with High (C1) and Average (C2) Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis Hₐ38.1 which stated that X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Solving was not rejected at the specified level. It may be concluded that X graders having High and Average Socio-Economic Status achieved equal mean scores on Skill of Solving.

As shown in Table 5.T.23, the t-ratio for the difference in means of Scores on Skill of Solving for X graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis Hₐ38.2 which stated that X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=33.14) was higher on scores for
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Skill of Solving than their counterparts with Low Socio-Economic Status (M=29.50).

As shown in Table 5.T.23, the t-ratio for the difference in means of Scores on Skill of Solving for X graders with Average (C2) and Low (C3) Socio-Economic Status was found to be significant at the 0.05 level of confidence. This indicated that the mean scores of students with Average and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis Ho38.3 which stated that X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Average Socio-Economic Status (M=32.28) was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status (M=29.50).

- Two Order Interaction:
  Academic Stress × Educational Aspirations (A×B)

5.T.22 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Academic Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress and Educational Aspirations did not yield significantly different means on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis H039 which stated that there will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of Skill of Solving for X graders was not rejected at the specified level. It may be concluded that Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Solving for X graders.

- Two Order Interaction:
  Educational Aspirations × Socio-Economic Status (B×C)

Table 5.T.22 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors.
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factors only. The null hypothesis \( H_0 \) which stated that **there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Solving for X graders** was not rejected at the specified level. It may be concluded that **Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Solving for X graders**.

- **Two Order Interaction:**
  
  **Socio-Economic Status \( \times \) Academic Stress \( (C \times A) \)**

  Table 5.T.22 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Socio-Economic Status and Academic Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Academic Stress did not yield significantly different means on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0 \) which stated that **there will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of Skill of Solving for X graders** was not rejected at the specified level. It may be concluded that **Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Solving for X graders**.

- **Three Order Interaction:**

  **Academic Stress \( \times \) Educational Aspirations \( \times \) Socio-Economic Status \( (A \times B \times C) \)**

  Table 5.T.22 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Academic Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0 \) which stated that **there will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Solving for X graders** was not rejected at the specified level. It may be concluded that **the three variables i.e. Academic Stress, Educational Aspiration and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Solving for X graders**.
SECTION II

5.2: ANALYSIS ON MATHEMATICAL COGNITIVE SKILLS (TOTAL SCORES AND SCORES ON EACH OF THE INDIVIDUAL MATHEMATICAL COGNITIVE SKILLS) IN RELATION TO SOCIAL STRESS, EDUCATIONAL ASPIRATIONS AND SOCIO-ECONOMIC STATUS

A set of descriptive statistics and 3×3×3 ANOVA were applied on Total scores of Mathematical Cognitive Skills and separately on following Mathematical Cognitive Skills viz. Skill of Knowing, Skill of Understanding, Skill of Analysis, Skill of Applying and Skill of Solving. This set of analyses was done in relation to Social Stress (in place of Academic Stress), Educational Aspirations and Socio-Economic Status.

### 5.2.1: ANALYSIS ON TOTAL SCORES OF MATHEMATICAL COGNITIVE SKILLS

Both descriptive and inferential analyses were done on the Total scores of Mathematical Cognitive Skills.

#### 5.2.1.1: Descriptive Analysis on Mathematical Cognitive Skills (Total Scores) with Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Stress</td>
<td>High</td>
<td>198</td>
<td>44.53</td>
<td>14.61</td>
<td>0.397</td>
<td>-0.024</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>40.80</td>
<td>12.59</td>
<td>0.416</td>
<td>-0.286</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>44.81</td>
<td>14.59</td>
<td>0.496</td>
<td>-0.425</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>45.77</td>
<td>14.82</td>
<td>0.395</td>
<td>-0.459</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>44.22</td>
<td>14.08</td>
<td>0.452</td>
<td>-0.182</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>40.15</td>
<td>12.65</td>
<td>0.476</td>
<td>0.161</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>51.79</td>
<td>14.71</td>
<td>0.187</td>
<td>-0.648</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>41.03</td>
<td>11.80</td>
<td>0.366</td>
<td>-0.437</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>37.32</td>
<td>11.20</td>
<td>0.168</td>
<td>-0.743</td>
</tr>
</tbody>
</table>

*Table 5.24: Mean, Standard Deviation, Skewness and Kurtosis of Mathematical Cognitive Skills (Total Scores) with Social stress, Educational Aspirations and Socio-Economic Status*
Data Analysis And Results

Table 5.T.24 shows that mean values (M) of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Social Stress were 44.53, 40.80 and 44.81 respectively. It indicated that the average Total Scores of X graders with High, Average and Low Social Stress were not equal. The mean Scores of X graders with Low Social Stress were highest among the mean scores of X graders with High and Average Social Stress. The Standard Deviation (SD) of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Social Stress were 14.61, 12.59 and 14.59 respectively. The results indicated that Total scores of X graders with High Social Stress had yielded the most diversity. Skewness (Sk) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Social Stress were 0.397, 0.416 and 0.496 respectively, which indicated that the distribution for Total Scores of X graders with High, Average and Low Social Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Social Stress were -0.024, -0.286 and -0.425 respectively, which indicated that the distribution for Total scores of X graders with High, Average and Low Social Stress were Leptokurtic but more so, in case of Low Social Stress.

Table 5.T.24 shows that mean values (M) of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were 45.77, 44.22 and 40.15 respectively. It indicated that the average Total Scores of X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were 14.82, 14.08 and 12.65 respectively. The results indicated that Total scores of X graders with High Educational Aspirations had yielded the most diversity. Skewness (Sk) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were 0.395, 0.452 and 0.476 respectively, which indicated
that the distribution for Total Scores of X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations were -0.459, -0.182 and 0.161 respectively, which indicated that the distribution for Total scores of X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.T.24 shows that mean values (M) of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were 51.79, 41.03 and 37.32 respectively. It indicated that the average Total Scores of X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were 14.71, 11.80 and 11.20 respectively. The results indicated that Total scores of X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were 0.187, 0.366 and 0.168 respectively, which indicated that the distribution for Total Scores of X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Total scores on Mathematical Cognitive Skills for X graders with High, Average and Low Socio-Economic Status were -0.648, -0.437 and -0.743 respectively, which indicated that the distribution for Total scores of X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of Low Socio-Economic Status.
Data Analysis And Results

Since the differences in mean values of Mathematical Cognitive Skills (Total scores) for X graders in relation to Social Stress, Educational Aspirations and Socio-Economic Status have been observed. Hence the data were subjected to $3\times3\times3$ ANOVA on Total scores of Mathematical Cognitive Skills for X graders.

5.2.1.2: $3\times3\times3$ ANOVA on Mathematical Cognitive Skills (Total Scores) in relation to Social Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a $3\times3\times3$ design. The summary of $3\times3\times3$ design has been presented in the Table 5.T.25 below:
Table 5.T.25

Sum of Squares, Mean Sum of Squares and F-ratio for Total Scores on Mathematical Cognitive Skills in relation to Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Main Effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Social Stress</td>
<td>1980.7</td>
<td>2</td>
<td>990.35</td>
<td>7.05**</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>3333</td>
<td>2</td>
<td>1666.5</td>
<td>11.87**</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>22375.2</td>
<td>2</td>
<td>11187.6</td>
<td>79.69**</td>
</tr>
<tr>
<td>• Two Order Interactions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A*B</td>
<td>2094.3</td>
<td>4</td>
<td>429.825</td>
<td>3.72**</td>
</tr>
<tr>
<td>B*C</td>
<td>1741.3</td>
<td>4</td>
<td>523.575</td>
<td>3.10*</td>
</tr>
<tr>
<td>C*A</td>
<td>1719.3</td>
<td>4</td>
<td>1666.5</td>
<td>3.06*</td>
</tr>
<tr>
<td>• Three Order Interaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A<em>B</em>C</td>
<td>1807.2</td>
<td>8</td>
<td>435.325</td>
<td>1.60</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>79597.6</td>
<td>567</td>
<td>225.9</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>114648.7</td>
<td>593</td>
<td>140.38377</td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

• Main Effect: Social Stress (A)

Table 5.T.25 shows that the F-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Social Stress, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in the mean of Total Scores on Mathematical Cognitive Skills for X graders of High, Average and Low Social Stress group. The null hypothesis $H_0:3$ which stated that $X$ graders having High, Average and Low Social Stress will not be significantly different on Total scores of Mathematical Cognitive Skills was rejected at the specified level. It may be inferred that the three groups of X graders were different on their Total Scores of Mathematical Cognitive Skills. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.26.
Data Analysis And Results

Table 5.T.26
Means, SD's and t-ratios for difference in Total Scores on Mathematical Cognitive Skills for High, Average and Low Levels of Social Stress

<table>
<thead>
<tr>
<th>Social Stress (A)</th>
<th>High Level (A1)</th>
<th>Average Level (A2)</th>
<th>Low Level (A3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>44.53</td>
<td>40.80</td>
<td>44.81</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td>14.61</td>
<td>12.59</td>
<td>14.59</td>
</tr>
<tr>
<td>High Level (A1)</td>
<td>-</td>
<td>2.72**</td>
<td>0.19</td>
</tr>
<tr>
<td>Average Level (A2)</td>
<td>-</td>
<td>-</td>
<td>2.94**</td>
</tr>
<tr>
<td>Low Level (A3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

H₀43.1: X graders having High (A1) and Average (A2) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.
H₀43.2: X graders having High (A1) and Low (A3) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.
H₀43.3: X graders having Average (A2) and Low (A3) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.

In Table 5.T.26, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High (A1) and Average (A2) Social Stress was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Average Social Stress differed beyond the contribution of chance factors. The null hypothesis H₀43.1 which stated that X graders having High (A1) and Average (A2) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Social Stress (M=44.53) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Social Stress (M=40.80).

Table 5.T.26 shows that the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High (A1) and Low (A3) Social Stress, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀43.2 which stated that X graders having High (A1) and Low (A3) Social Stress...
Data Analysis And Results

will not be significantly different on Total Scores of Mathematical Cognitive Skills was not rejected at the specified level. It may be concluded that X graders having High and Low Social Stress achieved equal means of Total Scores on Mathematical Cognitive Skills.

In Table 5.1.26, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with Average (A2) and Low (A3) Social Stress was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Social Stress differed beyond the contribution of chance factors. The null hypothesis $H_{043.3}$ which stated that X graders having Average (A2) and Low (A3) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Low Social Stress ($M=44.81$) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Social Stress ($M=40.80$).

- **Main Effect: Educational Aspirations (B)**

Table 5.1.25 shows that the F-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Total Scores on Mathematical Cognitive Skills for X graders of High, Average and Low Educational Aspirations groups. The null hypothesis $H_{044}$ which stated that X graders having High, Average and Low Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills was rejected at the specified level. It may be inferred that the three groups of X graders were different on their Total Scores of Mathematical Cognitive Skills. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.1.27.
Data Analysis And Results

Table 5.T.27
Means, SD’s and t-ratios for difference in Total Scores on Mathematical Cognitive Skills for High, Average and Low Levels of Educational Aspirations

<table>
<thead>
<tr>
<th>Educational Aspirations (B)</th>
<th>High Level (B1)</th>
<th>Average Level (B2)</th>
<th>Low Level (B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>45.77</td>
<td>44.22</td>
<td>40.15</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>14.82</td>
<td>14.08</td>
<td>12.65</td>
</tr>
<tr>
<td>High Level (B1)</td>
<td>-</td>
<td>1.06</td>
<td>4.07**</td>
</tr>
<tr>
<td>Average Level (B2)</td>
<td>-</td>
<td>-</td>
<td>3.03**</td>
</tr>
<tr>
<td>Low Level (B3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

H₀44.1: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀44.2: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀44.3: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

Table 5.T.27 shows that the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High (B1) and Average (B2) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀44.1 which stated that X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills was not rejected at the specified level. It may be concluded that X graders having High and Average Educational Aspirations achieved equal means of Total Scores on Mathematical Cognitive Skills.

As shown in Table 5.T.27, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis...
Data Analysis And Results

H_{044.2} which stated that \textit{X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills} was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of \textit{X graders with High Educational Aspirations (M=45.77)} was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations (M=40.15).

In Table 5.T.27, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for \textit{X graders with Average (B2) and Low (B3) Educational Aspirations} was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis H_{044.3} which stated that \textit{X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills} was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of \textit{X graders with Average Educational Aspirations (M=44.22)} was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations (M=40.15).

- **Main Effect: Socio-Economic Status (C)**

Table 5.T.25 shows that the F-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for \textit{X graders with High, Average and Low Socio-Economic Status}, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Total Scores on Mathematical Cognitive Skills for \textit{X graders of High, Average and Low Socio-Economic Status} groups. The null hypothesis H_{045} which stated that \textit{X graders having High, Average and Low Socio-Economic Status will not be significantly different on Total scores of Mathematical Cognitive Skills} was rejected at the specified level. It may be inferred that the three groups of \textit{X graders were different on their Total Scores of Mathematical Cognitive Skills}. To ascertain which group of \textit{X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.28.
Data Analysis And Results

Table 5.T.28
Means, SD's and t-ratios for difference in Total Scores of Mathematical Cognitive Skills for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>51.79</td>
<td>41.03</td>
<td>37.32</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>14.71</td>
<td>11.80</td>
<td>11.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>8.02**</td>
<td>11.04**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>3.22**</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
* Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

H₀45.1: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀45.2: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀45.3: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

In Table 5.T.28, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High (C1) and Average (C2) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis H₀45.1 which stated that X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=51.79) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Socio-Economic Status (M=41.03).

As shown in Table 5.T.28, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence.
This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_045.2$ which stated that "X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills" was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status ($M=51.79$) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status ($M=37.32$).

In Table 5.T.28, the t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders with Average (C2) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_045.3$ which stated that "X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills" was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Average Socio-Economic Status ($M=41.03$) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status ($M=37.32$).

- Two Order Interaction:

**Social Stress × Educational Aspirations (A×B)**

Table 5.T.25 shows that the F-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Social Stress and Educational Aspirations was found to be significant at the 0.01 level of confidence. It suggested that the interaction effect of Social Stress and Educational Aspirations yielded significantly different means of Total Scores on Mathematical Cognitive Skills for X graders. The null hypothesis $H_046$ which stated that "there will be no significant interaction effect of Social Stress and Educational Aspirations on Total scores of Mathematical Cognitive Skills for X graders" was rejected at the specified level. It may be inferred that the various combination groups of X graders (A1-A2, A1-A3, A1-B1, A1-B2, A1-B3, A2-A3, A2-B1, A2-B2, A2-B3, A3-B1, A3-B2, A3-B3, B1-B2, B1-B3 and B2-B3) were different on their Total Scores of
Data Analysis And Results

Mathematical Cognitive Skills beyond chance. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following table.

Table 5.1.29
Means, SD’s and t-ratios for difference in means of various combination groups due to interaction of Social Stress and Educational Aspirations

<table>
<thead>
<tr>
<th>Groups</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>44.53</td>
<td>40.80</td>
<td>44.81</td>
<td>45.77</td>
<td>44.22</td>
<td>40.15</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>14.61</td>
<td>12.59</td>
<td>14.59</td>
<td>14.82</td>
<td>14.08</td>
<td>12.65</td>
</tr>
<tr>
<td>A1</td>
<td>-</td>
<td>2.72**</td>
<td>0.19</td>
<td>0.84</td>
<td>0.21</td>
<td>3.19**</td>
</tr>
<tr>
<td>A2</td>
<td>-</td>
<td>-</td>
<td>2.94**</td>
<td>3.60**</td>
<td>2.55*</td>
<td>0.51</td>
</tr>
<tr>
<td>A3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.65</td>
<td>0.40</td>
<td>3.40**</td>
</tr>
<tr>
<td>B1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.06</td>
<td>4.07**</td>
</tr>
<tr>
<td>B2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.03**</td>
</tr>
<tr>
<td>B3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

Hₜ46.1:X graders having High (A1) and Average (A2) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.2:X graders having High (A1) and Low (A3) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.3:X graders having High Social Stress (A1) and High Educational Aspirations (B1) will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.4:X graders having High Social Stress (A1) and Average Educational Aspirations (B2) will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.5:X graders having High Social Stress (A1) and Low Educational Aspirations (B3) will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.6:X graders having Average (A2) and Low (A3) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.7:X graders having Average Social Stress (A2) and High Educational Aspirations (B1) will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.8:X graders having Average Social Stress (A2) and Average Educational Aspirations (B2) will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Hₜ46.9:X graders having Average Social Stress (A2) and Low Educational Aspirations (B3) will not be significantly different on Total Scores of Mathematical Cognitive Skills.
H046.10: X graders having Low Social Stress (A3) and High Educational Aspirations (B1) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H046.11: X graders having Low Social Stress (A3) and Average Educational Aspirations (B2) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H046.12: X graders having Low Social Stress (A3) and Low Educational Aspirations (B3) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H046.13: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H046.14: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H046.15: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

As shown in Table 5.T.29, the t-ratios for the difference in means of Total scores on Mathematical Cognitive Skills for X graders were found to be significant at the 0.01 level of confidence for the following combination groups viz:


Similarly, t-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for the group A2-B2 was found to be significant at the 0.05 level of confidence. This indicated that all these groups were different in their mean scores beyond any chance factors. Therefore the corresponding hypotheses H046.1, H046.5, H046.6, H046.7, H046.8, H046.12, H046.14 and H046.15 were rejected at the specified levels. An examination of means of the two groups in each of the above mentioned combination groups led to the following conclusions:

- High Social Stress Group (A1) was higher on means of Total scores on Cognitive Skills in Mathematics (M=44.53) as compared to their counterparts Group (A2) of Average Social Stress group (M=40.80). Therefore, H0 46.1 was rejected.

- High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.53) than their counterparts in Low Educational Aspirations Group (B3) (M=40.15). Therefore, H046.5 was rejected.
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- Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=44.81$) than their counterparts in Average Social Stress Group (A2) ($M=40.80$). Therefore, $H_046.6$ was rejected.

- High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=45.77$) than their counterparts in Average Social Stress Group (A2) ($M=40.80$). Therefore, $H_046.7$ was rejected.

- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=44.22$) than their counterparts in Average Social Stress Group (A2) ($M=40.80$). Therefore, $H_046.8$ was rejected.

- Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=44.81$) than their counterparts in Low Educational Aspirations Group (B3) ($M=40.15$). Therefore, $H_046.12$ was rejected.

- High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=45.77$) than their counterparts in Low Educational Aspirations Group (B3) ($M=40.15$). Therefore, $H_046.14$ was rejected.

- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=44.22$) than their counterparts in Low Educational Aspirations Group (B3) ($M=40.15$). Therefore, $H_046.15$ was rejected.

However, t-ratios for the difference in means of Total scores on Mathematical Cognitive Skills for X graders in the following combination groups were not found to be significant even at the 0.05 level of confidence. These groups were:


The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses $H_046.2$, $H_046.3$, $H_046.4$, $H_046.9$, $H_046.10$, $H_046.11$ and $H_046.13$ were not rejected at the specified level. An examination of means on Mathematical Cognitive Skills of each of these combination groups led to the following conclusions:
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- Mean of Total scores on Mathematical Cognitive Skills for X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different. Therefore, $H_046.2$ was not rejected.
- High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_046.3$ was not rejected.
- High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_046.4$ was not rejected.
- Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_046.9$ was not rejected.
- Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_046.10$ was not rejected.
- Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_046.11$ was not rejected.
- X graders having High (B1) and Average (B2) Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_046.13$ was not rejected.

- **Two Order Interaction:**

**Educational Aspirations $\times$ Socio-Economic Status (B$\times$C)**

Table 5.T.25 shows that the F-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was found to be significant at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status yielded significantly different means on Total Scores of Mathematical Cognitive Skills of X graders. The null hypothesis $H_047$ which stated that *there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on Total scores of Mathematical Cognitive Skills for X graders* was rejected at the specified level. It may be inferred that the
Data Analysis And Results

various combination groups of X graders (B1-B2, B1-B3, B1-C1, B1-C2, B1-C3, B2-B3, B2-C1, B2-C2, B2-C3, B3-C1, B3-C2, B3-C3, C1-C2, C1-C3 and C2-C3) were different beyond chance factors on their Total Scores of Mathematical Cognitive Skills. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.30.

Table 5.T.30
Means, SD’s and t-ratios for difference in means of various combination groups due to interaction of Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Groups</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>14.82</td>
<td>14.08</td>
<td>12.65</td>
<td>14.71</td>
<td>11.80</td>
<td>11.20</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>-</td>
<td>1.06</td>
<td>4.07**</td>
<td>4.06**</td>
<td>3.53**</td>
<td>6.40**</td>
</tr>
<tr>
<td>B2</td>
<td>-</td>
<td>-</td>
<td>3.03**</td>
<td>5.25**</td>
<td>2.45*</td>
<td>5.43**</td>
</tr>
<tr>
<td>B3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8.49**</td>
<td>0.72</td>
<td>2.35*</td>
</tr>
<tr>
<td>C1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8.02**</td>
<td>11.04**</td>
</tr>
<tr>
<td>C2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.22**</td>
</tr>
<tr>
<td>C3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence
*Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

H047.1:X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H047.2:X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H047.3:X graders having High Educational Aspirations (B1) and High Socio-Economic Status (C1) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H047.4:X graders having High Educational Aspirations (B1) and Average Socio-Economic Status (C2) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H047.5:X graders having High Educational Aspirations (B1) and Low Socio-Economic Status (C3) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H047.6:X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Total Scores of Mathematical Cognitive Skills.
Data Analysis And Results

\(H_047.7\): X graders having Average Educational Aspirations (B2) and High Socio-Economic Status (C1) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.8\): X graders having Average Educational Aspirations (B2) and Average Socio-Economic Status (C2) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.9\): X graders having Average Educational Aspirations (B2) and Low Socio-Economic Status (C3) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.10\): X graders having Low Educational Aspirations (B3) and High Socio-Economic Status (C1) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.11\): X graders having Low Educational Aspirations (B3) and Average Socio-Economic Status (C2) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.12\): X graders having Low Educational Aspirations (B3) and Low Socio-Economic Status (C3) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.13\): X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.14\): X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

\(H_047.15\): X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

As shown in Table 5.T.30, the t-ratios for the difference in means of Total scores on Mathematical Cognitive Skills for X graders were found to be significant at the 0.01 level of confidence for the following combination groups viz:

- B1-B3, B1-C1, B1-C2, B1-C3, B2-B3, B2-C1, B2-C3, B3-C1, C1-C2, C1-C3 and C2-C3

Similarly, t-ratios for the difference in means of Total Scores on Mathematical Cognitive Skills for the groups B2-C2 and B3-C3 were found to be significant at the 0.05 level of confidence. This indicated that all these groups were different in their mean scores beyond any chance factors. Therefore the corresponding hypotheses \(H_047.2\), \(H_047.3\), \(H_047.4\), \(H_047.5\), \(H_047.6\), \(H_047.7\), \(H_047.8\), \(H_047.9\), \(H_047.10\), \(H_047.12\), \(H_047.13\), \(H_047.14\) and \(H_047.15\) were rejected at the specified levels. An examination of means of the two groups in each of the above mentioned combination groups led to the following conclusions:
Data Analysis And Results

- High Educational Aspirations Group (B1) was higher on means of Total scores on Cognitive Skills in Mathematics (M=45.77) as compared to their counterparts (Group B3) of Low Educational Aspirations group (M=40.15). Therefore, H047.2 was rejected.

- High Socio-Economic Status Group (C1) performed higher on means of Total scores on Mathematical Cognitive Skills (M=51.79) as compared to High Educational Aspirations Group (B1) (M=45.77). Therefore, H047.3 was rejected.

- High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=45.77) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, H047.4 was rejected.

- High Educational Aspirations Group (B1) achieved higher means on Total scores of Cognitive Skills in Mathematics (M=45.77) as compared to their counterparts in Group of X graders with Low Socio-Economic Status (C3) (M=37.32). Therefore, H047.5 was rejected.

- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.22) than their counterparts in Low Educational Aspirations Group (B3) (M=40.15). Therefore, H047.6 was rejected.

- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=51.79) than their counterparts in Average Educational Aspirations (B2) (M=44.22). Therefore, H047.7 was rejected.

- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.22) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, H047.8 was rejected.

- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.22) than their counterparts in Low Socio-Economic Status Group (C3) (M=37.32). Therefore, H047.9 was rejected.
• High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=51.79) than their counterparts in Low Educational Aspirations Group (B3) (M=40.15). Therefore, Ho47.10 was rejected.

• Low Educational Aspirations Group (B3) achieved higher means on Total scores of Mathematical Cognitive Skills (M=40.15) than their counterparts in Low Socio-Economic Status Group (C3) (M=37.32). Therefore, Ho47.12 was rejected.

• High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=51.79) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, Ho47.13 was rejected.

• Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=41.03) than their counterparts in Low Socio-Economic Status Group (C3) (M=37.32). Therefore, Ho47.15 was rejected.

However, t-ratios for the difference in means of Total scores on Mathematical Cognitive Skills for X graders in the following combination groups were not found to be significant even at the 0.05 level of confidence. These groups were:

- B1-B2 and B3-C2

The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses Ho47.1 and Ho47.11 were not rejected at the specified level. An examination of means on Mathematical Cognitive Skills of each of these combination groups led to the following conclusions:

• Mean of Total scores on Mathematical Cognitive Skills for X graders with High Educational Aspirations (B1) and that of those in Average Educational Aspirations (B2) were not different. Therefore, Ho47.1 was not rejected.
Low Educational Aspirations group (B3) of X graders and that of Average Socio-Economic Status (C2) achieved equal on Mathematical Cognitive Skills. Therefore, \( H_4 \) was not rejected.

Two Order Interaction:

Socio-Economic Status \( \times \) Social Stress (C\( \times \)A)

Table 5.1.25 shows that the F-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Socio-Economic Status and Social Stress was found to be significant at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Social Stress yielded significantly different means of Total Scores on Mathematical Cognitive Skills for X graders. The null hypothesis \( H_4 \) which stated that there will be no significant interaction effect of Socio-Economic Status and Social Stress on Total scores of Mathematical Cognitive Skills for X graders was rejected at the specified level. It may be inferred that the various combination groups of X graders (C1-C2, C1-C3, C1-A1, C1-A2, C1-A3, C2-C3, C2-A1, C2-A2, C2-A3, C3-A1, C3-A2, C3-A3, A1-A2, A1-A3 and A2-A3) were different on their Total Scores of Mathematical Cognitive Skills beyond chance. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following table.

Table 5.1.31

<table>
<thead>
<tr>
<th>Groups</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>51.79</td>
<td>41.03</td>
<td>37.32</td>
<td>44.53</td>
<td>40.80</td>
<td>44.81</td>
</tr>
<tr>
<td>C1</td>
<td>-</td>
<td>8.02**</td>
<td>11.04**</td>
<td>4.93**</td>
<td>8.02**</td>
<td>4.74**</td>
</tr>
<tr>
<td>C2</td>
<td>-</td>
<td>-</td>
<td>3.22**</td>
<td>2.63**</td>
<td>0.18</td>
<td>2.84**</td>
</tr>
<tr>
<td>C3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5.54**</td>
<td>2.92**</td>
<td>5.76**</td>
</tr>
<tr>
<td>A1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.72**</td>
<td>0.19</td>
</tr>
<tr>
<td>A2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.94**</td>
</tr>
<tr>
<td>A3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence
*Significant at 0.05 level of confidence
Following sub-hypotheses were tested through these t-ratios:

H₀48.1: X graders having High (C₁) and Average (C₂) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.2: X graders having High (C₁) and Low (C₃) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.3: X graders having High Socio-Economic Status (C₁) and High Social Stress (A₁) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.4: X graders having High Socio-Economic Status (C₁) and Average Social Stress (A₂) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.5: X graders having High Socio-Economic Status (C₁) and Low Social Stress (A₃) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.6: X graders having Average Socio-Economic Status (C₂) and Low (C₃) Socio-Economic Status will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.7: X graders having Average Socio-Economic Status (C₂) and High Social Stress (A₁) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.8: X graders having Average Socio-Economic Status (C₂) and Average Social Stress (A₂) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.9: X graders having Average Socio-Economic Status (C₂) and Low Social Stress (A₃) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.10: X graders having Low Socio-Economic Status (C₃) and High Social Stress (A₁) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.11: X graders having Low Socio-Economic Status (C₃) and Average Social Stress (A₂) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.12: X graders having Low Socio-Economic Status (C₃) and Low Social Stress (A₃) will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.13: X graders having High (A₁) and Average (A₂) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.14: X graders having High (A₁) and Low (A₃) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.

H₀48.15: X graders having Average (A₂) and Low (A₃) Social Stress will not be significantly different on Total Scores of Mathematical Cognitive Skills.

As shown in Table 5.T.31, the t-ratios for the difference in the means of Total scores of Mathematical Cognitive Skills of X graders were found to be significant at the 0.01 level of confidence for the following combination groups viz:
Data Analysis And Results


This indicated that all these groups were different in their mean scores beyond any chance factors. Therefore the corresponding hypotheses $H_048.1$, $H_048.2$, $H_048.3$, $H_048.4$, $H_048.5$, $H_048.6$, $H_048.7$, $H_048.9$, $H_048.10$, $H_048.11$, $H_048.12$, $H_048.13$ and $H_048.15$ were rejected at the specified levels. An examination of means of the two groups in each of the above mentioned combination groups led to the following conclusions:

- High Socio-Economic Status Group (C1) was higher on means of Total scores on Cognitive Skills in Mathematics ($M=51.79$) as compared to their counterparts Group (C2) of Average Socio-Economic Status group ($M=41.03$). Therefore, $H_048.1$ was rejected.
- High Socio-Economic Status Group (C1) performed higher on means of Total scores on Mathematical Cognitive Skills ($M=51.79$) as compared to Low Socio-Economic Status Group (C3) ($M=37.32$). Therefore, $H_048.2$ was rejected.
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=51.79$) than their counterparts in High Social Stress Group (A1) ($M=44.53$). Therefore, $H_048.3$ was rejected.
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Cognitive Skills in Mathematics ($M=51.79$) as compared to their counterparts in Group of X graders with Average Social Stress (A2) ($M=40.80$). Therefore, $H_048.4$ was rejected.
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=51.79$) than their counterparts in Low Social Stress Group (A3) ($M=44.81$). Therefore, $H_048.5$ was rejected.
- Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=41.03$) than their counterparts in Low Socio-Economic Status Group (C3) ($M=37.32$). Therefore, $H_048.6$ was rejected.
- High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills ($M=44.53$) than their counterparts in Average Socio-Economic Status Group (C2) ($M=41.03$). Therefore, $H_048.7$ was rejected.
Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.81) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, H048.9 was rejected.

High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.53) than their counterparts in Low Socio-Economic Status Group (C3) (M=37.32). Therefore, H048.10 was rejected.

Average Social Stress Group (A2) achieved higher means on Total scores of Mathematical Cognitive Skills (M=40.80) than their counterparts in Low Socio-Economic Status Group (C3) (M=37.32). Therefore, H048.11 was rejected.

Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.81) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, H048.9 was rejected.

Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.81) than their counterparts in Average Socio-Economic Status Group (C2) (M=41.03). Therefore, H048.9 was rejected.

High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.53) than their counterparts in Average Socio-Economic Status Group (A2) (M=40.80). Therefore, H048.13 was rejected.

Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills (M=44.81) than their counterparts in Average Socio-Economic Status Group (A2) (M=40.80). Therefore, H048.15 was rejected.

However, t-ratios for the difference in means of Total scores on Mathematical Cognitive Skills for X graders in the following combination groups were not found to be significant even at the 0.05 level of confidence. These groups were:

- C2-A2 and A1-A3

The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses $H_0$48.8 and $H_0$48.14 were not rejected at the specified level. An examination of means on Mathematical Cognitive Skills of each of these combination groups led to the following conclusions:

- Average Socio-Economic Status group (C2) of X graders and that of Average Social Stress (A2) achieved equal means of Total scores on Mathematical Cognitive Skills. Therefore, $H_0$48.8 was not rejected.

- X graders having High (A1) and Low (A3) Social Stress achieved equal means on Total scores of Mathematical Cognitive Skills. Therefore, $H_0$48.14 was not rejected.
Data Analysis And Results

• Three Order Interaction:
  Social Stress × Educational Aspirations × Socio-Economic Status
  \((A\times B\times C)\)

Table 5.T.25 shows that the F-ratio for the difference in means of Total Scores on Mathematical Cognitive Skills for X graders due to the interaction between Social Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means on Total Scores of Mathematical Cognitive Skills for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis \(H_0\) which stated that there will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on Total scores of Mathematical Cognitive Skills for X graders was not rejected at the specified level. It may be concluded that the three variables Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different means of Total Scores on Mathematical Cognitive Skills for X graders.

### 5.2.2: ANALYSIS ON SCORES FOR SKILL OF KNOWING

A similar set of analysis was applied on individual scores for Skill of Knowing.

5.2.2.1: Descriptive Analysis of Scores on Skill of Knowing with Social Stress, Educational Aspirations and Socio-Economic Status

Table 5.T.32

Mean, Standard Deviation, Skewness and Kurtosis on Scores of Skill of Knowing with Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Stress</td>
<td>High</td>
<td>198</td>
<td>41.18</td>
<td>14.42</td>
<td>0.552</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>37.97</td>
<td>12.65</td>
<td>0.527</td>
<td>-0.408</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>42.03</td>
<td>14.89</td>
<td>0.580</td>
<td>-0.395</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>43.00</td>
<td>14.76</td>
<td>0.406</td>
<td>-0.485</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>40.69</td>
<td>14.16</td>
<td>0.659</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>37.49</td>
<td>12.85</td>
<td>0.673</td>
<td>0.119</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>45.65</td>
<td>15.65</td>
<td>0.461</td>
<td>-0.589</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>39.59</td>
<td>12.68</td>
<td>0.478</td>
<td>-0.545</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>35.94</td>
<td>12.02</td>
<td>0.393</td>
<td>-0.580</td>
</tr>
</tbody>
</table>
Data Analysis And Results

Table 5.3.2 shows that mean values (M) of Scores on Skill of Knowing for X graders with High, Average and Low Social Stress were 41.18, 37.97 and 42.03 respectively. It indicated that the average of Scores on Skill of Knowing for X graders with High, Average and Low Social Stress were not equal. The mean Scores of X graders with Low Social Stress were highest among the mean scores of X graders with High and Average Social Stress. The Standard Deviation (SD) of Scores on Skill of Knowing for X graders with High, Average and Low Social Stress were 14.42, 12.65 and 14.89 respectively. The results indicated that Scores on Skill of Knowing for X graders with Low Social Stress had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Knowing for X graders with High, Average and Low Social Stress were 0.552, 0.527 and 0.580 respectively, which indicated that the distribution for Scores on Skill of Knowing for X graders with High, Average and Low Social Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Knowing for X graders with High, Average and Low Social Stress were 0.007, -0.408 and -0.395 respectively, which indicated that the distribution for Scores on Skill of Knowing for X graders with High, Average and Low Social Stress were Leptokurtic but more so, in case of Average Social Stress.

Table 5.3.2 shows that mean values (M) of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were 43.00, 40.69 and 37.49 respectively. It indicated that the average of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were 14.76, 14.16 and 12.85 respectively. The results indicated that Scores on Skill of Knowing for X graders with High Educational Aspirations had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Knowing for X graders with High, Average and Low Educational
Aspirations were 0.406, 0.659 and 0.673 respectively, which indicated that the distribution of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were -0.485, 0.003 and 0.119 respectively, which indicated that the distribution of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.T.32 shows that mean values (M) of Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were 45.65, 39.59 and 35.94 respectively. It indicated that the average of Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were 15.65, 12.68 and 12.02 respectively. The results indicated that Scores on Skill of Knowing for X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were 0.461, 0.478 and 0.393 respectively, which indicated that the distribution for Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were -0.589, -0.545 and -0.580 respectively, which indicated that the distribution of Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.
Data Analysis And Results

Since the differences in mean values of Scores on Skill of Knowing for X graders in relation to Social Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to 3x3x3 ANOVA on Scores of Skill of Knowing for X graders.

5.2.2.2: 3x3x3 ANOVA on Scores of Skill of Knowing in relation to Social Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F- ratios were computed for main effects and interaction effects of various independent variables employing a 3x3x3 design. The summary of 3x3x3 design has been presented in the Table 5.T.33 below:
Data Analysis And Results

Table 5.T.33

Sum of Squares, Mean Sum of Squares and F-ratio on Scores of Skill of Knowing for X graders in relation to Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Social Stress</td>
<td>1807.1</td>
<td>2</td>
<td>903.55</td>
<td>5.35**</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>3026.9</td>
<td>2</td>
<td>1513.45</td>
<td>8.97**</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>9531.4</td>
<td>2</td>
<td>4765.7</td>
<td>28.25**</td>
</tr>
<tr>
<td><strong>Two Order Interactions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxB</td>
<td>3049.5</td>
<td>4</td>
<td>762.375</td>
<td>4.52**</td>
</tr>
<tr>
<td>BxC</td>
<td>1181.1</td>
<td>4</td>
<td>295.275</td>
<td>1.75</td>
</tr>
<tr>
<td>CxA</td>
<td>892.2</td>
<td>4</td>
<td>223.05</td>
<td>1.32</td>
</tr>
<tr>
<td><strong>Three Order Interaction:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxBxC</td>
<td>2135.2</td>
<td>8</td>
<td>266.9</td>
<td>1.58</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>95622.9</td>
<td>567</td>
<td>168.64709</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>117246.3</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

- **Main Effect : Social Stress (A)**

Table 5.T.33 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders with High, Average and Low Social Stress, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of scores on Skill of Knowing for X graders of High, Average and Low Social Stress groups. The null hypothesis $H_0$ which stated that *X graders having High, Average and Low Social Stress will not be significantly different on scores of Skill of Knowing* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of Skill of Knowing. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.34.
Table 5.T.34
Means, SD’s and t-ratios for difference in Skill of Knowing for High, Average and Low Levels of Social Stress

<table>
<thead>
<tr>
<th>Social Stress (A)</th>
<th>High Level (A1)</th>
<th>Average Level (A2)</th>
<th>Low Level (A3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>41.18</td>
<td>37.97</td>
<td>42.03</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>14.42</td>
<td>12.65</td>
<td>14.89</td>
</tr>
<tr>
<td>High Level (A1)</td>
<td>-</td>
<td>2.36*</td>
<td>0.57</td>
</tr>
<tr>
<td>Average Level (A2)</td>
<td>-</td>
<td>-</td>
<td>2.94**</td>
</tr>
<tr>
<td>Low Level (A3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

H0.1: X graders having High (A1) and Average (A2) Social Stress will not be significantly different on scores of Skill of Knowing.

H0.2: X graders having High (A1) and Low (A3) Social Stress will not be significantly different on scores of Skill of Knowing.

H0.3: X graders having Average (A2) and Low (A3) Social Stress will not be significantly different on scores of Skill of Knowing.

In Table 5.T.34, the t-ratio for the difference in means of scores on Skill of Knowing for X graders with High (A1) and Average (A2) Social Stress was found to be significant at the 0.05 level of confidence. This indicated that the mean scores of students with High and Average Social Stress differed beyond the contribution of chance factors. The null hypothesis H0.1 which stated that X graders having High (A1) and Average (A2) Social Stress will not be significantly different on scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Social Stress (M=41.18) was higher on scores of Skill of Knowing than their counterparts with Average Social Stress (M=37.97).

Table 5.T.34 shows that the t-ratio for the difference in means of scores on Skill of Knowing for X graders with High (A1) and Low (A3) Social Stress, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis H0.2 which stated that X graders having High (A1) and Low (A3) Social Stress will not be significantly different on scores of Skill of Knowing was not rejected at the specified level. It may be concluded that X graders having High and Low Social Stress achieved equal mean scores on Skill of Knowing.
Data Analysis And Results

In Table 5.T.34, the t-ratio for the difference in means of scores on Skill of Knowing for X graders with Average (A2) and Low (A3) Social Stress was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Social Stress differed beyond the contribution of chance factors. The null hypothesis $H_0$ which stated that $X$ graders having Average (A2) and Low (A3) Social Stress will not be significantly different on scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Low Social Stress ($M=42.03$) was higher on scores of Skill of Knowing than their counterparts with Average Social Stress ($M=37.97$).

- **Main Effect: Educational Aspirations (B)**

  Table 5.T.33 shows that the F-ratio for the difference in means of Scores on Skill of Knowing for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference between the mean of Scores on Skill of Knowing for X graders of High, Average and Low Educational Aspirations groups. The null hypothesis $H_0$ which stated that $X$ graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Knowing was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of Skill of Knowing. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.35.

<table>
<thead>
<tr>
<th>Educational Aspirations (B)</th>
<th>High Level (B1)</th>
<th>Average Level (B2)</th>
<th>Low Level (B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>43.00</td>
<td>40.69</td>
<td>37.49</td>
</tr>
<tr>
<td>S.D. (σ)</td>
<td>14.76</td>
<td>14.16</td>
<td>12.85</td>
</tr>
<tr>
<td>High Level (B1)</td>
<td>-</td>
<td>1.59</td>
<td>3.96**</td>
</tr>
<tr>
<td>Average Level (B2)</td>
<td>-</td>
<td>-</td>
<td>2.37**</td>
</tr>
<tr>
<td>Low Level (B3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
* Significant at 0.05 level of confidence
Following sub-hypotheses were tested through these t-ratios:

\(^{H_051.1:}\) X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

\(^{H_051.2:}\) X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

\(^{H_051.3:}\) X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

Table 5.T.35 shows that the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with High (B1) and Average (B2) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis \(^{H_051.1:}\) which stated that \(X\) graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Knowing was not rejected at the specified level. It may be concluded that X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Knowing.

As shown in Table 5.T.35, the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis \(^{H_051.2:}\) which stated that \(X\) graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Educational Aspirations (M=43.00) was higher on scores of Skill of Knowing than their counterparts with Low Educational Aspirations (M=37.49).

In Table 5.T.35, the t-ratio for the difference in Scores on Skill of Knowing for X graders with Average (B2) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis \(^{H_051.3:}\) which stated that \(X\) graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing was therefore rejected at the
Data Analysis And Results

specified level. A probe into means led to conclude that the mean achievement of X graders with Average Educational Aspirations (M=40.69) was higher on scores of Skill of Knowing than their counterparts with Low Educational Aspirations (M=37.49).

- **Main Effect : Socio-Economic Status (C)**

  Table 5.T.33 shows that the F-ratio for the difference in means of Scores on Skill of Knowing for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Knowing for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis $H_0$ which stated that *X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Knowing* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of skill of Knowing. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.36

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>45.65</td>
<td>39.59</td>
<td>35.94</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td>15.65</td>
<td>12.68</td>
<td>12.02</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>4.23**</td>
<td>6.93**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>2.94**</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
*Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

- **H$_{52.1}$**: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing.
- **H$_{52.2}$**: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing.
- **H$_{52.3}$**: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing.
In Table 5.T.36, the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with High (C1) and Average (C2) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_0^{52.1}$ which stated that X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status ($M=45.65$) was higher on scores for Skill of Knowing than their counterparts with Average Socio-Economic Status ($M=39.59$).

As shown in Table 5.T.36, the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_0^{52.2}$ which stated that X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status ($M=45.65$) was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status ($M=35.94$).

In Table 5.T.36, the t-ratio for the difference in means of Scores on Skill of Knowing for X graders with Average (C2) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_0^{52.3}$ which stated that X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Knowing was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Average Socio-Economic Status ($M=39.59$) was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status ($M=35.94$).
Data Analysis And Results

- Two Order Interaction:

Social Stress $\times$ Educational Aspirations (A$\times$B)

Table 5.T.33 shows that the F-ratio for the difference in means of Scores on Skill of Knowing for X graders due to the interaction between Social Stress and Educational Aspirations was found to be significant at the 0.01 level of confidence. It suggested that the interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Scores of Skill of Knowing for X graders. The null hypothesis $H_{053}$ which stated that there will be no significant interaction effect of Social Stress and Educational Aspirations on scores of Skill of Knowing for X graders was rejected at the specified level. It may be inferred that the various combination groups of X graders (A1-A2, A1-A3, A1-B1, A1-B2, A1-B3, A2-A3, A2-B1, A2-B2, A2-B3, A3-B1, A3-B2, A3-B3, B1-B2, B1-B3 and B2-B3) were different on their Scores of Skill of Knowing beyond chance. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following table.

Table 5.T.37
Means, SD’s and t-ratios for difference in means of various combination groups due to interaction of Social Stress and Educational Aspirations

<table>
<thead>
<tr>
<th>Groups</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>41.18</td>
<td>37.97</td>
<td>42.03</td>
<td>43.00</td>
<td>40.69</td>
<td>37.49</td>
</tr>
<tr>
<td>S.D. ($\sigma$)</td>
<td>14.42</td>
<td>12.65</td>
<td>14.89</td>
<td>14.76</td>
<td>14.16</td>
<td>12.85</td>
</tr>
<tr>
<td>A1</td>
<td>-</td>
<td>2.36*</td>
<td>0.57</td>
<td>1.24</td>
<td>0.34</td>
<td>2.69**</td>
</tr>
<tr>
<td>A2</td>
<td>-</td>
<td>-</td>
<td>2.94**</td>
<td>3.64**</td>
<td>2.02*</td>
<td>0.37</td>
</tr>
<tr>
<td>A3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.65</td>
<td>0.91</td>
<td>3.26**</td>
</tr>
<tr>
<td>B1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.59</td>
<td>3.96**</td>
</tr>
<tr>
<td>B2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.37*</td>
</tr>
<tr>
<td>B3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
* Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

$H_{053.1}$: X graders having High (A1) and Average (A2) Social Stress will not be significantly different on Scores of Skill of Knowing.
$H_{053.2}$: X graders having High (A1) and Low (A3) Social Stress will not be significantly different on Scores of Skill of Knowing.
$H_{053.3}$: X graders having High Social Stress (A1) and High Educational Aspirations (B1) will not be significantly different on Scores of Skill of Knowing.
H053.4: X graders having High Social Stress (A1) and Average Educational Aspirations (B2) will not be significantly different on Scores of Skill of Knowing.

H053.5: X graders having High Social Stress (A1) and Low Educational Aspirations (B3) will not be significantly different on Scores of Skill of Knowing.

H053.6: X graders having Average (A2) and Low (A3) Social Stress will not be significantly different on Scores of Skill of Knowing.

H053.7: X graders having Average Social Stress (A2) and High Educational Aspirations (B1) will not be significantly different on Scores of Skill of Knowing.

H053.8: X graders having Average Social Stress (A2) and Average Educational Aspirations (B2) will not be significantly different on Scores of Skill of Knowing.

H053.9: X graders having Average Social Stress (A2) and Low Educational Aspirations (B3) will not be significantly different on Scores of Skill of Knowing.

H053.10: X graders having Low Social Stress (A3) and High Educational Aspirations (B1) will not be significantly different on Scores of Skill of Knowing.

H053.11: X graders having Low Social Stress (A3) and Average Educational Aspirations (B2) will not be significantly different on Scores of Skill of Knowing.

H053.12: X graders having Low Social Stress (A3) and Low Educational Aspirations (B3) will not be significantly different on Scores of Skill of Knowing.

H053.13: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

H053.14: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

H053.15: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Knowing.

As shown in Table 5.T.37, the t-ratios for the difference in means of scores on Skill of Knowing for X graders were found to be significant at the 0.01 level of confidence for the following combination groups viz:

- A1-B3, A2-A3, A2-B1, A3-B3 and B1-B3

Similarly, t-ratios for the difference in means of scores on Skill of Knowing for the group A1-A2, A2-B2 and B2-B3 was found to be significant at the 0.05 level of confidence. This indicated that all these groups were different in their mean scores beyond any chance factors. Therefore the corresponding hypotheses H053.1, H053.5, H053.6, H053.7, H053.8, H053.12, H053.14 and H053.15 were rejected at the specified levels. An examination of means of the two groups in each of the above mentioned combination groups led to the following conclusions:
Data Analysis And Results

- High Social Stress Group (A1) was higher on mean scores of Skill of Knowing \((M=41.18)\) as compared to their counterparts Group (A2) of Average Social Stress group \((M=37.97)\). Therefore, \(H_0\) 53.1 was rejected.
- High Social Stress Group (A1) achieved higher means on scores of Skill of Knowing \((M=41.18)\) than their counterparts in Low Educational Aspirations Group (B3) \((M=37.49)\). Therefore, \(H_0\) 53.5 was rejected.
- Low Social Stress Group (A3) achieved higher means on scores of Skill of Knowing \((M=42.03)\) than their counterparts in Average Social Stress Group (A2) \((M=37.97)\). Therefore, \(H_0\) 53.6 was rejected.
- High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Knowing \((M=43.00)\) than their counterparts in Average Social Stress Group (A2) \((M=37.97)\). Therefore, \(H_0\) 53.7 was rejected.
- Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Knowing \((M=40.69)\) than their counterparts in Average Social Stress Group (A2) \((M=37.97)\). Therefore, \(H_0\) 53.8 was rejected.
- Low Social Stress Group (A3) achieved higher means on scores of Skill of Knowing \((M=42.03)\) than their counterparts in Low Educational Aspirations Group (B3) \((M=37.49)\). Therefore, \(H_0\) 53.12 was rejected.
- High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Knowing \((M=43.00)\) than their counterparts in Low Educational Aspirations Group (B3) \((M=37.49)\). Therefore, \(H_0\) 53.14 was rejected.
- Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Knowing \((M=40.69)\) than their counterparts in Low Educational Aspirations Group (B3) \((M=37.49)\). Therefore, \(H_0\) 53.15 was rejected.

However, t-ratios for the difference in means of scores on Skill of Knowing for X graders in the following combination groups were not found to be significant even at the 0.05 level of confidence. These groups were:


The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses \(H_0\) 53.2, \(H_0\) 53.3, \(H_0\) 53.4, \(H_0\) 53.9, \(H_0\) 53.10, \(H_0\) 53.11 and \(H_0\) 53.13 were not rejected at the specified level. An examination of means on scores of Skill of Knowing for each of these combination groups led to the following conclusions:
• Mean on scores of Skill of Knowing of X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different. Therefore, H₀ 53.2 was not rejected.

• High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Knowing. Therefore, H₀ 53.3 was not rejected.

• High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Knowing. Therefore, H₀ 53.4 was not rejected.

• Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Knowing. Therefore, H₀ 53.9 was not rejected.

• Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Knowing. Therefore, H₀ 53.10 was not rejected.

• Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal means scores on Skill of Knowing. Therefore, H₀ 53.11 was not rejected.

• X graders having High (B1) and Average (B2) Educational Aspirations achieved equal mean scores on Skill of Knowing. Therefore, H₀ 53.13 was not rejected.

• **Two Order Interaction:**

  **Educational Aspirations × Socio-Economic Status (B×C)**

  Table 5.T.33 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Knowing for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀ 54 which stated that *there will be no significant interaction effect of Educational Aspiration and Socio-Economic Status on scores of Skill of Knowing for X graders* was not rejected at the specified level. It
may be concluded that **Educational Aspiration and Socio-Economic Status did not yield different mean scores on Skill of Knowing for X graders.**

- **Two Order Interaction:**

  **Socio-Economic Status × Social Stress (C×A)**

  Table 5.T.33 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders due to the interaction between Socio-Economic Status and Social Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Social Stress did not yield significantly different means on scores of Skill of Knowing for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ stated that **there will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of Skill of Knowing for X graders** was not rejected at the specified level. It may be concluded that Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Knowing for X graders.

- **Three Order Interaction:**

  **Social Stress × Educational Aspirations × Socio-Economic Status (A×B×C)**

  Table 5.T.33 shows that the F-ratio for the difference in means of scores on Skill of Knowing for X graders due to the interaction between Social Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Knowing for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ stated that **there will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Knowing for X graders** was not rejected at the specified level. It may be concluded that the three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Knowing for X graders.

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A similar set of analysis was applied on individual scores for Skill of Understanding.

**5.2.3.1: Descriptive Analysis of Scores on Skill of Understanding with Social Stress, Educational Aspirations and Socio-Economic Status**

Table 5.T.38
Mean, Standard Deviation, Skewness and Kurtosis on Scores of Skill of Understanding with Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Stress</td>
<td>High</td>
<td>198</td>
<td>40.00</td>
<td>15.20</td>
<td>0.550</td>
<td>-0.225</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>37.34</td>
<td>13.16</td>
<td>0.453</td>
<td>-0.330</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>41.39</td>
<td>15.02</td>
<td>0.353</td>
<td>-0.833</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>41.04</td>
<td>15.56</td>
<td>0.430</td>
<td>-0.643</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>40.28</td>
<td>14.93</td>
<td>0.399</td>
<td>-0.640</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>37.41</td>
<td>12.88</td>
<td>0.524</td>
<td>0.038</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>46.64</td>
<td>15.46</td>
<td>0.197</td>
<td>-0.742</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>37.27</td>
<td>13.41</td>
<td>0.435</td>
<td>-0.654</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>34.82</td>
<td>11.88</td>
<td>0.409</td>
<td>-0.620</td>
</tr>
</tbody>
</table>

Table 5.T.38 shows that mean values (M) of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were 40.00, 37.34 and 41.39 respectively. It indicated that the average of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were not equal. The mean Scores of X graders with Low Social Stress were highest among the mean scores of X graders with High and Average Social Stress. The **Standard Deviation (SD)** of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were 15.20, 13.16 and 15.02 respectively. The results indicated that Scores on Skill of Understanding for X graders with High Social Stress had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were 0.550, 0.453 and 0.353 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Social Stress was positively skewed. The values were within the acceptable limits of normality of...
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distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were -0.225, -0.330 and -0.833 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were Leptokurtic but more so, in case of Low Social Stress.

Table 5.T.38 shows that mean values (M) of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were 41.04, 40.28 and 37.41 respectively. It indicated that the average of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were not equal. The mean Scores of X graders with High Social Stress were highest among the mean scores of X graders with Average and Low Social Stress. The Standard Deviation (SD) of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were 15.56, 14.93 and 12.88 respectively. The results indicated that Scores on Skill of Understanding for X graders with High Social Stress had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were 0.430, 0.399 and 0.524 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Social Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were -0.643, -0.640 and 0.038 respectively, which indicated that the distribution of Scores on Skill of Understanding for X graders with High, Average and Low Social Stress were Leptokurtic but more so, in case of High Social Stress.

Table 5.T.38 shows that mean values (M) of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were 41.04, 40.28 and 37.41 respectively. It indicated that the average of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were 15.56, 14.93 and 12.88 respectively. The results indicated that Scores on Skill of Understanding for X graders with High Educational Aspirations had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were 0.430, 0.399 and 0.524 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were -0.643, -0.640 and 0.038 respectively, which indicated that the distribution of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.T.38 shows that mean values (M) of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were 46.64, 37.27 and 34.82 respectively. It indicated that the average of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status were not equal.
Socio-Economic Status. The **Standard Deviation (SD)** of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were 15.46, 13.41 and 11.88 respectively. The results indicated that Scores on Skill of Understanding for X graders with High Socio-Economic Status had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were 0.197, 0.435 and 0.409 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were -0.742, -0.654 and -0.620 respectively, which indicated that the distribution for Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.

![Figure 5.F.9: Mean Values of Scores on Skill of Understanding for X graders in Relation to Social Stress, Educational Aspirations and Socio-Economic Status](image-url)
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Since the differences in mean values of Scores on Skill of Understanding for X graders in relation to Social Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to 3x3x3 ANOVA on Scores of Skill of Understanding for X graders.

5.2.3.2: 3x3x3 ANOVA on Scores of Skill of Understanding in relation to Social Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a 3x3x3 design. The summary of 3x3x3 design has been presented in the Table 5.T.39 below:

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Main Effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Social Stress</td>
<td>1676.8</td>
<td>2</td>
<td>838.4</td>
<td>4.65**</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>1448.9</td>
<td>2</td>
<td>724.45</td>
<td>4.02*</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>15407.1</td>
<td>2</td>
<td>7703.55</td>
<td>42.78**</td>
</tr>
<tr>
<td>• Two Order Interactions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A*B</td>
<td>1736.7</td>
<td>4</td>
<td>434.175</td>
<td>2.41*</td>
</tr>
<tr>
<td>B*C</td>
<td>405.9</td>
<td>4</td>
<td>101.475</td>
<td>0.56</td>
</tr>
<tr>
<td>C*A</td>
<td>1110.3</td>
<td>4</td>
<td>277.575</td>
<td>1.54</td>
</tr>
<tr>
<td>• Three Order Interaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A<em>B</em>C</td>
<td>1930.8</td>
<td>8</td>
<td>241.35</td>
<td>1.34</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>102099.8</td>
<td>567</td>
<td>180.07019</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>125816.3</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

• Main Effect: Social Stress (A)

Table 5.T.39 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders with High, Average and Low Social Stress, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of scores on Skill of Understanding for X graders of High, Average and Low Social Stress groups. The null hypothesis H₀57 which stated
that *X graders having High, Average and Low Social Stress will not be significantly different on scores of Skill of Understanding* was rejected at the specified level. It may be inferred that the three groups of *X* graders were different on their scores of Skill of Understanding. To ascertain which group of *X* graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.40.

**Table 5.T.40**

Means, SD’s and t-ratios for difference in Skill of Understanding for High, Average and Low Levels of Social Stress

<table>
<thead>
<tr>
<th>Social Stress (A)</th>
<th>High Level (A1)</th>
<th>Average Level (A2)</th>
<th>Low Level (A3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>40.00</td>
<td>37.34</td>
<td>41.39</td>
</tr>
<tr>
<td><strong>S.D.(σ)</strong></td>
<td>15.20</td>
<td>13.16</td>
<td>15.02</td>
</tr>
<tr>
<td>High Level (A1)</td>
<td>-</td>
<td>1.87</td>
<td>0.92</td>
</tr>
<tr>
<td>Average Level (A2)</td>
<td>-</td>
<td>-</td>
<td><strong>2.87</strong>**</td>
</tr>
<tr>
<td>Low Level (A3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of confidence**

Following sub-hypotheses were tested through these t-ratios:

**H₀57.1**: *X* graders having High (A1) and Average (A2) Social Stress will not be significantly different on scores of Skill of Understanding.

**H₀57.2**: *X* graders having High (A1) and Low (A3) Social Stress will not be significantly different on scores of Skill of Understanding.

**H₀57.3**: *X* graders having Average (A2) and Low (A3) Social Stress will not be significantly different on scores of Skill of Understanding.

Table 5.T.40 shows that the t-ratio for the difference in means of scores on Skill of Understanding for *X* graders with High (A1) and Average (A2) Social Stress, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis **H₀57.1** which stated that *X graders having High (A1) and Average (A2) Social Stress will not be significantly different on scores of Skill of Understanding* was not rejected at the specified level. It may be concluded that *X* graders having High and Average Social Stress achieved equal mean scores on Skill of Understanding.

Table 5.T.40 shows that the t-ratio for the difference in means of scores on Skill of Understanding for *X* graders with High (A1) and Low (A3) Social Stress, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis **H₀57.2** which stated that *X graders having High (A1) and Low (A3) Social Stress will not be significantly different on scores of Skill of Understanding* was not rejected at the
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specified level. It may be concluded that X graders having High and Low Social Stress achieved equal mean scores on Skill of Understanding.

In Table 5.T.40, the t-ratio for the difference in means of scores on Skill of Understanding for X graders with Average (A2) and Low (A3) Social Stress was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with Average and Low Social Stress differed beyond the contribution of chance factors. The null hypothesis \( H_0 \) which stated that X graders having Average (A2) and Low (A3) Social Stress will not be significantly different on scores of Skill of Understanding was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Low Social Stress (M=41.39) was higher on scores of Skill of Understanding than their counterparts with Average Social Stress (M=37.34).

- **Main Effect: Educational Aspirations (B)**

Table 5.T.39 shows that the F-ratio for the difference in means of Scores on Skill of Understanding for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.05 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Understanding for X graders of High, Average and Low Educational Aspirations groups. The null hypothesis \( H_0 \) which stated that X graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Understanding was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of Skill of Understanding. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.41.

**Table 5.T.41**

Means, SD's and t-ratios for difference in Skill of Understanding for High, Average and Low Levels of Educational Aspirations

<table>
<thead>
<tr>
<th>Educational Aspirations (B)</th>
<th>High Level (B1)</th>
<th>Average Level (B2)</th>
<th>Low Level (B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>41.04</td>
<td>40.28</td>
<td>37.41</td>
</tr>
<tr>
<td>S.D.((\sigma))</td>
<td>15.56</td>
<td>14.93</td>
<td>12.88</td>
</tr>
<tr>
<td>High Level (B1)</td>
<td>-</td>
<td>0.49</td>
<td>2.53*</td>
</tr>
<tr>
<td>Average Level (B2)</td>
<td>-</td>
<td>-</td>
<td>2.05*</td>
</tr>
<tr>
<td>Low Level (B3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

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Following sub-hypotheses were tested through these t-ratios:

$H_0^{58.1}$: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.

$H_0^{58.2}$: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.

$H_0^{58.3}$: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.

Table 5.T.41 shows that the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (B1) and Average (B2) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{58.1}$ which stated that X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Understanding was not rejected at the specified level. It may be concluded that X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Understanding.

As shown in Table 5.T.41, the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.05 level of confidence. This indicated that the mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis $H_0^{58.2}$ which stated that X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Educational Aspirations ($M=41.04$) was higher on scores of Skill of Understanding than their counterparts with Low Educational Aspirations ($M=37.41$).

In Table 5.T.41, the t-ratio for the difference in Scores on Skill of Understanding for X graders with Average (B2) and Low (B3) Educational Aspirations was found to be significant at the 0.05 level of confidence. This indicated that the mean scores of students with Average and Low Educational Aspirations...
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differed beyond the contribution of chance factors. The null hypothesis $H_0 : 58.3$ which stated that *X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Understanding* was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Average Educational Aspirations ($M=40.28$) was higher on scores of Skill of Understanding than their counterparts with Low Educational Aspirations ($M=37.41$).

- **Main Effect : Socio-Economic Status (C)**

  Table 5.T.39 shows that the F-ratio for the difference in means of Scores on Skill of Understanding for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Understanding for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis $H_0 : 59$ which stated that *X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Understanding* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of skill of Understanding. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.42.

**Table 5.T.42**

Means, SD’s and t-ratios for difference in Skill of Understanding for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>46.64</td>
<td>37.27</td>
<td>34.82</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td>15.46</td>
<td>13.41</td>
<td>11.88</td>
</tr>
<tr>
<td><strong>High Level (C1)</strong></td>
<td>-</td>
<td>6.46**</td>
<td>8.56**</td>
</tr>
<tr>
<td><strong>Average Level (C2)</strong></td>
<td>-</td>
<td>-</td>
<td>1.92</td>
</tr>
<tr>
<td><strong>Low Level (C3)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of confidence**  
*Significant at 0.05 level of confidence
Following sub-hypotheses were tested through these t-ratios:

- **H₀₅₉.₁**: X graders having High (C₁) and Average (C₂) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding.
- **H₀₅₉.₂**: X graders having High (C₁) and Low (C₃) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding.
- **H₀₅₉.₃**: X graders having Average (C₂) and Low (C₃) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding.

In Table 5.T.42, the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (C₁) and Average (C₂) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis **H₀₅₉.₁** which stated that X graders having High (C₁) and Average (C₂) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=46.64) was higher on scores of Skill of Understanding than their counterparts with Average Socio-Economic Status (M=37.27).

As shown in Table 5.T.42, the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with High (C₁) and Low (C₃) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis **H₀₅₉.₂** which stated that X graders having High (C₁) and Low (C₃) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=46.64) was higher on scores of Skill of Understanding than their counterparts with Low Socio-Economic Status (M=34.82).

Table 5.T.42 shows that the t-ratio for the difference in means of Scores on Skill of Understanding for X graders with Average (C₂) and Low (C₃) Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. The observed difference in means may be ascribed to chance factors only. The null hypothesis **H₀₅₉.₃** which stated that X graders having Average (C₂) and Low (C₃) Socio-Economic Status will not be significantly different on Scores of Skill of Understanding was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Average Socio-Economic Status (M=37.27) was higher on scores of Skill of Understanding than their counterparts with Low Socio-Economic Status (M=34.82).
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*Socio-Economic Status will not be significantly different on Scores of Skill of Understanding* was not rejected at the specified level. It may be concluded that X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Understanding.

- **Two Order Interaction:**

  **Social Stress $\times$ Educational Aspirations ($A \times B$)**

  Table 5.T.39 shows that the F-ratio for the difference in means of Scores on Skill of Understanding for X graders due to the interaction between Social Stress and Educational Aspirations was found to be significant at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Scores of Skill of Understanding for X graders. The null hypothesis $H_0$ which stated that there will be no significant interaction effect of Social Stress and Educational Aspirations on scores of Skill of Understanding for X graders was rejected at the specified level. It may be inferred that the various combination groups of X graders (A1-A2, A1-A3, A1-B1, A1-B2, A1-B3, A2-A3, A2-B1, A2-B2, A2-B3, A3-B1, A3-B2, A3-B3, B1-B2, B1-B3 and B2-B3) were different on their Scores of Skill of Understanding beyond chance. To ascertain which groups of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following table.

  **Table 5.T.43**

  **Means, SD’s and t-ratios for difference in means of various combination groups due to interaction of Social Stress and Educational Aspirations**

<table>
<thead>
<tr>
<th>Groups</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>40.00</td>
<td>37.34</td>
<td>41.39</td>
<td>41.04</td>
<td>40.28</td>
<td>37.41</td>
</tr>
<tr>
<td>S.D.(o)</td>
<td>15.20</td>
<td>13.16</td>
<td>15.02</td>
<td>15.56</td>
<td>14.93</td>
<td>12.88</td>
</tr>
<tr>
<td>A1</td>
<td>-</td>
<td>1.87</td>
<td>0.92</td>
<td>0.67</td>
<td>0.18</td>
<td>1.83</td>
</tr>
<tr>
<td>A2</td>
<td>-</td>
<td>-</td>
<td>2.87**</td>
<td>2.56*</td>
<td>2.08*</td>
<td>0.05</td>
</tr>
<tr>
<td>A3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.22</td>
<td>0.74</td>
<td>2.84**</td>
</tr>
<tr>
<td>B1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.49</td>
<td>2.53*</td>
</tr>
<tr>
<td>B2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.05*</td>
</tr>
<tr>
<td>B3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
* Significant at 0.05 level of confidence
Following sub-hypotheses were tested through these t-ratios:

**H₀₆₀.1:** X graders having High (A₁) and Average (A₂) Social Stress will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.2:** X graders having High (A₁) and Low (A₃) Social Stress will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.3:** X graders having High Social Stress (A₁) and High Educational Aspirations (B₁) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.4:** X graders having High Social Stress (A₁) and Average Educational Aspirations (B₂) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.5:** X graders having High Social Stress (A₁) and Low Educational Aspirations (B₃) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.6:** X graders having Average (A₂) and Low (A₃) Social Stress will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.7:** X graders having Average Social Stress (A₂) and High Educational Aspirations (B₁) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.8:** X graders having Average Social Stress (A₂) and Average Educational Aspirations (B₂) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.9:** X graders having Average Social Stress (A₂) and Low Educational Aspirations (B₃) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.10:** X graders having Low Social Stress (A₃) and High Educational Aspirations (B₁) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.11:** X graders having Low Social Stress (A₃) and Average Educational Aspirations (B₂) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.12:** X graders having Low Social Stress (A₃) and Low Educational Aspirations (B₃) will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.13:** X graders having High (B₁) and Average (B₂) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.14:** X graders having High (B₁) and Low (B₃) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.

**H₀₆₀.15:** X graders having Average (B₂) and Low (B₃) Educational Aspirations will not be significantly different on Scores of Skill of Understanding.

As shown in Table 5.T.43, the t-ratios for the difference in means on scores of Skill of Understanding for X graders were found to be significant at the 0.01 level of confidence for the following combination groups viz:
Data Analysis And Results

- A2-A3 and A3-B3

Similarly, t-ratios for the difference in means of scores on Skill of Understanding for the groups A2-B1, A2-B2, B1-B3 and B2-B3 were found to be significant at the 0.05 level of confidence. This indicated that all these groups were different in their mean scores beyond any chance factors. Therefore the corresponding hypotheses \( H_{0.6}, H_{0.7}, H_{0.8}, H_{0.12}, H_{0.14} \) and \( H_{0.15} \) were rejected at the specified levels. An examination of means of the two groups in each of the above mentioned combination groups led to the following conclusions:

- Low Social Stress Group (A3) achieved higher means on scores of Skill of Understanding (\( M=41.39 \)) than their counterparts in Average Social Stress Group (A2) (\( M=37.34 \)). Therefore, \( H_{0.6} \) was rejected.
- High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Understanding (\( M=41.04 \)) than their counterparts in Average Social Stress Group (A2) (\( M=37.34 \)). Therefore, \( H_{0.7} \) was rejected.
- Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Understanding (\( M=40.28 \)) than their counterparts in Average Social Stress Group (A2) (\( M=37.34 \)). Therefore, \( H_{0.8} \) was rejected.
- Low Social Stress Group (A3) achieved higher means on scores of Skill of Understanding (\( M=41.39 \)) than their counterparts in Low Educational Aspirations Group (B3) (\( M=37.41 \)). Therefore, \( H_{0.12} \) was rejected.
- High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Understanding (\( M=41.04 \)) than their counterparts in Low Educational Aspirations Group (B3) (\( M=37.41 \)). Therefore, \( H_{0.14} \) was rejected.
- Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Understanding (\( M=40.28 \)) than their counterparts in Low Educational Aspirations Group (B3) (\( M=37.41 \)). Therefore, \( H_{0.15} \) was rejected.

However, t-ratios for the difference in means of scores on Skill of Understanding for X graders in the following combination groups were not found to be significant even at the 0.05 level of confidence. These groups were:


The observed differences in means of these groups may be ascribed to chance factor only. Hence the corresponding null hypotheses \( H_{0.1}, H_{0.2}, H_{0.3}, H_{0.4}, \) are
Data Analysis And Results

$H_0^{60.5}$, $H_0^{60.9}$, $H_0^{60.10}$, $H_0^{60.11}$ and $H_0^{60.13}$ were not rejected at the specified level. An examination of means on scores of Skill of Understanding of each of these combination groups led to the following conclusions:

- Mean scores on Skill of Understanding for X graders with High Social Stress (A1) and that of those in Average Social Stress (A2) were not different. Therefore, $H_0^{60.1}$ was not rejected.
- Mean scores on Skill of Understanding for X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different. Therefore, $H_0^{60.2}$ was not rejected.
- High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Understanding. Therefore, $H_0^{60.3}$ was not rejected.
- High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Understanding. Therefore, $H_0^{60.4}$ was not rejected.
- High Social Stress group (A1) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Understanding. Therefore, $H_0^{60.5}$ was not rejected.
- Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Understanding. Therefore, $H_0^{60.9}$ was not rejected.
- Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Understanding. Therefore, $H_0^{60.10}$ was not rejected.
- Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Understanding. Therefore, $H_0^{60.11}$ was not rejected.
- X graders having High (B1) and Average (B2) Educational Aspirations achieved equal mean scores on Skill of Understanding. Therefore, $H_0^{60.13}$ was not rejected.
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• Two Order Interaction:
Educational Aspirations × Socio-Economic Status (BxC)

Table 5.T.39 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Understanding for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{061}$ which stated that there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Understanding for X graders was not rejected at the specified level. It may be concluded that Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Understanding for X graders.

• Two Order Interaction:
Socio-Economic Status × Social Stress (CxA)

Table 5.T.39 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders due to the interaction between Socio-Economic Status and Social Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Social Stress did not yield significantly different means on scores of Skill of Understanding for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{062}$ which stated that there will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of Skill of Understanding for X graders was not rejected at the specified level. It may be concluded that Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Understanding for X graders.

• Three Order Interaction:
Social Stress × Educational Aspirations × Socio-Economic Status (AxBxC)

Table 5.T.39 shows that the F-ratio for the difference in means of scores on Skill of Understanding for X graders due to the interaction between Social Stress, Educational Aspirations and Socio-Economic Status was not found to be significant
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even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different on scores of Skill of Understanding for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ stated that there will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Understanding for X graders was not rejected at the specified level. It may be concluded that the three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Understanding for X graders.

5.2.4: ANALYSIS ON SCORES FOR SKILL OF ANALYSIS

Scores on Skill of Analysis were considered separately and descriptive & inferential statistical analyses were done.

5.2.4.1: Descriptive Analysis of Scores on Skill of Analysis with Social Stress, Educational Aspirations and Socio-Economic Status

Table 5.T.44

Mean, Standard Deviation, Skewness and Kurtosis on Scores of Skill of Analysis with Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Stress</td>
<td>High</td>
<td>198</td>
<td>36.50</td>
<td>14.01</td>
<td>0.451</td>
<td>-0.380</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>34.76</td>
<td>13.29</td>
<td>0.571</td>
<td>-0.360</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>35.43</td>
<td>14.70</td>
<td>0.688</td>
<td>-0.208</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>37.37</td>
<td>15.37</td>
<td>0.496</td>
<td>-0.488</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>35.69</td>
<td>13.70</td>
<td>0.542</td>
<td>-0.401</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>33.63</td>
<td>12.64</td>
<td>0.588</td>
<td>-0.262</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>41.97</td>
<td>16.10</td>
<td>0.146</td>
<td>-0.862</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>33.05</td>
<td>11.76</td>
<td>0.503</td>
<td>-0.324</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>31.67</td>
<td>11.42</td>
<td>0.507</td>
<td>-0.670</td>
</tr>
</tbody>
</table>

Table 5.T.44 shows that mean values (M) of Scores on Skill of Analysis for X graders with High, Average and Low Social Stress were 36.50, 34.76 and 35.43 respectively. It indicated that the average of Scores on Skill of Analysis for X graders with High, Average and Low Social Stress were not equal. The mean Scores of X graders with High Social Stress were highest among the mean scores of X graders with Average and Low Social Stress. The Standard Deviation (SD) of Scores on
Skill of Analysis for X graders with High, Average and Low Social Stress were 14.01, 13.29 and 14.70 respectively. The results indicated that Scores on Skill of Analysis for X graders with Low Social Stress had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Analysis for X graders with High, Average and Low Social Stress were 0.451, 0.571 and 0.688 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Social Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Analysis for X graders with High, Average and Low Social Stress were -0.380, -0.360 and -0.208 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Social Stress were Leptokurtic but more so, in case of High Social Stress.

Table 5.T.44 shows that **mean values (M)** of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were 37.37, 35.69 and 33.63 respectively. It indicated that the average of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The **Standard Deviation (SD)** of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were 15.37, 13.70 and 12.64 respectively. The results indicated that Scores on Skill of Analysis for X graders with High Educational Aspirations had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were 0.496, 0.542 and 0.588 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were -0.488, -0.401 and -0.262 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.T.44 shows that **mean values (M)** of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were 41.97, 33.05 and 32.2 respectively.
31.67 respectively. It indicated that the average of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The **Standard Deviation (SD)** of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were 16.10, 11.76 and 11.42 respectively. The results indicated that Scores on Skill of Analysis for X graders with High Socio-Economic Status had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were 0.146, 0.503 and 0.507 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were -0.862, -0.324 and -0.670 respectively, which indicated that the distribution for Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.

![Figure 5.F.10: Mean Values of Scores on Skill of Analysis for X graders in Relation to Social Stress, Educational Aspirations and Socio-Economic Status](image-url)

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Since the differences in mean values of Scores on Skill of Analysis for X graders in relation to Social Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to 3x3x3 ANOVA on Scores of Skill of Analysis for X graders.

5.2.4.2: 3x3x3 ANOVA on Scores of Skill of Analysis in relation to Social Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a 3x3x3 design. The summary of 3x3x3 design has been presented in the Table 5.T.45 below:

Table 5.T.45
Sum of Squares, Mean Sum of Squares and F-ratio on Scores of Skill of Analysis for X graders in relation to Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Social Stress</td>
<td>305.9</td>
<td>2</td>
<td>152.95</td>
<td>0.88</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>1395</td>
<td>2</td>
<td>697.5</td>
<td>4.01*</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>12380.2</td>
<td>2</td>
<td>6190.1</td>
<td>35.64**</td>
</tr>
<tr>
<td><strong>Two Order Interactions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxB</td>
<td>620.4</td>
<td>4</td>
<td>155.1</td>
<td>0.89</td>
</tr>
<tr>
<td>BxC</td>
<td>976.2</td>
<td>4</td>
<td>244.05</td>
<td>1.40</td>
</tr>
<tr>
<td>CxA</td>
<td>1222.8</td>
<td>4</td>
<td>305.7</td>
<td>1.76</td>
</tr>
<tr>
<td><strong>Three Order Interaction:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxBxC</td>
<td>1079.8</td>
<td>8</td>
<td>134.975</td>
<td>0.77</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>98475.6</td>
<td>567</td>
<td>173.67831</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>116455.9</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

- **Main Effect : Social Stress (A)**

Table 5.T.45 shows that the F-ratio for the difference in means of Scores on Skill of Analysis for X graders with High, Average and Low Social Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Analysis for X graders of High, Average and Low Social Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ which stated that X graders
having High, Average and Low Social Stress will not be significantly different on Scores of Skill of Analysis was not rejected at the specified level. It may be concluded that X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Analysis.

- **Main Effect : Educational Aspirations (B)**

Table 5.T.45 shows that the F-ratio for the difference in means of Scores on Skill of Analysis for X graders with High, Average and Low Educational Aspirations, was found to be significant at the 0.05 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Analysis for X graders of High, Average and Low Educational Aspirations groups. The null hypothesis $H_0$ which stated that $X$ graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Analysis was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of Skill of Analysis. To ascertain which group of X graders were significantly different, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.46.

**Table 5.T.46**

Means, SD’s and t-ratios for difference in Skill of Analysis for High, Average and Low Levels of Educational Aspirations

<table>
<thead>
<tr>
<th>Educational Aspirations (B)</th>
<th>High Level (B1)</th>
<th>Average Level (B2)</th>
<th>Low Level (B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>37.37</td>
<td>35.69</td>
<td>33.63</td>
</tr>
<tr>
<td>S.D. (σ)</td>
<td>15.37</td>
<td>13.70</td>
<td>12.64</td>
</tr>
<tr>
<td>High Level (B1)</td>
<td>-</td>
<td>1.15</td>
<td>2.65**</td>
</tr>
<tr>
<td>Average Level (B2)</td>
<td>-</td>
<td>-</td>
<td>1.56</td>
</tr>
<tr>
<td>Low Level (B3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
* Significant at 0.05 level of confidence

Following sub-hypotheses were tested through these t-ratios:

$H_{065.1}$: X graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Analysis.

$H_{065.2}$: X graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis.

$H_{065.3}$: X graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis.
Table 5.T.46 shows that the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with High (B1) and Average (B2) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_065.1$ which stated that $X$ graders having High (B1) and Average (B2) Educational Aspirations will not be significantly different on Scores of Skill of Analysis was not rejected at the specified level. It may be concluded that $X$ graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Analysis.

As shown in Table 5.T.46, the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with High (B1) and Low (B3) Educational Aspirations was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Educational Aspirations differed beyond the contribution of chance factors. The null hypothesis $H_065.2$ which stated that $X$ graders having High (B1) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Educational Aspirations ($M=37.37$) was higher on scores of Skill of Analysis than their counterparts with Low Educational Aspirations ($M=33.63$).

Table 5.T.46 shows that the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with Average (B2) and Low (B3) Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_065.3$ which stated that $X$ graders having Average (B2) and Low (B3) Educational Aspirations will not be significantly different on Scores of Skill of Analysis was not rejected at the specified level. It may be concluded that $X$ graders having Average and Low Educational Aspirations achieved equal mean scores on Skill of Analysis.

**Main Effect : Socio-Economic Status (C)**

Table 5.T.45 shows that the F-ratio for the difference in means of Scores on Skill of Analysis for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was
significant difference in means of Scores on Skill of Analysis for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis $H_{066}$ which stated that *X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Analysis* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of skill of Analysis. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.47.

**Table 5.T.47**

Means, SD’s and t-ratios for difference in Skill of Analysis for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>41.97</td>
<td>33.05</td>
<td>31.67</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>16.10</td>
<td>11.76</td>
<td>11.42</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>6.32**</td>
<td>7.35**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>1.18</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of confidence**

Following sub-hypotheses were tested through these t-ratios:

- $H_{066.1}$: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis.
- $H_{066.2}$: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis.
- $H_{066.3}$: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis.

In Table 5.T.47, the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with High (C1) and Average (C2) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Average Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{066.1}$ which stated that *X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis* was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=41.97) was higher on scores of...
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Skill of Analysis than their counterparts with Average Socio-Economic Status (M=33.05).

As shown in Table 5.T.47, the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis Ho66.2 which stated that X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=41.97) was higher on scores of Skill of Analysis than their counterparts with Low Socio-Economic Status (M=31.67).

Table 5.T.47 shows that the t-ratio for the difference in means of Scores on Skill of Analysis for X graders with Average (C2) and Low (C3) Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis Ho66.3 which stated that X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Analysis was not rejected at the specified level. It may be concluded that X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Analysis.

- Two Order Interaction:

Social Stress × Educational Aspirations (A×B)

Table 5.T.45 shows that the F-ratio for the difference in means of scores on Skill of Analysis for X graders due to the interaction between Social Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress and Educational Aspirations did not yield significantly different means on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis H67 which stated that there will be no significant interaction effect of Social Stress and Educational Aspirations on scores of Skill of Analysis for X graders was not rejected at the specified level. It may be concluded that Social Stress and Educational Aspirations did not yield different mean scores on Skill of Analysis for X graders.
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- Two Order Interaction:

  Educational Aspirations × Socio-Economic Status (B×C)

  Table 5.T.45 shows that the F-ratio for the difference in means of scores on Skill of Analysis for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀ which stated that there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Analysis for X graders was not rejected at the specified level. It may be concluded that Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Analysis for X graders.

- Two Order Interaction:

  Socio-Economic Status × Social Stress (C×A)

  Table 5.T.45 shows that the F-ratio for the difference in means of scores on Skill of Analysis for X graders due to the interaction between Socio-Economic Status and Social Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Social Stress did not yield significantly different means on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀ which stated that there will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of Skill of Analysis for X graders was not rejected at the specified level. It may be concluded that Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Analysis for X graders.

- Three Order Interaction:

  Social Stress × Educational Aspirations × Socio-Economic Status (A×B×C)

  Table 5.T.45 shows that the F-ratio for the difference in means of scores on Skill of Analysis for X graders due to the interaction between Social Stress, Educational Aspirations and Socio-Economic Status was not found to be significant.
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even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different on scores of Skill of Analysis for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ which stated that there will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Analysis for X graders was not rejected at the specified level. It may be concluded that the three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Analysis for X graders.

### 5.2.5: ANALYSIS ON SCORES FOR SKILL OF APPLYING

Scores on Skill of Applying were considered separately and descriptive & inferential statistical analyses were done.

#### 5.2.5.1: Descriptive Analysis of Scores on Skill of Applying with Social Stress, Educational Aspirations and Socio-Economic Status

**Table 5.148**

Mean, Standard Deviation, Skewness and Kurtosis on Scores of Skill of Applying with Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Stress</td>
<td>High</td>
<td>198</td>
<td>34.08</td>
<td>13.08</td>
<td>0.452</td>
<td>-0.470</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>33.05</td>
<td>12.11</td>
<td>0.519</td>
<td>-0.487</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>34.78</td>
<td>12.78</td>
<td>0.332</td>
<td>-0.711</td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td>High</td>
<td>198</td>
<td>35.61</td>
<td>13.15</td>
<td>0.278</td>
<td>-0.861</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>33.20</td>
<td>12.54</td>
<td>0.493</td>
<td>-0.462</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>33.11</td>
<td>12.17</td>
<td>0.535</td>
<td>-0.215</td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td>High</td>
<td>198</td>
<td>34.91</td>
<td>13.87</td>
<td>0.492</td>
<td>-0.571</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>198</td>
<td>34.56</td>
<td>12.35</td>
<td>0.368</td>
<td>-0.579</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>198</td>
<td>32.44</td>
<td>11.58</td>
<td>0.304</td>
<td>-0.969</td>
</tr>
</tbody>
</table>

**Table 5.148** shows that mean values (M) of Scores on Skill of Applying for X graders with High, Average and Low Social Stress were 34.08, 33.05 and 34.78 respectively. It indicated that the average of Scores on Skill of Applying for X graders with High, Average and Low Social Stress were not equal. The mean Scores of X graders with Low Social Stress were highest among the mean scores of X graders with High and Average Social Stress. The Standard Deviation (SD) of Scores on
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Skill of Applying for X graders with High, Average and Low Social Stress were 13.08, 12.11 and 12.78 respectively. The results indicated that Scores on Skill of Applying for X graders with High Social Stress had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Applying for X graders with High, Average and Low Social Stress were 0.452, 0.519 and 0.332 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Social Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Applying for X graders with High, Average and Low Social Stress were -0.470, -0.487 and -0.711 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Social Stress were Leptokurtic but more so, in case of Low Social Stress.

Table 5.7.48 shows that mean values (M) of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were 35.61, 33.20 and 33.11 respectively. It indicated that the average of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The **Standard Deviation (SD)** of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were 13.15, 12.54 and 12.17 respectively. The results indicated that Scores on Skill of Applying for X graders with High Educational Aspirations had yielded the most diversity. **Skewness (Sk)** value of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were 0.278, 0.493 and 0.535 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. **Kurtosis (Ku)** value of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were -0.861, -0.462 and -0.215 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.7.48 shows that mean values (M) of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were 34.91, 34.56 and
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32.44 respectively. It indicated that the average of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were 13.87, 12.35 and 11.58 respectively. The results indicated that Scores on Skill of Applying for X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were 0.492, 0.368 and 0.304 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were -0.571, -0.579 and -0.969 respectively, which indicated that the distribution for Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of Low Socio-Economic Status.

Figure 5.F.11: Mean Values of Scores on Skill of Applying for X graders in Relation to Social Stress, Educational Aspirations and Socio-Economic Status
Since the differences in mean values of Scores on Skill of Applying for X graders in relation to Social Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to $3 \times 3 \times 3$ ANOVA on Scores of Skill of Applying for X graders.

**5.2.5.2: $3 \times 3 \times 3$ ANOVA on Scores of Skill of Applying in relation to Social Stress, Educational Aspirations and Socio-Economic Status**

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a $3 \times 3 \times 3$ design. The summary of $3 \times 3 \times 3$ design has been presented in the Table 5.1.49 below:

**Table 5.1.49**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Social Stress</td>
<td>299.1</td>
<td>2</td>
<td>149.55</td>
<td>0.93</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>796.1</td>
<td>2</td>
<td>398.05</td>
<td>2.48</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>708.3</td>
<td>2</td>
<td>354.15</td>
<td>2.21</td>
</tr>
<tr>
<td><strong>Two Order Interactions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxB</td>
<td>815.6</td>
<td>4</td>
<td>203.9</td>
<td>1.27</td>
</tr>
<tr>
<td>BxC</td>
<td>819.9</td>
<td>4</td>
<td>204.975</td>
<td>1.28</td>
</tr>
<tr>
<td>CxA</td>
<td>558.1</td>
<td>4</td>
<td>139.525</td>
<td>0.87</td>
</tr>
<tr>
<td><strong>Three Order Interaction:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxBxC</td>
<td>478.6</td>
<td>8</td>
<td>59.825</td>
<td>0.37</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>90653</td>
<td>567</td>
<td>159.88183</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>95128.7</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Main Effect : Social Stress (A)**

Table 5.1.49 shows that the F-ratio for the difference in means of Scores on Skill of Applying for X graders with High, Average and Low Social Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Applying for X graders of High, Average and Low Social Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ which stated that $X$ graders...
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having High, Average and Low Social Stress will not be significantly different on Scores of Skill of Applying was not rejected at the specified level. It may be concluded that X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Applying.

- Main Effect: Educational Aspirations (B)

Table 5.T.49 shows that the F-ratio for the difference in means of Scores on Skill of Applying for X graders with High, Average and Low Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Applying for X graders of High, Average and Low Educational Aspirations groups. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0^{72} \) which stated that X graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Applying was not rejected at the specified level. It may be concluded that X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Applying.

- Main Effect: Socio-Economic Status (C)

Table 5.T.49 shows that the F-ratio for the difference in means of Scores on Skill of Applying for X graders with High, Average and Low Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Applying for X graders of High, Average and Low Socio-Economic Status groups. The difference if observed may be ascribed to chance factors only. The null hypothesis \( H_0^{73} \) which stated that X graders having High, Average and Low Socio-Economic Status will not be significantly different on Scores of Skill of Applying was not rejected at the specified level. It may be concluded that X graders having High, Average and Low Socio-Economic Status achieved equal mean scores on Skill of Applying.

- Two Order Interaction:

Social Stress \times Educational Aspirations (A\times B)

Table 5.T.49 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Social Stress and Educational Aspirations was not found to be significant even at the 0.05 level of
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It suggested that the interaction effect of Social Stress and Educational Aspirations did not yield significantly different means on scores of Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{074}$ which stated that there will be no significant interaction effect of Social Stress and Educational Aspirations on scores of Skill of Applying for X graders was not rejected at the specified level. It may be concluded that Social Stress and Educational Aspirations did not yield different mean scores on Skill of Applying for X graders.

- **Two Order Interaction:**
  
  **Educational Aspirations $\times$ Socio-Economic Status (B$\times$C)
  
  Table 5.T.49 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{075}$ which stated that there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Applying for X graders was not rejected at the specified level. It may be concluded that Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Applying for X graders.

- **Two Order Interaction:**
  
  **Socio-Economic Status $\times$ Social Stress (C$\times$A)
  
  Table 5.T.49 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Socio-Economic Status and Social Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Social Stress did not yield significantly different means on scores of Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{076}$ which stated that there will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of Skill of Applying for X graders was not rejected at the specified level. It may be concluded that Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Applying for X graders.
Three Order Interaction:
Social Stress × Educational Aspirations × Socio-Economic Status
(A×B×C)

Table 5.T.49 shows that the F-ratio for the difference in means of scores on Skill of Applying for X graders due to the interaction between Social Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different on scores on Skill of Applying for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ which stated that there will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Applying for X graders was not rejected at the specified level. It may be concluded that the three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Applying for X graders.

5.2.6: ANALYSIS ON SCORES FOR SKILL OF SOLVING

Scores on Skill of Solving were considered separately and descriptive & inferential statistical analyses were done.

5.2.6.1: Descriptive Analysis of Scores on Skill of Solving with Social Stress, Educational Aspirations and Socio-Economic Status

Table 5.T.50

Mean, Standard Deviation, Skewness and Kurtosis on Scores of Skill of Solving with Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sk</th>
<th>Ku</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>198</td>
<td>31.09</td>
<td>11.94</td>
<td>0.395</td>
<td>-0.682</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>198</td>
<td>31.59</td>
<td>12.42</td>
<td>0.547</td>
<td>-0.549</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>198</td>
<td>32.24</td>
<td>12.32</td>
<td>0.774</td>
<td>0.180</td>
<td></td>
</tr>
<tr>
<td>Educational Aspirations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>198</td>
<td>32.45</td>
<td>11.67</td>
<td>0.459</td>
<td>-0.476</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>198</td>
<td>32.22</td>
<td>13.03</td>
<td>0.619</td>
<td>-0.246</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>198</td>
<td>30.25</td>
<td>11.85</td>
<td>0.628</td>
<td>-0.328</td>
<td></td>
</tr>
<tr>
<td>Socio-Economic Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>198</td>
<td>33.14</td>
<td>13.02</td>
<td>0.464</td>
<td>-0.477</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>198</td>
<td>32.28</td>
<td>12.48</td>
<td>0.564</td>
<td>-0.371</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>198</td>
<td>29.50</td>
<td>10.80</td>
<td>0.597</td>
<td>-0.341</td>
<td></td>
</tr>
</tbody>
</table>
Table 5.T.50 shows that mean values (M) of Scores on Skill of Solving for X graders with High, Average and Low Social Stress were 31.09, 31.59 and 32.24 respectively. It indicated that the average of Scores on Skill of Solving for X graders with High, Average and Low Social Stress were not equal. The mean Scores of X graders with Low Social Stress were highest among the mean scores of X graders with High and Average Social Stress. The Standard Deviation (SD) of Scores on Skill of Solving for X graders with High, Average and Low Social Stress were 11.94, 12.42 and 12.32 respectively. The results indicated that Scores on Skill of Solving for X graders with Average Social Stress had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Solving for X graders with High, Average and Low Social Stress were 0.395, 0.547 and 0.774 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Social Stress was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Solving for X graders with High, Average and Low Social Stress were -0.682, -0.549 and 0.180 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Social Stress were Leptokurtic but more so, in case of High Social Stress.

Table 5.T.50 shows that mean values (M) of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were 32.45, 32.22 and 30.25 respectively. It indicated that the average of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were not equal. The mean Scores of X graders with High Educational Aspirations were highest among the mean scores of X graders with Average and Low Educational Aspirations. The Standard Deviation (SD) of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were 11.67, 13.03 and 11.85 respectively. The results indicated that Scores on Skill of Solving for X graders with Average Educational Aspirations had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were 0.459, 0.619 and 0.628 respectively, which indicated that the
Data Analysis And Results

distribution for Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were -0.476, -0.246 and -0.328 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations were Leptokurtic but more so, in case of High Educational Aspirations.

Table 5.T.50 shows that mean values (M) of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were 33.14, 32.28 and 29.50 respectively. It indicated that the average of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were not equal. The mean Scores of X graders with High Socio-Economic Status were highest among the mean scores of X graders with Average and Low Socio-Economic Status. The Standard Deviation (SD) of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were 13.02, 12.48 and 10.80 respectively. The results indicated that Scores on Skill of Solving for X graders with High Socio-Economic Status had yielded the most diversity. Skewness (Sk) value of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were 0.464, 0.564 and 0.597 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status was positively skewed. The values were within the acceptable limits of normality of distribution (±1), hence the distribution of the measure was moderately normal. Kurtosis (Ku) value of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were -0.477, -0.371 and -0.341 respectively, which indicated that the distribution for Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status were Leptokurtic but more so, in case of High Socio-Economic Status.
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Since the differences in mean values of Scores on Skill of Solving for X graders in relation to Social Stress, Educational Aspirations and their Socio-Economic Status have been observed. Hence the data were subjected to 3×3×3 ANOVA on Scores of Skill of Solving for X graders.

5.2.6.2: 3×3×3 ANOVA on Scores of Skill of Solving in relation to Social Stress, Educational Aspirations and Socio-Economic Status

The Sum of Squares, Mean Sum of Squares and F-ratios were computed for main effects and interaction effects of various independent variables employing a 3×3×3 design. The summary of 3×3×3 design has been presented in the Table 5.T.51 below:
Data Analysis And Results

Table 5.T.51
Sum of Squares, Mean Sum of Squares and F-ratio on Scores of Skill of Solving for X graders in relation to Social Stress, Educational Aspirations and Socio-Economic Status

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares (S.S.)</th>
<th>Degree of Freedom (d.f.)</th>
<th>Mean Sum of Squares (M.S.)</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Main Effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Social Stress</td>
<td>130.8</td>
<td>2</td>
<td>65.4</td>
<td>0.45</td>
</tr>
<tr>
<td>B: Educational Aspirations</td>
<td>580.8</td>
<td>2</td>
<td>290.4</td>
<td>2.00</td>
</tr>
<tr>
<td>C: Socio-Economic Status</td>
<td>1433.6</td>
<td>2</td>
<td>716.8</td>
<td>4.94**</td>
</tr>
<tr>
<td>* Two Order Interactions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A*B</td>
<td>1037.7</td>
<td>4</td>
<td>259.425</td>
<td>1.79</td>
</tr>
<tr>
<td>B*C</td>
<td>488.8</td>
<td>4</td>
<td>122.2</td>
<td>0.84</td>
</tr>
<tr>
<td>C*A</td>
<td>295</td>
<td>4</td>
<td>73.75</td>
<td>0.50</td>
</tr>
<tr>
<td>* Three Order Interaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A<em>B</em>C</td>
<td>1661.4</td>
<td>8</td>
<td>207.675</td>
<td>1.43</td>
</tr>
<tr>
<td>Error: Within Variables</td>
<td>82154</td>
<td>567</td>
<td>144.89242</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>87782.1</td>
<td>593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  *Significant at 0.05 level of confidence

• Main Effect : Social Stress (A)

Table 5.T.51 shows that the F-ratio for the difference in means of Scores on Skill of Solving for X graders with High, Average and Low Social Stress, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Solving for X graders of High, Average and Low Social Stress groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0$ which stated that X graders having High, Average and Low Social Stress will not be significantly different on Scores of Skill of Solving was not rejected at the specified level. It may be concluded that X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Solving.

• Main Effect : Educational Aspirations (B)

Table 5.T.51 shows that the F-ratio for the difference in means of Scores on Skill of Solving for X graders with High, Average and Low Educational Aspirations, was not found to be significant even at the 0.05 level of confidence. It suggested that there was no significant difference in means of Scores on Skill of Solving for X
graders of High, Average and Low Educational Aspirations groups. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{79}$ which stated that *X graders having High, Average and Low Educational Aspirations will not be significantly different on Scores of Skill of Solving* was not rejected at the specified level. It may be concluded that *X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Solving.*

- **Main Effect: Socio-Economic Status (C)**

  Table 5.T.51 shows that the F-ratio for the difference in means of Scores on Skill of Solving for X graders with High, Average and Low Socio-Economic Status, was found to be significant at the 0.01 level of confidence. It suggested that there was significant difference in means of Scores on Skill of Solving for X graders of High, Average and Low Socio-Economic Status groups. The null hypothesis $H_0^{80}$ which stated that *X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Solving* was rejected at the specified level. It may be inferred that the three groups of X graders were different on their scores of skill of Solving. To ascertain which group of X graders were significantly different from each other, t-test was applied for various combination groups and corresponding t-ratios have been presented in the following Table 5.T.52.

Table 5.T.52
Means, SD’s and t-ratios for difference in Skill of Solving for High, Average and Low Levels of Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status (C)</th>
<th>High Level (C1)</th>
<th>Average Level (C2)</th>
<th>Low Level (C3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>M</td>
<td>33.14</td>
<td>32.28</td>
<td>29.50</td>
</tr>
<tr>
<td>S.D.(σ)</td>
<td>13.02</td>
<td>12.48</td>
<td>10.80</td>
</tr>
<tr>
<td>High Level (C1)</td>
<td>-</td>
<td>0.67</td>
<td>3.03**</td>
</tr>
<tr>
<td>Average Level (C2)</td>
<td>-</td>
<td>-</td>
<td>2.37*</td>
</tr>
<tr>
<td>Low Level (C3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of confidence  
* Significant at 0.05 level of confidence
Following sub-hypotheses were tested through these t-ratios:

- $H_{0.1}$: X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Solving.
- $H_{0.2}$: X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving.
- $H_{0.3}$: X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving.

Table 5.T.52 shows that the t-ratio for the difference in means of Scores on Skill of Solving for X graders with High (C1) and Average (C2) Socio-Economic Status, was not found to be significant even at the 0.05 level of confidence. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_{0.1}$ which stated that X graders having High (C1) and Average (C2) Socio-Economic Status will not be significantly different on Scores of Skill of Solving was not rejected at the specified level. It may be concluded that X graders having High and Average Socio-Economic Status achieved equal mean scores on Skill of Solving.

As shown in Table 5.T.52, the t-ratio for the difference in means of Scores on Skill of Solving for X graders with High (C1) and Low (C3) Socio-Economic Status was found to be significant at the 0.01 level of confidence. This indicated that the mean scores of students with High and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{0.2}$ which stated that X graders having High (C1) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with High Socio-Economic Status (M=33.14) was higher on scores of Skill of Solving than their counterparts with Low Socio-Economic Status (M=29.50).

As shown in Table 5.T.52, the t-ratio for the difference in means of Scores on Skill of Solving for X graders with Average (C2) and Low (C3) Socio-Economic Status was found to be significant at the 0.05 level of confidence. This indicated that the mean scores of students with Average and Low Socio-Economic Status differed beyond the contribution of chance factors. The null hypothesis $H_{0.3}$ which stated...
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that X graders having Average (C2) and Low (C3) Socio-Economic Status will not be significantly different on Scores of Skill of Solving was therefore rejected at the specified level. A probe into means led to conclude that the mean achievement of X graders with Average Socio-Economic Status (M=32.28) was higher on scores of Skill of Solving than their counterparts with Low Socio-Economic Status (M=29.50).

• Two Order Interaction:
  Social Stress × Educational Aspirations (A×B)
  Table 5.T.51 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Social Stress and Educational Aspirations was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress and Educational Aspirations did not yield significantly different means on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{81}$ which stated that there will be no significant interaction effect of Social Stress and Educational Aspirations on scores of Skill of Solving for X graders was not rejected at the specified level. It may be concluded that Social Stress and Educational Aspirations did not yield different mean scores on Skill of Solving for X graders.

• Two Order Interaction:
  Educational Aspirations × Socio-Economic Status (B×C)
  Table 5.T.51 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Educational Aspirations and Socio-Economic Status did not yield significantly different means on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis $H_0^{82}$ which stated that there will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of Skill of Solving for X graders was not rejected at the specified level. It may be concluded that Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Solving for X graders.
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- **Two Order Interaction:**
  *Socio-Economic Status × Social Stress (C×A)*

  Table 5.T.51 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Socio-Economic Status and Social Stress was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Socio-Economic Status and Social Stress did not yield significantly different means on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀,83 which stated that *there will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of Skill of Solving for X graders* was not rejected at the specified level. It may be concluded that Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Solving for X graders.

- **Three Order Interaction:**
  *Social Stress × Educational Aspirations × Socio-Economic Status (A×B×C)*

  Table 5.T.51 shows that the F-ratio for the difference in means of scores on Skill of Solving for X graders due to the interaction between Social Stress, Educational Aspirations and Socio-Economic Status was not found to be significant even at the 0.05 level of confidence. It suggested that the interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status did not yield significantly different on scores of Skill of Solving for X graders. The difference if observed may be ascribed to chance factors only. The null hypothesis H₀,84 which stated that *there will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of Skill of Solving for X graders* was not rejected at the specified level. It may be concluded that the three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Solving for X graders.
SECTION III

5.3: CONCLUSIONS

5.3.1: CONCLUSIONS BASED ON ANALYSES OF MATHEMATICAL COGNITIVE SKILLS (TOTAL SCORES) AND SCORES ON EACH OF THE INDIVIDUAL MATHEMATICAL COGNITIVE SKILLS IN RELATION TO ACADEMIC STRESS, EDUCATIONAL ASPIRATIONS AND SOCIO-ECONOMIC STATUS

Major conclusions drawn from the analyses reported in Section I have been summarized below:

5.3.1.1: Conclusions based on analyses on Total Scores of Mathematical Cognitive Skills

Main Effects:

- X graders having High, Average and Low Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.
- X graders having High, Average and Low Educational Aspirations were significantly different on means of Total scores for Mathematical Cognitive Skills.
  - X graders having High and Average Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills.
  - The mean achievement of X graders with High Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.
  - The mean achievement of X graders with Average Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.
- X graders having High, Average and Low Socio-Economic Status were significantly different on means of Total scores for Mathematical Cognitive Skills.
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❖ The mean achievement of X graders with High Socio-Economic Status was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Average Socio-Economic Status.
❖ The mean achievement of X graders with High Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.
❖ The mean achievement of X graders with Average Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.

Two Order Interactions:
- Academic Stress and Educational Aspirations did not yield different means on Total scores of Mathematical Cognitive Skills for X graders.
- The interaction effect of Educational Aspirations and Socio-Economic Status yielded significantly different means on Total Scores of Mathematical Cognitive Skills for X graders.
❖ Mean of Total scores on Mathematical Cognitive Skills of X graders with High Educational Aspirations (B1) and that of those in Average Educational Aspirations (B2) were not different.
❖ High Educational Aspirations Group (B1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts (Group B3) of Low Educational Aspirations group.
❖ High Socio-Economic Status Group (C1) performed higher on means of Total scores of Mathematical Cognitive Skills as compared to High Educational Aspirations Group (B1).
❖ High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
❖ High Educational Aspirations Group (B1) achieved higher means on Total scores of Cognitive Skills in Mathematics as compared to their counterparts in Group of X graders with Low Socio-Economic Status (C3).
❖ Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).
High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Educational Aspirations (B2).

Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

Low Educational Aspirations group (B3) of X graders and that of Average Socio-Economic Status (C2) achieved equal means of Total scores on Mathematical Cognitive Skills.

Low Educational Aspirations Group (B3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

The interaction effect of Socio-Economic Status and Academic Stress yielded significantly different means of Total Scores on Mathematical Cognitive Skills for X graders.

High Socio-Economic Status Group (C1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts (Group C2) of Average Socio-Economic Status group.
Data Analysis And Results

- High Socio-Economic Status Group (C1) performed higher means on Total scores of Mathematical Cognitive Skills as compared to Low Socio-Economic Status Group (C3).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in High Academic Stress Group (A1).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Cognitive Skills in Mathematics as compared to their counterparts in Group of X graders with Average Academic Stress (A2).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Academic Stress Group (A3).
- Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- Mean of Total scores on Mathematical Cognitive Skills of X graders with Average Socio-Economic Status (C2) and that of those in High Academic Stress (A1) were not different.
- Average Socio-Economic Status group (C2) of X graders and that of Average Academic Stress (A2) achieved equal means of Total scores on Mathematical Cognitive Skills.
- Low Academic Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- High Academic Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- Average Academic Stress Group (A2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
Low Academic Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

X graders having High (A1) and Average (A2) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.

X graders having High (A1) and Low (A3) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.

X graders having Average (A2) and Low (A3) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.

Three Order Interaction:
- The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different means of Total scores on Mathematical Cognitive Skills for X graders.

5.3.1.2: Conclusions based on analyses on Skill of Knowing

Main Effects:
- X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Knowing.
- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores of Skill of Knowing.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Knowing.
  - The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.
  - The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.
- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores of Skill of Knowing.
Data Analysis And Results

❖ The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Average Socio-Economic Status.
❖ The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.
❖ The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.

Two Order Interactions:
• Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Knowing for X graders.
• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Knowing for X graders.
• Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Knowing for X graders.

Three Order Interaction:
• The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Knowing for X graders.

5.3.1.3: Conclusions based on analyses on Skill of Understanding

Main Effects:
• X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Understanding.
• X graders having High, Average and Low Educational Aspirations were significantly different on mean scores for Skill of Understanding.
❖ X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Understanding.
❖ The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Understanding than their counterparts with Low Educational Aspirations.
The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill for Understanding than their counterparts with Low Educational Aspirations.

- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores for Skill of Understanding.

- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Average Socio-Economic Status.

- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Low Socio-Economic Status.

- X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Understanding.

**Two Order Interactions:**

- Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Understanding for X graders.

- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Understanding for X graders.

- Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Understanding for X graders.

**Three Order Interaction:**

- The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Understanding for X graders.

**5.3.1.4: Conclusions based on analyses on Skill of Analysis**

**Main Effects:**

- X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Analysis.

- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores for Skill of Analysis.

- X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Analysis.
Data Analysis And Results

- The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Analysis than their counterparts with Low Educational Aspirations.
- X graders having Average and Low Educational Aspirations achieved equal mean scores on Skill of Analysis.
- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores for Skill of Analysis.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Average Socio-Economic Status.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Low Socio-Economic Status.
  - X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Analysis.

Two Order Interactions:
- Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Analysis for X graders.
- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Analysis for X graders.
- Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Analysis for X graders.

Three Order Interaction:
- The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Analysis for X graders.

5.3.1.5: Conclusions based on analyses on Skill of Applying

Main Effects:
- X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Applying.
- X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Applying.
• X graders having High, Average and Low Socio-Economic Status achieved equal mean scores on Skill of Applying.

**Two Order Interactions:**
- Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Applying for X graders.
- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Applying for X graders.
- Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Applying for X graders.

**Three Order Interaction:**
- The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Applying for X graders.

### 5.3.1.6: Conclusions based on analyses on Skill of Solving

**Main Effects:**
- X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Solving.
- X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Solving.
- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores on Skill of Solving.
  - X graders having High and Average Socio-Economic Status achieved equal mean scores on Skill of Solving.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.
  - The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.
Data Analysis And Results

Two Order Interactions:

• Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Solving for X graders.
• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Solving for X graders.
• Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Solving for X graders.

Three Order Interaction:

• The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Solving for X graders.

5.3.2: CONCLUSIONS BASED ON ANALYSES OF MATHEMATICAL COGNITIVE SKILLS (TOTAL SCORES) AND SCORES ON EACH OF THE INDIVIDUAL MATHEMATICAL COGNITIVE SKILLS IN RELATION TO SOCIAL STRESS, EDUCATIONAL ASPIRATIONS AND SOCIO-ECONOMIC STATUS

Major conclusions drawn from the analyses reported in Section II have been summarized below:

5.3.2.1: Conclusions based on analyses on Total Scores of Mathematical Cognitive Skills

Main Effects:

• X graders having High, Average and Low Social Stress were significantly different on means of Total scores for Mathematical Cognitive Skills.
  ❖ The mean achievement of X graders with High Social Stress was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Social Stress.
Data Analysis And Results

❖ X graders having High and Low Social Stress achieved equal means of Total Scores on Mathematical Cognitive Skills.
❖ The mean achievement of X graders with Low Social Stress (M=44.81) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Social Stress (M=40.80).

- X graders having High, Average and Low Educational Aspirations were significantly different on means of Total scores on Mathematical Cognitive Skills.
  ❖ X graders having High and Average Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills.
  ❖ The mean achievement of X graders with High Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.
  ❖ The mean achievement of X graders with Average Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.

- X graders having High, Average and Low Socio-Economic Status were significantly different on means of Total scores of Mathematical Cognitive Skills.
  ❖ The mean achievement of X graders with High Socio-Economic Status was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Average Socio-Economic Status.
  ❖ The mean achievement of X graders with High Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.
  ❖ The mean achievement of X graders with Average Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.

Two Order Interactions:
- The interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Total Scores of Mathematical Cognitive Skills for X graders.
Data Analysis And Results

- High Social Stress Group (A1) was higher on means of Total scores on Cognitive Skills in Mathematics as compared to their counterparts Group (A2) of Average Social Stress group.
- Mean of Total scores on Mathematical Cognitive Skills of X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different.
- High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal means of Total scores on Mathematical Cognitive Skills.
- High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal means of Total scores on Mathematical Cognitive Skills.
- High Social Stress Group (A1) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).
- Low Social Stress Group (A3) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).
- High Educational Aspirations Group (B1) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).
- Average Educational Aspirations Group (B2) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).
- Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal means of Total scores on Mathematical Cognitive Skills.
- Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal means of Total scores on Mathematical Cognitive Skills.
- Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal means of Total scores on Mathematical Cognitive Skills.
Low Social Stress Group (A3) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

X graders having High (B1) and Average (B2) Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills.

High Educational Aspirations Group (B1) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

Average Educational Aspirations Group (B2) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

The interaction effect of Educational Aspirations and Socio-Economic Status yielded significantly different means on Total Scores of Mathematical Cognitive Skills for X graders.

Mean of Total scores on Mathematical Cognitive Skills of X graders with High Educational Aspirations (B1) and that of those in Average Educational Aspirations (B2) were not different.

High Educational Aspirations Group (B1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts (Group B3) of Low Educational Aspirations group.

High Socio-Economic Status Group (C1) performed higher on means of Total scores of Mathematical Cognitive Skills as compared to High Educational Aspirations Group (B1).

High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

High Educational Aspirations Group (B1) achieved higher means on Total scores of Cognitive Skills in Mathematics as compared to their counterparts in Group of X graders with Low Socio-Economic Status (C3).

Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).
Data Analysis And Results

- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Educational Aspirations (B2).
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).
- Low Educational Aspirations group (B3) of X graders and that of Average Socio-Economic Status (C2) achieved equal on Mathematical Cognitive Skills.
- Low Educational Aspirations Group (B3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

- The interaction effect of Socio-Economic Status and Academic Stress yielded significantly different means on Total Scores of Mathematical Cognitive Skills of X graders.
- High Socio-Economic Status Group (C1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts Group (C2) of Average Socio-Economic Status group.
- High Socio-Economic Status Group (C1) performed higher on means of Total scores of Mathematical Cognitive Skills as compared to Low Socio-Economic Status Group (C3).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in High Social Stress Group (A1).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Group of X graders with Average Social Stress (A2).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Social Stress Group (A3).
- Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- Average Socio-Economic Status Group (C2) of X graders and that of Average Social Stress (A2) achieved equal means of Total scores on Mathematical Cognitive Skills.
- Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- Average Social Stress Group (A2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
Data Analysis And Results

- High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).
- X graders having High (A1) and Low (A3) Social Stress achieved equal means on Total scores of Mathematical Cognitive Skills.
- Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).

Three Order Interaction:
- The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different means of Total scores on Mathematical Cognitive Skills for X graders.

5.3.2.2: Conclusions based on analyses on Skill of Knowing

Main Effects:
- X graders having High, Average and Low Social Stress were significantly different on mean scores of Skill of Knowing.
  - The mean achievement of X graders with High Social Stress was higher on scores of Skill of Knowing than their counterparts with Average Social Stress.
  - X graders having High and Low Social Stress achieved equal mean scores on Skill of Knowing.
  - The mean achievement of X graders with Low Social Stress was higher on scores of Skill of Knowing than their counterparts with Average Social Stress.
- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores of Skill of Knowing.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Knowing.
  - The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.
The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.

X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores of Skill of Knowing.

- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Average Socio-Economic Status.
- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.
- The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.

Two Order Interactions:

- The interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Scores of Skill of Knowing for X graders.
  - High Social Stress Group (A1) was higher on mean scores of Skill of Knowing as compared to their counterparts Group (A2) of Average Social Stress group.
  - Mean on scores of Skill of Knowing of X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different.
  - High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Knowing.
  - High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Knowing.
  - High Social Stress Group (A1) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).
Data Analysis And Results

- Low Social Stress Group (A3) achieved higher means on scores of Skill of Knowing than their counterparts in Average Social Stress Group (A2).

- High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Knowing than their counterparts in Average Social Stress Group (A2).

- Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Knowing than their counterparts in Average Social Stress Group (A2).

- Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Knowing.

- Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Knowing.

- Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal means scores on Skill of Knowing.

- Low Social Stress Group (A3) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).

- X graders having High (B1) and Average (B2) Educational Aspirations achieved equal mean scores on Skill of Knowing.

- High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).

- Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).

- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Knowing for X graders.

- Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Knowing for X graders.
Data Analysis And Results

Three Order Interaction:

- The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Knowing for X graders.

5.3.2.3: Conclusions based on analyses on Skill of Understanding

Main Effects:

- X graders having High, Average and Low Social Stress were significantly different on mean scores of Skill of Understanding.
  - X graders having High and Average Social Stress achieved equal mean scores on Skill of Understanding.
  - X graders having High and Low Social Stress achieved equal mean scores on Skill of Understanding.
  - The mean achievement of X graders with Low Social Stress was higher on scores of Skill of Understanding than their counterparts with Average Social Stress.

- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores of Skill of Understanding.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Understanding.
  - The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Understanding than their counterparts with Low Educational Aspirations.
  - The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill of Understanding than their counterparts with Low Educational Aspirations.

- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores of Skill of Understanding.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Average Socio-Economic Status.
Data Analysis And Results

- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Low Socio-Economic Status.
- X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Understanding.

Two Order Interactions:
- The interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Scores of Skill of Understanding for X graders.
- Mean scores on Skill of Understanding of X graders with High Social Stress (A1) and that of those in Average Social Stress (A2) were not different.
- Mean scores on Skill of Understanding of X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different.
- High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Understanding.
- High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Understanding.
- High Social Stress group (A1) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Understanding.
- Low Social Stress Group (A3) achieved higher means on scores of Skill of Understanding than their counterparts in Average Social Stress Group (A2).
- High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Understanding than their counterparts in Average Social Stress Group (A2).
- Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Understanding than their counterparts in Average Social Stress Group (A2).
Data Analysis And Results

❖ Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Understanding.
❖ Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Understanding.
❖ Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Understanding.
❖ Low Social Stress Group (A3) achieved higher means on scores of Skill of Understanding than their counterparts in Low Educational Aspirations Group (B3).
❖ X graders having High (B1) and Average (B2) Educational Aspirations achieved equal mean scores on Skill of Understanding.
❖ High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Understanding than their counterparts in Low Educational Aspirations Group (B3).
❖ Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Understanding than their counterparts in Low Educational Aspirations Group (B3).

• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Understanding for X graders.
• Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Understanding for X graders.

Three Order Interaction:
• The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Understanding for X graders.

5.3.2.4: Conclusions based on analyses on Skill of Analysis

Main Effects:
• X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Analysis.
**Data Analysis And Results**

- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores for Skill of Analysis.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Analysis.
  - The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Analysis than their counterparts with Low Educational Aspirations.
  - X graders having Average and Low Educational Aspirations achieved equal mean scores on Skill of Analysis.
- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores for Skill of Analysis.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Average Socio-Economic Status.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Low Socio-Economic Status.
  - X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Analysis.

**Two Order Interactions:**

- Social Stress and Educational Aspirations did not yield different mean scores on Skill of Analysis for X graders.
- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Analysis for X graders.
- Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Analysis for X graders.

**Three Order Interaction:**

- The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Analysis for X graders.
5.3.2.5: Conclusions based on analyses on Skill of Applying

Main Effects:
- X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Applying.
- X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Applying.
- X graders having High, Average and Low Socio-Economic Status achieved equal mean scores on Skill of Applying.

Two Order Interactions:
- Social Stress and Educational Aspirations did not yield different mean scores on Skill of Applying for X graders.
- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Applying for X graders.
- Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Applying for X graders.

Three Order Interaction:
- The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Applying for X graders.

5.3.2.6: Conclusions based on analyses on Skill of Solving

Main Effects:
- X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Solving.
- X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Solving.
- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores on Skill of Solving.
  - X graders having High and Average Socio-Economic Status achieved equal mean scores on Skill of Solving.
Data Analysis And Results

❖ The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.
❖ The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.

Two Order Interactions:
• Social Stress and Educational Aspirations did not yield different mean scores on Skill of Solving for X graders.
• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Solving for X graders.
• Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Solving for X graders.

Three Order Interaction:
• The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Solving for X graders.

SECTION IV

5.4: DISCUSSION OF RESULTS

5.4.1: Discussion of Results Related with Descriptive Analysis on Mathematical Cognitive Skills (Total Scores and Scores on each of the Individual Mathematical Cognitive Skills) In Relation To Academic Stress, Educational Aspirations and Socio-Economic Status

Both descriptive and inferential analyses were done on Mathematical Cognitive Skills (Total Scores and Scores on each of the individual Mathematical Cognitive Skills). The results revealed the differences in achievement scores of Mathematical Cognitive Skills (Total Scores and Scores on each of the individual Mathematical Cognitive Skills) in relation to Academic Stress, Educational
Aspirations and Socio-Economic Status. Corresponding hypotheses $H_{02}$, $H_{03}$, $H_{05}$, $H_{06}$, $H_{09}$, $H_{010}$, $H_{016}$, $H_{017}$, $H_{023}$, $H_{024}$ and $H_{038}$ were rejected.

Educational Aspirations was the main factor found to be associated with achievement scores of students. The findings of the present research work led to conclude that X graders having High, Average and Low Educational Aspirations were significantly different on Mathematical Cognitive Skills (Total Scores) and Scores on Skill of Knowing, Skill of Understanding and Skill of Analysis. The results of present study were found consistent with the findings of McCracken, Barcinas and Wimns (1991), Haas (1992), Singh and Gantes (1996), McCormick (1997), Rojewaski (1999), Meinster and Karen (2001), Marjoribanks (2003), Yun and Michal (2004), Howley (2006), Geraldine (2007) and Park (2008). Therefore $H_{02}$, $H_{09}$, $H_{016}$ and $H_{023}$ were rejected.

Differences in Parental Ambitions, Social Expectations, Peer Pressure, Culture, Social Value, Competition, Group Cohesiveness, Gender, and Socio-Economic Background may be the main factors for the rejection of these hypotheses. It may be mentioned that Parents always expect more and more from the first born and therefore the level of aspirations may be higher for first born than that of those born later. Society expects more and more from some people than others. It is generally assumed that one who is successful in a particular area may also be successful in other area if he wishes. Friends may encourage or discourage a child for anything. If they encourage him, it is possible that he will develop a tendency of high goal setting. Culture traditions are important factors for setting the goal better and rich cultural background helps the child in fulfilling high expectations. Social rewards and prestige also work as reinforcers. Competition with siblings and peers in the hope of showing better than others is also an affecting factor for level of aspirations. One dose better and sets high goals when he is acting in a group. It is generally found that boys have higher aspirations than girls because of their different interests, likings, goals and expectations of family and society. It is also noticed that groups with High and Average SES have higher degree of aspirations than those of lower groups.

Socio-Economic Status was another factor found to have association with achievement scores of students on various mathematical skills. The findings of
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present investigation led to a conclusion that X graders with High, Average and Low Socio-Economic Status were significantly different on Mathematical Cognitive Skills (Total scores) and scores on skill of Knowing, Skill of Understanding, Skill of Analysis and Skill of Solving. Therefore $H_{03}$, $H_{010}$, $H_{017}$, $H_{024}$ and $H_{038}$ were rejected. These results were found consistent with the findings of Frank & Winkleby (1992), Pappas & Fisher (1993) and Kennedy & Kawachi (2000).

Differences in Education of the parents and other family members, profession of parents and other family members, Income of the family from all sources, size of the family and total status of the family may be the main factors for the rejection of these hypotheses. It may be mentioned that Education plays a major role in skill sets for acquiring jobs, as well as specific qualities that stratify people with higher SES from lower SES. If the parents received advanced education, they are probably intelligent and therefore passed that on to their children. These parents are more likely to value education because of their experience in the efforts of higher education students whose parents don’t have advanced degree don’t have time or money to spend on helping their children advance to a higher level. Therefore, a cycle is created where in middle and lower classes generally stay in those classes. Lower socio-economic status can be a factor in poor health. Studies have shown mental health to be impaired due to the daily stress due to unemployment, economic displacement and housing dislocation, including homelessness. In addition, it is more difficult to provide healthy food, safe communities and clean work environments in areas of lower socio-economic status. On the flip side, those people with higher socio-economic status have more exposure to health care and information that promotes healthy behaviours. In today’s society, students of lower socio-economic background are generally lacking the technology needed to keep up with the general population. The obvious reason is the high price of technology. Studies have shown that by using computers and the internet in the classroom helps to equalize students of all socio-economic backgrounds. It allows students to be more involved academically and professionally in their futures. They may even become as technologically literate as their more economically advantaged peers. Socio-Economic Status strongly influences the varying student perspectives on the value and attainability of higher education. The probability of students attending schools of higher education is more
likely in students from higher socio-economic backgrounds. Education increase opportunities for income and job security. One’s level of education can also be an indicator of socio-economic status. Socio-Economic Status is based on income, but too often is connected to race as well.

The findings of the present investigation led to a conclusion that there was significant interaction effect of Educational Aspirations and Socio-Economic Status on the total scores of Mathematical Cognitive Skills of X graders. Therefore $H_6$ was rejected. It may be mentioned that Families with high socio-economic status often have more success in preparing their young children for school because they typically have access to a wide range of resources to promote and support young children’s development. Also, they have easy access to information regarding their children’s health, as well as social, emotional and cognitive development. In addition, families with high socio-economic status often seek out information to help them better prepare their young children for school.

Even in the families with above average incomes, parents often lack the time and energy to invest fully in their children’s preparation for school, and they sometimes face a limited array of options for high quality child care both before their children starts school and during the early school years. Kindergarten teachers throughout the country report that children are increasingly arriving at school inadequately prepared.

Families with low socio-economic status often lack of the financial, social and educational support that characterized families with high socio-economic status. Poor families also may have inadequate or limited access to community resources that promote and support children’s development and school readiness.

The findings of the present investigation led to a conclusion that there was significant interaction effect of Socio-Economic Status and Academic Stress on the total scores of Mathematical Cognitive Skills of X graders. Therefore $H_6$ was rejected. It may be mentioned that across all socioeconomic groups, parents face major challenges when it comes to providing optimal care and education for their children. For families in poverty, these challenges can be formidable. Sometimes, when basic necessities are lacking, parents must place top priority on housing, food,
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clothing, and health care. Educational toys, games, and books may appear to be luxuries, and parents may not have the time, energy, or knowledge to find innovative and less-expensive ways to foster young children's development. Even in families with above-average incomes, parents often lack the time and energy to invest fully in their children's preparation for school, and they sometimes face a limited array of options for high-quality child care--both before their children start school and during the early school years. Kindergarten teachers throughout the country report that children are increasingly arriving at school inadequately prepared.

Both descriptive and inferential analyses were done on Mathematical Cognitive Skills (Total Scores and Scores on each of the individual Mathematical Cognitive Skills). The results of this section revealed the differences in achievement scores of Mathematical Cognitive Skills (Total Scores and Scores on each of the individual Mathematical Cognitive Skills) in relation to Social Stress, Educational Aspirations and Socio-Economic Status. Corresponding hypotheses $H_043$, $H_044$, $H_045$, $H_046$, $H_047$, $H_048$, $H_050$, $H_051$, $H_052$, $H_053$, $H_057$, $H_058$, $H_059$, $H_060$, $H_065$, $H_066$ and $H_080$ were rejected.

Social Stress was the main factor found to have association with achievement scores of students. The findings of the present investigation led to a conclusion that X graders with High, Average and Low Social Stress were significantly different on Mathematical Cognitive Skills (Total Scores) and Scores on Skill of Knowing and Skill of Understanding. Therefore hypotheses $H_043$, $H_050$ and $H_057$ were rejected. These results were found consistent with the findings of Silva (1996) and Torsheim; Aaroe & Wold (2003).

Lack of family time, lack of support of teachers, friends and family, over-scheduling, not enough sleep, poor diet, noise pollution, lack of preparation may be the main factors for such results. Stressed out and negligent parents, high expectations in academic or other performances, abused or deprived childhood, growing up tensions and demand for familial responsibility may also be the main causes of childhood and teen social stress. Stressed children show signs of emotional disabilities, aggressive behavior, shyness, social phobia and often lack interest in otherwise enjoyable activities. Research tells us that children, who are forced to live...
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on prematurely adult levels, sometimes become oppositional to following the parents' rules (or those of society). Such children tend to respond to stressors with aggression and indignation. Many teenagers tend to become nonconformists and fall prey to teenage depression in response to a variety of growing up anxieties. However, stress induced fears and anxiety in children, adversely affect children's performances at various levels.

Educational Aspirations was another main factor found to be associated with achievement scores of students. The findings of the present research led to conclude that X graders having High, Average and Low Educational Aspirations were significantly different on Mathematical Cognitive Skills (Total Scores) and Scores on Skill of Knowing, Skill of Understanding and Skill of Analysis. The results of present study were found consistent with the findings of McCracken, Barcinas and Winns (1991), Haas (1992), Singh and Gantes (1996), McCormick (1997), Rojewaski (1999), Meinster and Karen (2001), Marjoribanks (2003), Yun and Michal (2004), Howley (2006), Geraldine (2007) and Park (2008). Therefore \( \text{H}_044, \text{H}_051, \text{H}_058 \) and \( \text{H}_065 \) were rejected.

Differences in Parental Ambitions, Social Expectations, Peer Pressure, Culture, Social Value, Competition, Group Cohesiveness, Gender, and Socio-Economic Background may be the main factors for the rejection of these hypotheses. Society expects more and more from some people than others. It is generally assumed that one who is successful in a particular area may also be successful in other area if he wishes. Friends may encourage or discourage a child for anything. Rich cultural background helps the child in fulfilling high expectations. Social rewards and prestige also works as reinforces. Competition with siblings and peers in the hope of showing better than others is also an affecting factor for level of aspirations. It is generally found that boys have higher aspirations than girls because of their different interests, likings, goals and expectations of family and society. It is also noticed that groups with High and Average SES have higher degree of aspirations than those of lower groups.

The findings of present investigation led to a conclusion that X graders with High, Average and Low Socio-Economic Status were significantly different on
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Mathematical Cognitive Skills (Total scores) and scores on skill of Knowing, Skill of Understanding, Skill of Analysis and Skill of Solving. Therefore $H_{045}, H_{052}, H_{059}, H_{066}$ and $H_{080}$ were rejected. These results were found consistent with the findings of Frank & Winkleby (1992), Pappas & Fisher (1993) and Kennedy & Kawachi (2000).

Differences in Education of the parents and other family members, profession of parents and other family members, Income of the family from all sources, size of the family and total status of the family may have caused such results. Studies have shown that by using computers and the internet in the classroom helps to equalize students of all socio-economic backgrounds. It allows students to be more involved academically and professionally in their futures. They may even become as technologically literate as their more economically advantaged peers. Socio-Economic Status strongly influences the varying student perspectives on the value and attainability of higher education. The probability of students attending schools of higher education is more likely in students from higher socio-economic backgrounds. Education increase opportunities for income and job security. One’s level of education can also be an indicator of socio-economic status. Socio-Economic Status is based on income, but too often is connected to race as well.

The findings of the present investigation led to a conclusion that there was significant interaction effect of Social Stress and Educational Aspirations on Mathematical Cognitive Skills (Total scores) and scores on skill of Knowing and Skill of Understanding. Therefore $H_{046}, H_{053}$ and $H_{060}$ were rejected. It may be mentioned that parents always expect more from their children. Parental Aspirations are always high for their children. But stressed out and negligent parents, high expectations in academic or other performances are the main causes for social stress. Society expects more and more from some people than others. It is generally assumed that one who is successful in a particular area may also be successful in other area if he wishes. Too much high expectations cause Social Stress. Rich culture background helps the child in fulfilling high expectations but poor cultural background causes social stress. Differences in Socio-Economic Status also cause social stress. Competition with siblings and peers in the hope of showing better than other is an
affecting factor for level of Aspirations. Social rewards and prestige works as reinforces.

The findings of the present investigation led to a conclusion that there was significant interaction effect of Educational Aspirations and Socio-Economic Status on the total scores of Mathematical Cognitive Skills of X graders. Therefore \( H_0^{47} \) was rejected. It may be mentioned that Families with high socio-economic status often have more success in preparing their young children for school because they typically have access to a wide range of resources to promote and support young children’s development. Also, they have easy access to information regarding their children’s health, as well as social, emotional and cognitive development. In addition, families with high socio-economic status often seek out information to help them better prepare their young children for school.

Even in the families with above average incomes, parents often lack the time and energy to invest fully in their children’s preparation for school, and they sometimes face a limited array of options for high quality child care both before their children starts school and during the early school years. Kindergarten teachers throughout the country report that children are increasingly arriving at school inadequately prepared.

Families with low socio-economic status often lack of the financial, social and educational support that characterized families with high socio-economic status. Poor families also may have inadequate or limited access to community resources that promote and support children’s development and school readiness.

The findings of the present investigation led to a conclusion that there was significant interaction effect of Socio-Economic Status and Academic Stress on the total scores of Mathematical Cognitive Skills of X graders. Therefore \( H_0^{48} \) was rejected. It may be mentioned that across all socioeconomic groups, parents face major challenges when it comes to providing optimal care and education for their children. For families in poverty, these challenges can be formidable. Sometimes, when basic necessities are lacking, parents must place top priority on housing, food, clothing, and health care. Educational toys, games, and books may appear to be luxuries, and parents may not have the time, energy, or knowledge to find innovative
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and less-expensive ways to foster young children's development. Even in families with above-average incomes, parents often lack the time and energy to invest fully in their children's preparation for school, and they sometimes face a limited array of options for high-quality child care--both before their children start school and during the early school years. Kindergarten teachers throughout the country report that children are increasingly arriving at school inadequately prepared.