CHAPTER - VI

SUMMARY AND CONCLUSIONS

For many social educators, citizenship has been accepted as the primary goal of social studies. It includes the disciplines such as economics, geography, political science, and sociology. Most social scientists have felt an urge to make their disciplines more scientific, an emphasis often interpreted as requiring strict neutrality regarding moral values. Nurtured in universities and often feeling the need to compete with the rapidly growing knowledge and prestige of the physical sciences, social scientists took pride in being objective and "value-free". With the exception of persons in schools and colleges of education, university professors have paid little attention to what goes on in elementary and secondary education. On those occasions when a committee or commission has been appointed to examine the social studies content of the school education the report not surprisingly states that coverage of the particular social studies under study is inaccurate and inadequate.

The focus of social studies should be on the preparation of students for reflective and effective political participation in their society – a society whose central commitment (is) to human dignity. In short, the social studies should be "education for rational citizenship". The social studies syllabus in the Karnataka State has been increasingly modified in recent years. Courses in economics, geography, political science and sociology have been offered as
electives in many secondary schools. In addition, the social studies syllabus has been modified to include courses, units, or emphases that reflect a great variety of social concerns – particularly racial and sexual equity. The increased inclusion of specific materials related to social concerns makes the school curriculum a little more like the university curriculum. Hence, there is an urgent need to make this discipline more scientific by exposing the field to research work.

SOI has been known to be a model useful for teaching reading and remedial work in classrooms. Considering the potential of this model for developing academic achievement in social studies, this study was undertaken to probe into the correlation between Memory abilities and academic achievement in Social Studies. Thus, the researcher intends to study the association of Guilford’s Memory abilities with academic achievement of secondary students in Social Studies.

6.1 Re-statement of the Problem

“Effectiveness of Guilford’s Memory Factors in Predicting Academic Achievement in Social Studies among Secondary School Students”.

6.2 Variables

6.2.1 Independent Variables

The following are the four independent variables based on the four content areas in Guilford’s Structure of Intellect model:
i. Memory of Figural Abilities
ii. Memory of Symbolic Abilities
iii. Memory of Semantic Abilities
iv. Memory of Behavioural Abilities

6.2.2 Dependent Variables
i. Academic Achievement in Social Studies

6.3 General Objectives
The present study was undertaken with the following general objectives in view.

1. To study the association of Memory of Figural abilities with Academic Achievement of students in Social Studies.

2. To study the association of Memory of Symbolic abilities with Academic Achievement of students in Social Studies.

3. To study the association of Memory of Semantic abilities with Academic Achievement of students in Social Studies.

4. To study the association of Memory of Behavioural abilities with academic achievement of students in Social Studies.

5. To study the association of Memory of four Content areas as a whole with academic achievement of students in Social Studies.

6. To compare the academic achievement of students in Social Studies with different levels of Memory abilities.

6.4 Specific Objectives
The general objectives of the study were restated in terms of Specific Objectives. The first general objective was restated in terms of Specific
Objectives 1 to 3, the second in terms of 4 to 6 Objectives, the third in terms of 7 to 9 Objectives, the fourth in terms of 10 to 12 Objectives, the fifth in terms of 13 to 15 Objectives, and the sixth in terms of 16 to 20 Objectives. The details are as follows:

i. To study the relationship of Memory of Figural abilities with academic achievement of students in Social Studies.

ii. To determine the relative efficiency of Memory of Figural abilities in predicting changes in academic achievement of students in Social Studies.

iii. To investigate the direct and indirect effects of Memory of Figural abilities on academic achievement of students in Social Studies.

iv. To study the relationship of Memory of Symbolic abilities with academic achievement of students in Social Studies.

v. To determine the relative efficiency of Memory of Symbolic abilities in predicting changes in academic achievement of students in Social Studies.

vi. To investigate the direct and indirect effects of Memory of Symbolic abilities on academic achievement of students in Social Studies.

vii. To study the relationship of Memory of Semantic abilities with academic achievement of students in Social Studies.

viii. To determine the relative efficiency of Memory of Semantic abilities in predicting changes in academic achievement of students in Social Studies.
ix. To investigate the direct and indirect effects of Memory of Semantic abilities on academic achievement of students in Social Studies.

x. To study the relationship of Memory of Behavioural abilities with academic achievement of students in Social Studies.

xi. To determine the relative efficiency of Memory of Behavioural abilities in predicting changes in academic achievement of students in Social Studies.

xii. To investigate the direct and indirect effects of Memory of Behavioural abilities on academic achievement of students in Social Studies.

xiii. To study the relationship of Memory of four content areas as a whole with academic achievement of students in Social Studies.

xiv. To determine the relative efficiency of Memory of four content areas as a whole in predicting changes in academic achievement of students in Social Studies.

xv. To investigate the direct and indirect effects of Memory of four content areas as a whole on academic achievement of students in Social Studies.

xvi. To compare the academic achievement of students in Social Studies with different levels of Memory of Figural abilities.

xvii. To compare the academic achievement of students in Social Studies with different levels of Memory of Symbolic abilities.
To compare the academic achievement of students in Social Studies with different levels of Memory of Semantic abilities.

To compare the academic achievement of students in Social Studies with different levels of Memory of Behavioural abilities.

To compare the academic achievement of students in Social Studies with different levels of Memory of four content areas as a whole.

6.5 Research Hypotheses

In pursuance of the above Specific Objectives, the following research hypotheses were set up:

1. There exists a significant relationship between Memory of Figural abilities and academic achievement of students in Social Studies.

2. There exists the joint direct and indirect effects of Memory of Figural abilities on academic achievement of students in Social Studies.

3. There exists a significant relationship between Memory of Symbolic abilities and academic achievement of students in Social Studies.

4. There exists the joint direct and indirect effects of Memory of Symbolic abilities on academic achievement of students in Social Studies.

5. There exists a significant relationship between Memory of Semantic abilities and academic achievement of students in Social Studies.
6. There exists the joint direct and indirect effects of Memory of Semantic abilities on academic achievement of students in Social Studies.

7. There exists a significant relationship between Memory of Behavioural abilities and academic achievement of students in Social Studies.

8. There exists the joint direct and indirect effects of Memory of Behavioural abilities on academic achievement of students in Social Studies.

9. There exists a significant relationship between Memory of four Content areas as a whole and academic achievement of students in Social Studies.

10. There exists the joint direct and indirect effects of Memory of four Content areas as a whole on academic achievement of students in Social studies.

11. There is a significant difference between different levels of Figural abilities and academic achievement of students in Social Studies.

12. There is a significant difference between different levels of Symbolic abilities and academic achievement of students in Social Studies.

13. There is a significant difference between different levels of Semantic abilities and academic achievement of students in Social Studies.

14. There is a significant difference between different levels of Behavioural abilities and academic achievement of students in Social Studies.
15. There is a significant difference between different levels of four Content areas as a whole and academic achievement of students in Social Studies.

6.6 Scope of the Study

i. The present study was limited to students studying in VIII Standard.

ii. The study was further restricted to academic achievement of students in Social Studies.

iii. Academic achievement in Social Studies was influenced by various intellectual abilities as shown in Guilford’s SI model. However, the present study was limited only to Memory abilities with four content areas, viz., Figural, Symbolic, Semantic and Behavioural.

6.7 Method of Research

In the present study, an attempt has been made to examine the association of Guilford’s memory factors based on four content areas with academic achievement of students in Social Studies. Further, the study also focused on finding out the relative efficiency of memory factors in predicting the academic achievement in Social Studies. Lastly, the direct and indirect effects of memory abilities on academic achievement in Social Studies were also analyzed in the study. Thus, the study could be classified as descriptive and analytical study.
6.7.1 Tools Used

Since the available tests for the assessment of Guilford’s Memory factors based on four types of contents were not found to be that satisfactory in terms of comprehensiveness and relevance, it was decided to develop the tests covering all the 24 Memory abilities using the standard procedure.

The following tests were developed using scientific procedure in order to collect the data:

i. Development of Guilford’s Type Tests to measure Memory Factors / Abilities

ii. Construction of Academic Achievement Test in Social Studies

6.7.2 The Sample

In the selection of sample from VIII Standard the method of random sampling technique was used. About 300 students studying 10 high schools belonging to Dharwad district constituted the sample for the study. The sample involved 150 boys and 150 girls.

6.7.3 Collection of Data

In order to collect the essential data for the purpose of analysis, the investigator used the Guilford’s Type Test on Memory Abilities, viz., Figural, Symbolic, Semantic and Behavioural. The tests were administered by the investigator personally in all the ten high schools with a view to control class teachers’ influence on the test performance. The testing was done in a normal classroom situation and during normal school hours only. The students were properly given instructions regarding the time allotted to each test and the
marking procedure. The proper care was taken with regard to the seating arrangement, size of the class, ventilation, etc. The investigator collected the response sheets personally after administering the tests.

6.7.4 Statistical Techniques

In pursuance of the Specific Objectives – 1, 4, 7, 10 and 13, to study the relationship between Memory abilities and Academic Achievement in Social Studies, the Pearson’s Product–Moment Coefficient of Correlation technique was used. In pursuance of the Specific Objectives – 2, 5, 8, 11 and 14, to determine the relative efficiency of Memory abilities based on four content areas in predicting Academic Achievement in Social Studies, the Multiple Regression Analysis (normal) was used with the different independent variables fitted into a Regression equation. In pursuance of the Specific Objectives – 3, 6, 9, 12, and 15, to examine the direct and indirect effects of Memory abilities in Academic Achievement in Social Studies, the Path Analysis was used. In pursuance of the Specific Objectives–16 to 20, One-way Analysis of Variance was used with a view to find out the variations in academic achievement scores in Social Studies when analyzed in terms of different levels of Memory abilities.

6.8 Major Findings

Section – I: Memory of Figural Abilities

1. The Memory abilities/factors like Figural – Units (MFU), Classes (MFC), Relations (MFR), Systems (MFS), Transformations (MFT) and Implications (MFI) are having
positive and significant relationship with the academic achievement of students in Social Studies.

2. The potency of MFU, MFC, MFR, MFS, MPT and MFI taken together in the prediction of academic achievement of students in Social Studies, MPT makes the maximum contribution, and MFI, MFU and MFS makes considerable contribution for prediction.

3. The Memory of Figural Units (MFU) has direct positive and significant effect on academic achievement of students in Social Studies. But its indirect positive and significant effect on academic achievement of students in Social Studies is through MFC, MFR and MFI. However, its indirect negative and significant effect is through MPT.

4. The Memory of Figural Classes (MFC) has direct positive and significant effect on academic achievement of students in Social Studies. But its indirect positive and significant effects on academic achievement of students in Social Studies is through MFU, MFR, MPT and MFI.

5. The Memory of Figural Relations (MFR) has no direct positive and significant effect on academic achievement of students in Social Studies. But its indirect positive and significant effects on academic achievement of students in Social Studies is through MFU, MFC and MPT. However, its indirect negative and significant effect is through MFI.

6. The Memory of Figural Systems (MFS) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MFI.
7. The Memory of Figural Transformations (MFT) has direct positive and significant effect on academic achievement of students in Social Studies. But its indirect positive and significant effects on academic achievement of students in Social Studies is through MFC, MFR and MFI. However, its indirect negative and significant effect is through MFU.

8. The Memory of Figural Implications (MFI) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MFU, MFC, MFS and MFT. However, its indirect negative and significant effect is through MFR.

Section – II : Memory of Symbolic Abilities

1. The Memory abilities/factors like Symbolic Units (MSU), Classes (MSC), Relations (MSR), Systems (MSS), Transformations (MST) and Implications (MSI) are having positive and significant relationship with the academic achievement of students in Social Studies.

2. The potency of MSU, MSC, MSR, MSS, MST and MSI, taken together in the prediction of academic achievement of students in Social Studies, MSC makes the maximum contribution, and MSS makes considerable contribution for prediction.

3. The Memory of Symbolic Units (MSU) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MSS and MST. However, its indirect negative and significant effect is through MSR.
4. The Memory of Symbolic Classes (MSC) has direct positive and significant effect on academic achievement of students in Social Studies at secondary level. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MSR, MSS, MST and MSI.

5. The Memory of Symbolic Relations (MSR) has direct positive and significant effect on academic achievement of students in Social Studies. But its indirect positive and significant effects on academic achievement of students in Social Studies is through MSU, MSC, MSR and MSI.

6. The Memory of Symbolic Systems (MSS) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MSU, MSC, MSR and MSI.

7. The Memory of Symbolic Transformations (MST) has no direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MSU and MSC.

8. The Memory of Symbolic Implications (MSI) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MSC, MSR and MSS.

Section – III : Memory of Semantic Abilities

1. The Memory abilities/factors like Semantic – Units (MMU), Classes (MMC), Relations (MMR), Systems (MMS), Transformations (MMT) and Implications (MMI) are having
positive relationship with the academic achievement of students in Social Studies. These factors will act as catalysts to improve the students performance in Social Studies.

2. The potency of MMU, MMC, MMR, MMS, MMT and MMI, taken together in the prediction of academic achievement of students in Social Studies, MMI makes the maximum contribution and MMR and MMT makes considerable contribution for prediction.

3. The Memory of Semantic Units (MMU) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MMC, MMR, MMS and MMI.

4. The Memory of Semantic Classes (MMC) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MMU and MMT.

5. The Memory of Semantic Relations (MMR) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MMU and MMT.

6. The Memory of Semantic Systems (MMS) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MMU and MMI.
7. The Memory of Semantic Transformations (MMT) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MMC, MMR and MMI.

8. The Memory of Semantic Implications (MMI) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MMU, MMS and MMT.

Section IV: Memory of Behavioural Abilities

1. The Memory abilities/factors like Behavioral - Units (MBU), Classes (MBC), Relations (MBR), Systems (MBS), Transformations (MBT) and Implications (MBI) are having positive relationship with the academic achievement of students in Social Studies. This implies that these factors are responsible for improving the performance of students in Social Studies.

2. The potency of MBU, MBC, MBR, MBS, MBT and MBI taken together in the prediction of academic achievement of students in Social Studies at secondary level, MBC makes the maximum contribution, and MBR and MBS makes considerable contribution for prediction.

3. The Memory of Behavioural Units (MBU) has no direct positive and significant effect on academic achievement of students in Social Studies. But its indirect positive and significant effects on academic achievement of students in Social Studies is through MBC, MBR, MBS, MBT and MBI.
4. The Memory of Behavioural Classes (MBC) has direct positive and significant effect on academic achievement of students in Social Studies. Further its indirect positive and significant effects on academic achievement of students in Social Studies is through MBU, MBR, MBT and MBI.

5. The Memory of Behavioural Relations (MBR) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MBU, MBC, MBS and MBT.

6. The Memory of Behavioural Systems (MBS) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MBU, MBR and MBT.

7. The Memory of Behavioural Transformations (MBT) has no direct positive and significant effect on academic achievement of students in Social Studies. But its indirect positive and significant effects on academic achievement of students in Social Studies is through MBU, MBC, MBR, MBS and MBI.

8. The Memory of Behavioural Implications (MBI) has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MBU, MBC and MBC.

Section – V: Memory of Four Content Areas as a Whole

1. The Memory of Figural Abilities (MFA), Memory of Symbolic Abilities (MSA), Memory of Semantic Abilities (MMA) and
Memory of Behavioural Abilities (MBA) as a whole are having positive and significant relationship with the academic achievement of students in Social Studies. These factors will strengthen the academic performance of the students in Social Studies.

2. The potency of MFA, MSA, MMA and MBA as a whole in the prediction of academic achievement of students in Social Studies at secondary level, MSA makes the maximum contribution, and MBA and MFA makes considerable contribution for prediction.

3. The Memory of Figural abilities/factors as a whole has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MSA, MMA and MBA.

4. The Memory of Symbolic abilities/factors as a whole has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MFA, MMA and MBA.

5. The Memory of Semantic abilities/factors as a whole has direct positive and significant effect on academic achievement of students in Social Studies. Further, its indirect positive and significant effects on academic achievement of students in Social Studies is through MFA, MSA and MBA.

6. The Memory of Behavioural abilities/ factors as a whole has direct positive and significant effect on academic achievement of students in Social Studies. But its indirect
positive and significant effects on academic achievement of students in Social Studies is through MFA, MSA and MMA.

Section - VI: Differential Analysis

Figural Abilities

1. The secondary school students with different Memory of Figural abilities do not vary in their academic achievement in Social Studies.

Symbolic Abilities

1. Students who are Above Average and Below Average; and Above Average and Average in memory of symbolic abilities differ each other in their Academic Achievement in Social Studies.

2. The largest difference is in between the means of Above Average (32.5900) and Average (38.8750) groups.

3. The smallest difference is in between the means of Average (38.8750) and Below Average (38.2400) groups.

4. The mean value 38.2400 between Above Average in Memory of Symbolic Abilities and Below Average in Academic Achievement clearly indicates that these two groups differ significantly. The mean value 38.8750 between Above Average in Memory of Symbolic Abilities and Average in Academic Achievement reveals that the difference between the groups is significant. Further, it is concluded that students with different memory of symbolic abilities vary in their Academic Achievement in Social Studies.
Semantic Abilities

1. The secondary school students with varying Memory of Semantic abilities do not differ in their academic achievement in Social Studies.

Behavioural Abilities

1. Students who are Average and Below Average; Above Average and Below Average in memory of behavioural abilities differ each other in their Academic Achievement in Social Studies. But there is no significant difference between Above Average and Average groups in their Academic Achievement in Social Studies.

2. The largest difference is in between the means of Average (32.0000) and Below Average (37.4380) groups.

3. The smallest difference is in between the means of Above Average (34.2730) and Average (32.0000) groups.

4. The mean value 37.4380 between Above Average in Memory of Behavioural Abilities and Below Average in Academic Achievement clearly indicates that these two groups differ significantly. Further, the same mean value between Above Average in Behavioural Abilities and Below Average in Academic Achievement indicates that there is difference in these two groups also. Further, the secondary school students with varying degrees of Memory of Behavioural abilities differ in their Academic Achievement in Social Studies.

Memory Abilities as a Whole

1. The secondary school students with different Memory abilities based on four contents as a whole do not vary in their Academic Achievement in Social Studies.
6.9 Discussion and Conclusions

6.9.1 Discussion

1. Figural Abilities

From the results obtained in the present study it is found that there is a positive and significant correlation of the factors MFU, MFC, MFR, MFS, MFT and MFI with academic achievement in Social Studies. It indicates that these memory factors are closely associated with academic achievement of students in Social Studies. The attainment of these memory factors results in enhancing academic achievement of students in Social Studies. The results obtained by other investigators, viz., Ball (1972), Tucker (1974), D'Errico, Albert Pusquale (1976), Komn, Richard Arnold (1978) and Bajtelsmit, Jhon Wernher (1978) are in line with the findings of the present study.

Some of the Indian studies, viz., Acharyalu (1978), Gupta (1978), Sharma (1982), Singh (1983), Rajeshwari (1988), Venugopal (1994) showed that there is a positive and significant relationship between Figural abilities and academic achievement. The results of all these studies support the findings of the present study.

Further, in the present study it is found that the prediction power of factors MFU, MFC, MFR, MFS, MFT and MFI is not significant. Relative contributions of these factors to academic achievement of Social Studies are relatively negligible (less than 10 %). This shows that the students studying at the secondary school level are lacking in the MFU, MFC, MFR, MFS, MFT and MFI abilities. This may be due to the lack of presentation of Social Studies
content through Figural mode in secondary schools. It implies that there is a need to promote these factors among secondary school students to improve their performance in Social Studies. Gupta (1978) found that visual mode of presentation was found to be significantly better for retention than auditory mode of presentation. This finding is in line with the above discussion.

The direct effect of MFU, MFC, MFS, MFT and MFI on academic achievement of students in Social Studies is significant. In addition to this, their indirect effects through other factors is also significant. This shows that the memory of figural products like Units, Classes, Systems, Transformations and Implications have direct bearing on the academic achievement of students in Social Studies.

The comparison of academic achievement of students in Social Studies with different levels of Figural ability shows that the three groups do not differ significantly. This implies that the difference in the Figural ability do not result in difference of achievement in Social Studies. Therefore, it is concluded that the academic achievement in Social Studies is irrespective of the memory of figural abilities of students.

As almost all the studies conducted in India and abroad support directly or indirectly the finding of the present study, the outcome of the study may be accepted at a large scale.
2. Symbolic Abilities

The present study revealed that there is a positive and significant correlation between symbolic abilities in Memory operation and academic achievement of students in Social Studies. The attainment of these factors in the classroom will enhance the academic achievement of students in Social Studies. The results obtained by other investigators, viz., Tucker (1974); Komm, Richard Arnold (1978) and Bajtelsmit, Jhon Wernher (1978) are in line with the finding of the present study.

Some of the Indian studies, viz., Gupta (1978), Chouhan (1980), Sharma (1982), Singh (1983), Rajeshwari (1988), Venugopal (1994), Martha Pujar (2001), Shetti (2003) showed that there is a positive and significant relationship between attainment of Symbolic abilities and academic achievement. The results of all these studies are in agreement with the finding of the present study.

Further, in the present study it is found that out of six Memory of Symbolic abilities, prediction power of MSU, MSR, MST and MSI is not considerable. Relative contributions of these factors to academic achievement in Social Studies is relatively negligible. When compared to MSC and MSS, the contribution of MST to academic achievement in Social Studies is less (− 2%). So, the factor MST is not a best predictor of academic achievement of students in Social Studies. This shows that the students at the secondary school are lacking in the MST ability. The reason may be due to the lack of opportunities among students to apply their social concepts and principles taught in
secondary schools. From this, it is concluded that there is a need to promote MST factor among secondary school students to facilitate Social Studies learning.

With regard to direct and indirect effects of Memory of Symbolic factors on academic achievement in Social Studies, MST has no significant direct effect on academic achievement in Social Studies. However, its indirect influence through other factors is significant. Although the factors like MSU, MSC, MSS, MST and MSI are having direct effects on academic achievement in Social Studies, the factor MST is not influencing on the academic achievement in Social Studies directly. This implies that the products like Units, Classes, Systems, Transformations and Implications in the Memory of Symbolic abilities have direct bearings on the academic achievement of students in Social Studies.

Students who are Above Average, Average and Below Average in their Memory of Symbolic abilities differ in their academic achievement in Social Studies. This shows that the difference in the Symbolic ability scores is responsible for bringing variation in performance in Social Studies. Thus, a close association exists between Symbolic abilities and achievement in Social Studies.

As almost all the studies conducted in India and abroad support directly or indirectly the finding of the present study, the outcome of the study may be accepted widely.
3. Semantic Abilities

From the results obtained in the present study, it is clearly revealed that the factors MMU, MMC, MMR, MMS, MMT and MMI are closely associated with academic achievement in Social Studies. This shows that variation in the academic achievement in Social Studies depends on the manifestation of these abilities among students. The study by Williams (1969), revealed that boys with I.Q. over 120 showed a greater strength in ‘Memory’ and the ‘Semantic’ dimensions throughout the Structure of Intellect profile than those with I.Q. below 120. This finding supported the results of the present study. The other studies, viz., Fedman (1970), Tucker (1974), Komn, Richard Arnold (1978) and Bajtelsmit, John Wernher (1978) found that Semantic abilities have significant relationships with academic achievement.

Some of the Indian studies, viz., Gupta (1978), Acharyalu (1978), Sharma (1982), Singh (1983), Tiwari (1986), Rajeshwari (1988), Venugopal (1994), Martha Pujar (2001) and Shetti (2003) showed that the coefficient of correlation between Semantic abilities and academic achievement is positive and significant. Thus, the results of all these studies are in conjunction with the finding of the present study.

Further, out of six Memory of Semantic abilities, the prediction power of MMU, MMC, and MMS abilities is low. Relative contributions of these factors to academic achievement in Social Studies is relatively negligible. When compared to MMR, MMT and MMI abilities, the contributions of MMU, MMC and MMS abilities to academic achievement in Social Studies is not at all
considerable (less than 5%). So, the factors like MMU, MMC and MMS are not a best predictors of academic achievement in Social Studies. This shows that the students at the secondary school have not developed the abilities such as MMU, MMC and MMS. This shows that there is a need to promote these factors among secondary school students to facilitate learning in Social Studies.

The factors MMU, MMC, MMR, MMS, MMT and MMI have direct effect on academic achievement in Social Studies. These factors be given importance in framing the syllabus. The indirect effect of these factors on academic achievement in Social Studies is also significant. It implies that academic achievement in Social Studies to a greater extent depend on Memory of Semantic abilities.

The comparison of three levels of Memory of Semantic abilities with respect to their achievement in Social Studies revealed that the students who are Above Average, Average and Below Average differ significantly. This indicates that the change in performance of students in Social Studies depends upon the Memory of Semantic abilities.

The studies conducted in India and abroad support directly or indirectly the finding of the present study, hence the out come of the study may be accepted.
4. Behavioural Abilities

The study revealed that the Memory of Behavioural Units, Classes, Relations, Systems, Transformations and Implications are having positive and significant relationship with the academic achievement of students in Social Studies. This shows that attainment of these Behavioural abilities will help in improving the academic performance of students in Social Studies. The results obtained in the studies, viz., Tucker (1974), Komn, Richard Arnold (1978) and Bajtelsmit, John Wernher (1978) are in line with the findings of the present study.


Since there are no studies directly conducted on Memory of Behavioural abilities so far, the outcome of this study may be accepted till further investigation.

Out of the six Memory of Behavioural abilities, MBT is proved to be a poor predictor of academic achievement in Social Studies. The relative contribution of this factor is 0.8114, which is less than 1 per cent. This shows that the students at the secondary school are poor in the ability of MBT. This further implies that teachers have failed to correlate the social facts with human behaviour in their daily work. Hence, there is a need to promote this factor among secondary school students to create interest in learning social concepts.
From the results obtained in the present study, it is found that there is no direct effect of factors like MBU and MBT on academic achievement in Social Studies. This indicates that the students have not developed these two abilities. However, their indirect influence through other factors is significant. This shows that the products like Memory of Behavioural Classes, Relations, Systems and Implications have direct influence on the academic achievement of students in Social Studies.

It is revealed from the study that the students who are Above Average, Average and Below Average in their Memory of Behavioural abilities do not differ in their academic achievement in Social Studies. This implies that although students differ in their Memory of Behavioural abilities, their performance in Social Studies is same.

The outcome of the study may be accepted since almost all the studies conducted in India and abroad will directly or indirectly concur with the finding of the present study.

5. **Total Memory Abilities**

Memory of Figural abilities, Symbolic abilities, Semantic abilities and Behavioural abilities as a whole shows that they have a positive and significant relationship with achievement of students in Social Studies. The attainment of these factors enhances academic achievement in Social Studies. The results obtained by other investigators, viz., Tucker (1974), found that there is significant and high correlation between the Structure of Intellect.
dimension scores and performance. Komn, Richard Arnold (1978) and Bajtelsmit, John Wernher (1978) are in line with the findings of the present study.

Some of the Indian studies, viz., Sharma (1982), found that the high achievers of only the scientific stream where significantly better than the low achievers on both verbal and non-verbal intelligence. Studies by Singh (1983), Rajeshwari (1988), revealed that the pupils of higher grades were found to score higher than those of lower grades. Venugopal (1994), Martha Pujar (2001) showed that there is a positive and significant relationship between Memory abilities and academic achievement. The results of all these studies support the findings of the present study.

The finding clearly reveals that all the Memory abilities except the Symbolic abilities were proved to be the best predictors of academic achievement in Social Studies. Since the finding of the study is in concurrence with the findings of the study available in the field, the outcome of the present study may be accepted.

The relative contributions of Memory of Figural abilities, Memory of Symbolic abilities and Memory Semantic abilities as a whole accounts for maximum 21.1216 per cent of variance in achievement in Social Studies when compared to the other potential predictors of criterion variable. It implies that the contents like Figural, Symbolic, Semantic have positive impact on achievement in Social Studies. This also further implies that the students of the secondary school are poor in Memory of Behavioural abilities. This may
be due to the lack of presentation of social content through Behavioural mode in secondary schools. Hence, there is a need to promote Memory of Behavioural abilities among secondary school students to create interest in learning Social Studies.

The direct effects of Figural abilities, Symbolic abilities, Semantic abilities are significant. However, indirect effect of these abilities through their corresponding memory abilities is significant.

6.9.2 Conclusions

Based on the discussion of findings of the study the following conclusions could be drawn:

1. The Memory of Figural factors –
   a) have positive and significant correlations with academic achievement of students in Social Studies;
   b) MFT seems to be the best predictor of all the predictor variables. The next best predictors of academic achievement in Social Studies in the order of priority are MFI, MFU, MFS, MFC and MFR;
   c) accounts for 13.8883 per cent of contributions to academic achievement in Social Studies;
   d) have direct significant effects on academic achievement in Social Studies except the factor MFR; and
   e) the scores of academic achievement in Social Studies do not differ significantly among different levels (Above Average, Average, Below Average) of Figural abilities.
2. The Memory of Symbolic factors—

a) have positive and significant correlations with academic achievement of students in Social Studies;

b) MSC seems to be the best predictor of all the predictor variables. The next best predictors of academic achievement of students in Social Studies in the order of priority are MSS, MSR, MSI, MSU and MST;

c) accounts for 17.3658 per cent of contributions to academic achievement of students in Social Studies;

d) have direct significant effects on academic achievement of students in Social Studies except the factor MST; and

e) the scores of academic achievement in Social Studies differ significantly among different levels (Above Average, Average, Below Average) of Symbolic abilities.

3. The Memory of Semantic factors—

a) have positive and significant correlations with academic achievement of students in Social Studies;

b) MMI seems to be the best predictor of all the predictor variables. The next best predictors of academic achievement of students in Social Studies in the order of priority are MMR, MMT, MMS, MMU and MMC;

c) accounts for 29.5098 per cent of contributions to academic achievement of students in Social Studies;

d) have direct significant effects on academic achievement of students in Social Studies; and

e) with varying degrees of Semantic Abilities the 3 groups do not differ significantly in their academic achievement in Social Studies.
4. The Memory of Behavioural factors –

a) have positive and significant correlations with academic achievement of students in Social Studies;

b) MBC seems to be the best predictor of all the predictor variables. The next best predictors of academic achievement of students in Social Studies in the order of priority are MBR, MBS, MBI, MBU and MBT;

c) accounts for 22.036 per cent of contributions to academic achievement of students in Social Studies;

d) have direct significant effects on academic achievement in Social Studies except the factors MBU and MBT; and

e) with varying degrees of Behavioural abilities students differ in their academic achievement in Social Studies.

5. The Memory of Figural, Symbolic, Semantic and Behavioural factors as a whole –

a) have positive and significant correlations with academic achievement of students in Social Studies;

b) Memory of Symbolic Abilities (MSA) seems to be the best predictor of all the predictor variables. The next best predictors of academic achievement of students in Social Studies in the order of priority are MBA, MFA and MMA;

c) accounts for 21.1216 per cent contributions to academic achievement of students in Social Studies; and

d) have direct significant effects on academic achievement of students in Social Studies;
e) the scores of academic achievement in Social Studies do not differ significantly among different levels (Above Average, Average, Below Average) of Memory of Figural, Symbolic, Semantic and Behavioural abilities as a whole.

6.10 Educational Implications

When Memory for discrimination of Figural Units (MFU) (is the ability to remember given figural objects) is found to represent a disability, this student will often have difficulty in learning word attack skills, phonics, and other rudiments of reading. Task practice will establish a longer span and accuracy of reproduction. Use of the Language Master is suggested. It allows the child to see the card with the stimulus figure on it, hear it, and at the same time hold the task in mind while he goes to a blackboard to reproduce it. Thus, three sensory modes are practiced. The length of time between hearing and seeing the figure can be extended for the student by counting so many seconds before reproducing the figure on the board, on paper, or in another room. The task can be expanded to include phonics, letters, numerals (Symbols – MSU), as well as words and phrases later on (seMantics – MMU).

Hiding objects or pictures of objects is also another game-like task which can be employed to build this ability. The well-known shell game (a small object under a walnut shell) is a similar activity. In most instances, this simple ability must be trained on an individual or small group basis.

The Position Memory factor test (Recall the position of a number-word pair approximately four hours after the initial administration of the Number-word test.) description will serve as a model for imposing an additional
requirement on any material used. For example, given seatwork to take home, the child may not only have to answer questions about the seatwork, but the next day, after the work is turned in, he may be asked to indicate where a certain item was on the paper he took home.

This is exactly the task required in chemistry for learning the positions of elements. The visual-minded student will have an easier time recalling the elements than will the auditory or motor learner; nevertheless, tasks pointed toward training visual position memory as exercised above may facilitate this ability for students who are not inclined towards visual memory.

Teaching for Figural Systems (MFS-A) (is the ability to remember auditory complexes of rhythm or melody) on an auditory input is not necessarily related to music, although music offers a rich source of ideas. Rattles of different pitches and sounds, weights and surfaces which vary in texture, all offer avenues of kinesthetic figural training. The class can, as a group, listen to rhythms of well-known songs and try to identify them. They, or the teachers, can use either their feet or hands to tap out familiar rhythms. Lengths of sounds (whole note, half notes) can be taught and practiced with instruments or voice tones; students can be asked to recall the order of presentation for repetition. A program for teaching piano and music to blind children was developed by Lenore McGuire whose approach depends on and trains MFS.

For instance, Memory of Symbolic Units (MSU) (is the ability to remember isolated items of symbolic information, such as syllables and words)
can be taught quite readily with the material at hand in math workbooks or spelling books by the teacher's suggesting that the child turn the book over and recall how many of something were there on the page. As the factor tests above indicate, the page should be studied for a given amount of time with the task in mind. Pictures cut from magazines which contain numerals can be used for study and recall by small groups and by the whole class. Students can cut and paste their own memory pictures using stimuli taken from required subject matter; for example: "How many 2's were there on the page?" "How many a's were there?" Given a page of numerals or letters, "circle (point to or write which numerals or letters) you see on this page which were on the page you just studied."

Older students may be equally in need of similar exercising. It should be emphasized that it is not the content of the material that is important so much as it is the task required; i.e., memory.

Before expecting students to be able to carry out tasks of MSC nature, the teacher should spend some time in teaching the concept of classification. Both the concept and the vocabulary he/she uses may be confusing to the child until each has been explained and examples given. Those students who have no difficulty with the concept can be helpful as partners for those who do have difficulty, and students who show no comprehension of the concept at all will, of course, need individual help.

The concept of classification is an important one (is the ability to remember symbolic class properties) and is one which is almost foundational.
to much of the subject matter the child is expected to learn. The Factor Test (is the ability to remember definitive connections between units of symbolic information) descriptions may be used as models. Perhaps more simple tasks will involve the children’s imposing their own classification systems on numerals and letters at hand, first, and then using these as study pages.

We all know how much difficulty some of us have in recalling names of people we have met. And even though we, as adults, can smile at our own human failing, we may not, nevertheless, appreciate that for the child who does not have the confidence which comes with knowing about universal human failings, the inability to remember is often so frightening that it threatens the establishing of a good academic self-concept. Children need to be taught relations first; they need to have time in school to study what they have learned; and then, they need to be given time for recall with additional time to check their corrections.

Each Factor Test description can serve as a model for various kind of activities to develop for children. Practice and mnemonic cues need to be given specifically and even intensely to develop this ability. A suggested time allotment for younger children is: ten minutes to go over and discuss the relationships, ten minutes to study them, a break for recess, ten minutes to reproduce the studied relationships, and five minutes to check their results. Each child can keep his own score, so that he/she is competing with his own memory span to increase it. Understanding one’s progress and making a graph of one’s own scores are good evaluation techniques. Here the student
learns to graph data while his competition is with himself and his rewards are immediately self-evident.

Descriptions of the Factor Tests (is the ability to remember the order of symbolic information) will serve as models in which phonetics, arithmetic combinations, and misspelled words are used. Students need training in MSS ability if their spans are short. A general weakness in immediate auditory memory span is often the cause of poor achievement in students with good IQs. Although backward span for numerals does factor separately from forward span for semantics, generalization often spreads to auditory stimuli. Thus, if the teacher depends heavily on vocal direction for tasks, his/her efforts in explaining may not be assimilated by those students with poor memory spans.

An individual exercise for those children suspected of having short memory spans is this: Digits should be presented vocally or visually on separate 3 x 5 cards on Language Master tape cards or slides. The latter is a basic exercise for speed reading and has had favourable results there as well as in Educationally Handicapped classes. The student need only to write down the span from memory after exposure. Twenty-minute periods, twice a week, of immediate memory training is recommended for students who show deficits in MSU, MSS, MMU and MMS.

A double purpose can be served by using exercises to train MST ability (is the ability to remember changes in symbolic information); memory is worked on, and at the same time, creativity is explored. The tests may come
out of the materials at hand for the class. If, for example, the study page holds sentences and directions stating "The name of what object is hidden in each of these sentences?" and the object always occurs as part of a compound word, the student will expect to underscore only the object in a compound word: "He made a snowball." Or combined beginnings and endings may be used: "Keep a tab all the time, or you might forget." Either version could be used to break sets of expectancies.

MMU ability (is the ability to remember isolated ideas or word meanings) may be strengthened by using exercises similar to those suggested for MSU and is easily adapted for primary grades. Pictures identical to those used in word charts and pre-primers are reinforcing for reading. These kinds of exercises are recommended as seatwork and as slides for all beginners and later for slower learners or students who need to drop down to a lower experimental level. As an adjunct to the task, students may be asked to search for and cut out pictures to go with words in their word box.

Test one in the non-language section of the California Test of Mental Maturity (CTMM) series tests MMC particular ability (is the ability to remember verbal or ideational class properties). It is a test of auditory memory for semantic classes, and even though scores on it may be penalizing to the student who is primarily a visual learner, or to the child who has poor auditory memory, it is, nevertheless, one of the few group tests which gives a measure of auditory memory for semantic classes.
Teachers can adapt materials for MMC ability from any course of study materials. What is important is that when the material is used for a memory task, it must be presented either visually (separately) or auditorially. Thus students will be given practice and training in both modal memory abilities.

Analogies and other relations (is the ability to remember meaningful connections between items of verbal information) should be presented as part of the course of study in English and Language Arts. So often, however, what happens is that the student is suddenly confronted with such items for the first time on a test. The simplest way to approach memory for relations between semantics is to give a page of analogies with all parts left in. The student studies them at school or home and then is given the test covering those specific analogies. His task later is to supply the missing part, which may occur any place in the structured analogy.

Again, visual as well as auditory exercises should be given to train this MMR ability.

Words in sentences can be read to students with key words given to them visually. The words are to be placed in correct order as previously read. This exercise can be performed visually, or vocally. The input can be visual with the output vocal, or the input can be given vocally with auditory reception and motoric output. The mode of input and output should be varied for the entire group and, of course, should be stressed according to individual needs for small groups when those needs have been identified.
If complexity is desired, sentences can be stretched into paragraphs. Children who have shown weaknesses on the Illinois Test of Psycholinguistic Abilities (ITPA) in Association and Sequencing will need tasks of this nature if their weaknesses are to be strengthened.

Spelling lists for the semester can be reorganized so that there is a pairing of homonyms and/or synonyms, which can be presented for study in the manner described by the Factor Tests.

Vocabulary can be treated in the same manner and taught as a separate part of the language arts program on a regular basis. Too often we depend on homework practice to develop memory; but, if we are to train for semantic transformation, the transformation of the original material ought to be more closely tied in time to the changed material. Such an approach makes the task one of short-term memory rather than one of long-term or stored, well-practiced memory. The debate continues between theorists on whether the former leads to or develops into the latter. For the teacher's purposes, a short-term approach is probably easier to administer and allows for more frequent evaluations of progress.

Imaginative use of subject matters can be attempted in much the same manner as explored by Hunt and Benoit. Training for implications requires teaching at an abstract, non-referent level, and it is expected that memory for previously taught implications will result. *Books and Authors* (Recall probable occupations for given fictitious persons after studying a page of name—book pairs) is a most promising model to follow as a guideline.
6.11 Suggestions for Further Research

While conducting the present study, a need for a few specific research studies relating to the field was felt. The suggestions for such studies are enumerated below under two categories: one studies that arise out of the limitations of the present investigation; and the other, studies that are related to the field.

Studies Arising out of the Limitations of the Present Investigation

1. Studies could be undertaken to develop valid, reliable and standardized tool for assessing Memory factors among secondary school students with norms for Indian children.

2. Development of Audio-Video computer programme for the assessment of Memory factors among primary school children may be taken up.

3. Studies may be conducted to investigate the relationship between Cattell’s 16 Personality Factors and scores of Memory factors.

4. Studies may be undertaken to investigate the relative contributions of the Content variables – Figural, Symbolic, Semantic and Behavioural contents to Memory ability.

5. Interaction studies could be undertaken involving different Operations – Cognition, Memory and Evaluation on academic achievement of students.

6. Studies may be conducted to investigate the relationship between scores of Memory factors and General Mental ability scores.
7. Studies exploring the association of Memory for discrimination of Figural, Symbolic, Semantic and Behavioural abilities with academic achievement in Language, Science and Mathematics may be undertaken.

8. Studies may be taken up to investigate the association of Cognition, Divergent Production, Convergent Production and Evaluation factors with academic achievement in Social Studies.

9. Studies may be conducted to cross-validate the findings of the present study.

*Studies Related to the Problem*

1. Comparative study could be undertaken to find out the attainment of Memory factors among students studying in Central Schools, Jawahar Navodaya Vidyalayas, Sainik Schools, Morarji Residential Schools and Private Schools.

2. Study may be undertaken to assess the Memory factors among Primary School children, Secondary School children and Pre-University students.

3. Studies could be undertaken to measure Memory factors among Secondary School students when they are classified according to age, sex, locality, educational qualifications, etc.

4. Study may be undertaken to investigate the relationship among the various Content areas – Figural, Symbolic, Semantic, and Behavioural.
5. Studies may be undertaken to design instructional strategies in order to develop Memory abilities among Primary and Secondary School students.

6. Longitudinal studies based on age-wise, educational background-wise and IQ-wise analysis of Memory factors could be undertaken among school children.

7. Studies may be undertaken to compare Memory factors among students of Engineering Colleges, Medical Colleges, Agricultural Colleges, Home Science Colleges and other Academic Colleges.

8. Studies could be undertaken to compare Memory factors among Arts, Science and Commerce graduates.