Chapter 15

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Introduction

Search for moderators that bridge the gap between high- and average-achievement as well as average- and low-achievement has persistently engaged the attention of researchers for over five decades. Particularly, the current global desire to stem the present tide of decline in the standard of education and to bring about improvement in school performance has increased the intensity with which attempts are being made to find out the key mediators. These mediators in the form of psychological factors of styles of learning, locus of control, achievement motivation, and intelligence need be assessed as they are likely to be differentially related to the different levels of discrepant academic achievement.

Moreover, in the recent time, India (a leading developing country of the World) has thrust upon herself, the important role of helping to foster rapid educational growth of other Third World countries. Huge expenditure is being incurred by the Government of India in this giant stride to bring about an improvement in the existing structure of higher education in these countries. In response to this gesture of international goodwill and cooperation, many foreign nationals, more especially, the
Africans are now enrolled in various Indian universities. In order to justify the huge resources being invested in this scheme, it is absolutely necessary to ensure that a maximum number of these foreign students derive maximum benefits from India's educational system.

Educators in India are now becoming curious and concerned about the varied achievement of foreign minority students. Some foreign students, on the average, achieve well above Indian students, while some achieve far below. There is abundant evidence of low achievement and low enrolment of foreign nationals in science and professional courses. Achievement problems of foreign students have at least three major sources. One is India's educational system. Another could be related to economics. The third is cultural, related to cultural differences and "secondary cultural discontinuity" (Jacob, & Jordan, cited in More, 1990, P.2) "If we are going to equalize the opportunities we provide, we must consider culture" (Bennett, 1986, P.4). This investigation related partly to the third source, that is, detailed discussion on application of learning styles to understanding cultural differences in the way students learn, and then its applicability to Indian and African learners.

The Present Study

The present study titled "Styles of Learning, Locus of Control, and Achievement Motivation of High-, Average-,
and Low-Achieving College Students at different levels of Intelligence was embarked upon with a view to deepening our understanding of certain new and emerging psychological correlates of academic achievement throughout the total range of achievement and ability, academic high-, average-, and low-achievement, that is, three levels of academic achievement spread through the entire range of ability as well as when it was divided into three levels (high, average, and low intelligence).

In this investigation, "high-achievers" were defined operationally as those individuals within the group of top 27% of the students (Kelley's Criterion) considered on the basis of their aggregate percentage scores, whereas "low-achievers" were defined as those individuals within the bottom 27% of the students considered on the basis of their aggregate percentage scores. Incidentally, the individuals within the middle 46% of the students, that is, the rest of the students not included in the above two categories were designated as the 'average-achievers'.

The study was pivoted around the framework of the following hypotheses:
1. Differentials would exist with regard to the styles of learning for the total group, high-, average-, and low-achievers.

2. Differentials would exist with regard to the locus of control for the total group, high-, average-, and low-achievers.

3. Differentials would exist with regard to the achievement motivation for the total group, high-, average-, and low-achievers.

4. Differentials would exist with regard to the IQ for the total group, high-, average-, and low-achievers.

5. Differentials would exist with regard to the styles of learning of Science and Arts Students belonging to high-, average-, and low-achieving groups.

6. Differentials would exist with regard to the locus of control of Science and Arts Students belonging to high-, average-, and low-achieving groups.

7. Differentials would exist with regard to the achievement motivation of Science and Arts Students belonging to high-, average-, and low-achieving groups.

8. Differentials would exist with regard to the IQ of
Science and Arts students belonging to high-, average-, and low-achieving groups.

9. Sex differentials would exist with regard to the academic achievement of students belonging to high-, average-, and low-achieving groups.

10. Sex differentials would exist with regard to the styles of learning of students belonging to high-, average-, and low-achieving groups.

11. Sex differentials would exist with regard to the locus control of students belonging to high-, average-, and low-achieving groups.

12. Sex differentials would exist with regard to the achievement motivation of students belonging to high-, average-, and low-achieving groups.

13. Sex differentials would exist with regard to the IQ of students belonging to high-, average-, and low-achieving groups.

14. Differentials would exist with regard to the styles of learning of Indian and African students belonging to high-, average-, and low-achieving groups.

15. Differentials would exist with regard to the locus of control of Indian and African students belonging to high-, average-, and low-achieving groups.

16. Differentials would exist with regard to the achievement motivation of Indian and African students belonging to high-, average-, and low-achieving groups.

17. Differentials would exist with regard to the IQ of Indian and African students belonging to high-, average-,
and low-achieving groups.

18. Significant mean differences would exist among high-, average-, and low-achievers when compared at the same level of intelligence in respect of styles of learning.

19. Significant mean differences would exist among high-, average-, and low-achievers when compared at the same level of intelligence in respect of locus of control.

20. Significant mean differences would exist among high-, average-, and low-achievers when compared at the same level of intelligence in respect of achievement motivation.

21. Significant mean differences would exist among high-, average-, and low-achievers when compared at different levels of intelligence in respect of styles of learning.

22. Significant mean differences would exist among high-, average-, and low-achievers when compared at different levels of intelligence in respect of locus of control.

23. Significant mean differences would exist among high-, average-, and low-achievers when compared at different levels of intelligence in respect of achievement motivation.

24. Certain styles of learning, locus of control achievement motivation, and intelligence which correlate significantly with academic achievement would be 'common' to (a) the total group, high-, average-, and low-achievers, or (b) at least two of these groups.
25. Certain learning styles correlates of academic achievement would be specific to the total group, high-,
average-, or low-achievers.

26. Significant variance towards academic achievement would be contributed by styles of learning,
locus of control, achievement motivation, and intelligence for the total sample, high-, average-, and low-achievers.

27. Styles of learning, locus of control, achievement motivation, and intelligence would contribute differentially
to the prediction of academic achievement of the total group, high-, average-, and low-achievers individually
within the group, and from group to group.

28. Certain psychological traits present in the various independent variables would combine in specific
connstellations to yield common factor or factors with academic achievement of the total group.

29. The constellation of all the psychological traits measured by the independent variables of the three
contrasting groups of discrepant academic achievement, i.e. high-, average-, and low-achievement would differ from each
other as well as from total group.

30. Certain learning style correlates of academic achievement would be 'common' to (a) the total group, Indian
and African samples, or at least two of the three groups.

31. Certain learning style correlates of academic achievement would be specific to the total group, Indian or
African samples.
Method and Procedure

In order to test the above-stated hypotheses, the study was designed and advanced through two phases. In the first phase, identification of high-, average-, and low-achievers as well as the high-, average-, and low-intelligence groups was made out of a sample of 735 college students who were selected on the basis of multi-staged randomization of clusters. Identification of high-, average-, and low-achievers was made with the help of Kelley's (1939) criterion by which top 27% and bottom 27% of the students, considered on the basis of their aggregate percentage scores, were regarded as high- and low-achievers respectively, while the students within the middle 46% were designated as average-achievers. This led to the identification of 198 high-achievers, 339 average-achievers, and 198 low-achievers. These three groups were further categorized into three intelligence groups, that is, high-average-, and low-intelligence groups, their cut-off points, again, being top 27%, middle 46%, and bottom 27% respectively, considered on the basis of combined DIQs of the two intelligence tests (verbal and nonverbal).

In the second phase, three-stage analyses of
correlates of academic achievement were undertaken. In the first stage, styles of learning, locus of control, and achievement motivation were examined in respect of the total sample which represented the normal distribution of the entire range of (1) intelligence and (2) achievement, that is, high-, average-, and low-achievement taken together.

In the second stage, a study of styles of learning, locus of control, and achievement motivation of high-, average-, and low-achievers (three levels of discrepant academic achievement) was made.

In the third and final stage, the position of styles of learning, locus of control and achievement motivation measures of high-, average-, and low-achievers was examined at three different levels of intelligence.

The statistical design consisted of Multitrait-Multimethod Approach. The whole study centered around the following three broad objectives:

1. To obtain a 'global picture' of styles of learning, locus of control, achievement motivation, and intelligence which are correlates of (1) the total sample, (2) high-achievers, (3) average-achievers, and (4) low-achievers, and so derive a comparative picture of (1), (2), (3), and (4). To accomplish this, statistical techniques of Multivariate correlation and Multivariate Factor Analysis were employed.
2. To obtain the analytical picture of styles of learning, locus of control, and achievement motivation which are correlates at all the stages mentioned above, together with the correlates of academic achievement of high-, average-, and low-achievers at three levels of intelligence. In order to achieve this objective, Bivariate Correlational Analysis, t values and mean profiles were found to be the most suitable statistical techniques.

3. To obtain analytical picture of styles of learning, locus of control, achievement motivation, and intelligence for three levels of discrepant academic achievement (high-, average-, and low-achievement) based on nationality, sex, and faculty. Here, the statistical technique of t values was found to be most appropriate. The tools employed for data collection were selected in conformity with the objectives of the study and availability of suitable tests. The three levels of intelligence were identified, using two intelligence tests, namely, Raven's (1960) Standard Progressive Matrices (nonverbal) and Jalota's Group Test of General Mental Ability (verbal). The scores of these tests were combined, after converting the respective test scores into standard scores, DIQs, and then averaged. The criterion measure of academic achievement was taken as the aggregate percentage of marks obtained in the final examinations.
conducted by the Panjab University for B.A/B.Sc parts 1 and 2 in April, 1989.

Three other tools were employed to identify the correlates of academic achievement, high-, average-, and low-achievement, at different levels of intelligence. These were: (1) Ramsden and Entwistle's (1981) Approaches to Studying Inventory, (2) Rotter's (1966) I-E Scale, and (3) Robinson's (1961) Achievement Motivation Scale.

The final data collected with the help of the above-named tools yielded 37 raw scores for each of the students making up the sample (N=735). Out of these 37 measures, the first score stood for the criterion variable, academic achievement (ACH). While the next 20 scores corresponded to the 20 learning style dimensions (DA, RI, UE, IM, SA, FF, EM, DS, ST, NA, AM, CL, GT, OL, IP, MO, RO, AO, & HO), the 22nd and 23rd scores corresponded to the Locus of Control and Achievement Motivation measures respectively (LC, & N-ACH). Finally, the last 14 scores matched the 14 measures of Intelligence (NS, MI, FI, VS, VO, CF, AN, BA, R5, V INT, NV INT, DIQ1, DIQ2 & DIQComb).

Results

All the results were obtained directly from the computer but for minor manual calculations. Descriptive statistics and F values for all the score distributions of the total sample, high-, average-, and low-achievers were
obtained to test the normality and linearity of score distributions pertaining to each of the variables under consideration.

The first 23 hypotheses were tested with the help of t values and mean profiles with a view to obtaining an analytical picture of styles of learning, locus of control, and achievement motivation of the total sample, high-, average-, and low-achievers at different levels of intelligence, as also to obtaining an analytical picture of high-, average-, and low-achievers on the basis of nationality, sex, and faculty.

A variety of statistical techniques were employed for testing the remaining 13 hypotheses. Single factors, combination of factors, and factor constellations were studied to find out the styles of learning, locus of control, achievement motivation and intelligence dimensions which were correlates of the total sample, high-, average-, and low-achievers, as well as of the Indian and African samples. To obtain these results, Bivariate Correlational Analysis, Multivariate Correlational Analysis, and Multivariate Factorial Analysis were employed. Bivariate Correlational Analysis served to explore the 'common' and 'specific' styles of learning, locus of control, achievement motivation, and intelligence dimensions which were correlates of the total sample, high-, average-, and low-achievers, as well as of
the Indian and African samples. Multivariate Correlational
Approach helped in finding out the variance in academic
achievement accounted for by different measures in
different combinations. For Factor Analysis, Holtelling's
(1935) Principal Component Method was applied which
yielded differential factor structures of the independent
variables in the context of academic achievement for these
groups.

CONCLUSIONS

Nature of Data

Some of the major general inferences warranted by the
empirically obtained data of this investigation are given
below:

The phenomenon of high-, average-, and low-
achievement existed as a consequence of normal variations
between individuals, and low-achievement was not a "matter
of pathology" (Yule et al, 1974).

High-achievement and low-achievement existed at equal
frequency.

On the basis of descriptive statistics, it was
observed that the score distributions of the different
measures for the total sample, high-, average-, and low-
achievers were nearly normal with only minor deviations.

The linearity of different independent measures on
the criterion measure was also established in most of the cases. However, there were a few exceptions. The measure of achievement motivation was found to bear nonlinear relationship with the criterion measure for all the four groups, that is, total group, high-, average-, and low-achievers.

As evinced by the findings made through the verification of the 31 hypotheses of the present study, the following conclusions were crystallized:

Global Picture of Correlates

The independent variables selected for the study contributed differentially to the prediction of academic achievement of the total sample, high-, average-, and low-achievers within the group and from group to group. Results of regression analyses revealed that there were 32 affective variables for the total sample which had total predictive power, $R=.52$. There were 30 affective variables for the high-achieving group, having a total predictive power of $R=.53$. The total predictive power of the 33 affective variables which were observed for the average-achieving group was $R=.56$, while that of the 31 affective variables for the low-achieving group was $R=.61$. It is obvious from these results that the affective variables for the low-achieving group had maximum predictive power, while the affective variables for the total sample had
least predictive power. With the predictive power (R) of
the affective variables for the total sample, high-, 
average-, and low-achievers standing at .52, .53, .56, 
and .61, $R^2$ had emerged, correspondingly, with the values 
of .27, .29, .31, and .38, indicating, thereby, that the 
criterion variable could be predicted to the extent of 
27%, 29%, 31%, and 38% for the total sample, high-, 
average-, and low-achievers respectively. One fascinating 
trend, here, was the increase in precision of prediction 
of the criterion measure with a decline in the achievement 
level.

Comparison among the four groups showed that 
significant variance in academic achievement of the total 
sample was contributed by DIQ_{Comb}, AO, VS, HO, IP, UE, and 
DA. Significant variance in ACH of high-achievers was 
contributed by VO, AO, GT, SB, DIQ$_2$, n-ACH, CL, FI, HO, 
and DS. Significant variance in ACH of average-achievers 
was contributed by IP, DA, LC, BA, SB, VS, DIQ_{Comb}, n-ACH, 
and UE. SA, n-ACH, CF, RI, HO, DS, AO, and NS had 
contributed significantly to the variance of ACH of low-
achievers.

A secondary purpose of the study was to determine the 
independent contribution of the selected independent 
variables to the prediction of undergraduate achievement. 
Results of the regression analyses did not reveal any 
systematic pattern of predictions for the total group,
Differential factor structures for the total group, high-, average-, and low-achievers amply confirmed the findings that certain dimensions of the selected independent variables combined in specific constellations to yield common factor/factors with academic achievement of the total sample, high-, average-, and low-achievers. Even if the factor labels were the same, the four major groups (TS, HAs, AAs, & LAs) differed in the magnitude and direction of significant loadings of different factors.

Analytical Picture of Correlates

Results based on zero-order correlations between the independent variables and the criterion variable revealed that out of a large pool of 36 independent measures which were assumed to be related to academic achievement, only one measure, namely, $\text{DIQ}_{\text{Comb}}$, was found to be the common correlate of academic achievement of the total sample as well as high-, average-, and low-achievers. However, even though this variable was associated with better attainment of all these four groups, the magnitude of zero-order correlation of this measure differed from one group to another.

Multiple Regression Analyses of the learning style
variables, locus of control, achievement motivation, and intelligence variables with academic achievement of undergraduate students, for the total sample, high-, average-, and low-achievers yielded differential values of $R^2$, that is, .27, .29, .31, and .38 for these groups respectively. Considering the individual contribution of this common correlate to academic achievement, the pattern and order of predictability differed somewhat in the total sample, high-, average-, and low-achieving subsamples. It added considerable predictive power and made a significant independent contribution to the explained achievement variance for total sample (14.7%), high-achievers (.7%), and average-achievers (3.3%), while for the low-achievers, DIQ_{Comb} was observed as a nonaffective variable.

Factor structure for the total sample, high-, average-, and low-achievers demonstrated that this common correlate, DIQ_{Comb} combined with other independent variables in different configurations and contributed differentially towards explaining common factor variance of different factors.

The statistical technique of t test was useful in finding out the mean differences of different measures among the high-, average-, and low-achievers and their comparative position when high-, average-, and low-achievers were studied at three different levels of
intelligence. Comparison of nine pairs of groups, that is, low- and average-achievers, low- and high-achievers, and average-and high-achievers at high-, average- and low-levels of intelligence (LA_h~AA_h, LA_h~HA_h, LA_a~AA_a, LA_a~HA_a, AA_a~HA_a, LA_1~AA_1, LA_1~HA_1, & AA_1~HA_1) revealed a thought-evoking result which indicated that though this measure, \( \text{DIQ}_{\text{Comb+}} \) was significantly and commonly associated with the achievement of the high-, average-, and low-achievers, significant mean differences were observed between four of the nine pairs of groups for this variable. In other words, high-achievers of high level of intelligence protended significantly higher mean score than did the average-achievers of corresponding level of intelligence with regard to \( \text{DIQ}_{\text{Comb}} \). \( \text{DIQ}_{\text{Comb}} \) also showed higher mean score for high-achievers of average level of intelligence than for the low-achievers of the corresponding level of intelligence. Similarly, this common correlate, \( \text{DIQ}_{\text{Comb+}} \) showed higher mean score for the high-achievers of low level of intelligence than for the average-or low-achievers of the same level of intelligence.

So, it could be safely concluded that though there might be a common correlate of academic achievement, yet significant mean differences could, still, differentiate between low- and average-achievers, low- and high-achievers, or average- and high-achievers at different levels of intelligence.
Two correlates, namely, NVint, and DIQ$_2$ showed that though these were commonly associated with ACH of the total group, high-, and average-achievers, still the high-achievers of high and low levels of intelligence obtained significantly higher mean scores than did the average- and low-achievers of the corresponding levels of intelligence.

Although FI was commonly associated with ACH of the total group, average-, and low-achievers, yet high-achievers had greater mean score than did the average- and low-achievers at high level of intelligence. Two other correlates, Vint and DIQ$_1$ were commonly correlated with the total group, average-, and low-achievers. But still the average-achievers had greater mean scores than low-achievers at average level of intelligence.

Another correlate, NA associated commonly with the total group, high-, and low-achievers. Still, high-achievers of high level of intelligence had lesser mean score than did the average- and low-achievers of corresponding level of intelligence, while average-achievers of average level of intelligence had lesser mean score than the low-achievers of the same level of intelligence, and average- and high-achievers of low level of intelligence had lesser mean scores than did the low-achievers of the same level of intelligence. AO was another common correlate of the total group, high-, and
low-achievers but even then, the high-achievers of high level of intelligence had lesser mean score than did the low- and average-achievers at the same level of intelligence. Average-achievers of average level of intelligence had lesser mean score than did the low-achievers of the corresponding level of intelligence, while at the low level of intelligence, average-achievers, again, had lesser mean score than the low-achievers.

Four correlates, namely, DA, SB, CF, and RS were commonly associated with ACH of the total group and average-achievers. Common correlate, DA differentiated between mean scores of high- and low-achievers, and high- and average-achievers at different levels of intelligence. Common correlate, CF differentiated between low- and average-achievers at high and average levels of intelligence, while common correlate, RS differentiated between low- and average-achievers at high and average levels of intelligence, and common correlate, RS differentiated between low- and high-achievers, average- and high-achievers at average level of intelligence. Common negative correlate, SB did not differentiate among high-, average-, and low-achievers at different levels of intelligence. Thus, it could be rightly inferred that a common correlate does not necessarily warrant mean differences between different pairs of groups.

Two specific correlates of ACH of the total group,
namely, AO and VO showed as many as four significant mean differences between different pairs of groups at different levels of intelligence.

Two specific correlates of ACH of average-achievers, namely, RI and LC showed no significant mean differences between the different pairs of groups at different levels of intelligence.

One specific correlate of ACH of low-achievers, that is, DA showed very few significant mean differences between different pairs of groups.

Based on these results, it could be concluded that a measure which pans a common correlate of academic achievement of different groups might still show significant mean differences among the groups and that a measure which pans a specific correlate of academic achievement of particular group might exhibit significant mean differences between that group and other groups.

Apart from the common and specific correlates of ACH of the total sample, high-, average-, and low-achievers, styles of learning dimensions of FF, EM, GT, and OL proved to be redundant measures which did not correlate with ACH of the total sample, high-, average-, or low-achievers. While FF, EM, and OL showed only a few significant mean differences between different pairs of groups at different levels of intelligence, GT showed no significant mean differences between different pairs of groups. Results of
Multiple Regression Analysis showed that these measures accounted for negligible variance in the criterion.

Significant mean differences observed among high-, average-, and low-achievers belonging to three different levels of intelligence provided empirical evidence to the fact that high-, average-, and low-achievers were, in themselves, heterogeneous groups and could be distinguished within themselves at different ability levels.

Although the factor of intelligence was controlled among the total group, high-, average-, and low-achievers or among high-, average-, and low-achievers at each of the three levels of intelligence throughout the investigation, yet DIQcomb proved to be adding considerable predictive power and making a significant independent contribution to the explained achievement variance for the total sample, high-, and average-achievers. This variable, however, did not add significantly to the explained variance in ACH of the low-achievers.

One finding of interest was that 11 common measures significantly differentiated Science students from Arts Students at all levels of achievement. Science students were characterized by higher academic performance, better styles of learning, higher mathematical ability, higher logical thinking, and higher intellectual ability. This result suggested that when exploring possible reasons for
lower achievement of Arts students, it would be even more crucial to be aware of non-intellectual factors than when considering similar lower achievement for science students.

Another startling finding was that four common measures significantly differentiated males from females at all levels of achievement. Females were characterized by better academic performance, higher mathematical ability, and higher reasoning. Similarly, this result indicated that when exploring possible reasons for lower achievement of males, it would be even more crucial to be aware of intellectual factors than when considering similar lower achievement for females.

One other finding of importance was that six common measures significantly differentiated Indian students from African students at all levels of achievement. Indian students were characterized by better academic performance and better styles of learning. This result suggested that when exploring possible reasons for the poor achievement of African students, it would be even more crucial to be aware of the influence of culture on learning styles than when considering similar lower achievement for Indian students.

In summary, this study indicated that the particular package of cognitive and noncognitive variables investigated had significant effects on the achievement of
undergraduate students and that styles of learning, locus of control and achievement motivation should not be ignored in the prediction of academic achievement. The investigator felt that a deeper understanding of non-intellective characteristics of college students as well as insight into the interplay of culture in learning processes might also provide a useful framework for all those committed to effective academic achievement of undergraduate students comprising of Indians and foreign nationals.

Practical Implications

Some benefits of including styles of learning, locus of control, and achievement motivation as influencing factors in the academic efficiency of college education are relevant as they influence students' attitudes and interests. As such, they cannot be ignored when considering the academic effectiveness of a student. Infact, students can be involved as agents of change and such a change can be effected by the accepting and personal approaches of teachers. Groffman (1971) and Brophy (1979) also stressed the need for mutual cooperation and respect between teacher and student in the education process, in order to facilitate major academic gains.

A recognition of affective influences by college
personnel may cause student interests to coincide with the goals of the college administration. This may lead subsequently to overt support for school programs and changes in personnel as well as more effective communication among students, parents, and teachers. This point of view has been emphasized by Messick (1978) and Mahoney (1974).

Educational institutions should take direct interest in ensuring that the emotional and cultural development of a student is accorded appropriate importance in any program of academic concentration. As such, values, attitudes, and self-esteem are frequently highlighted in the research literature as the most crucial affective factors (Hesburgh, 1979; Epstein, 1973). These affective characteristics are important in determining the way individuals react to social situations and this knowledge may help them in formulating personal goals. Especially important is the role of the educational institutions in cultivating and reinforcing values that are meaningful and significant to the student. Tjosvold (1977) reported that students tend to be happier and achieve greater academic success when capable of making significant choices in their daily schedule of activities.

It may be necessary that any student joining a college should be subjected to an initial assessment during which attention should be divided between
assessment of affective variables and academic variables. Such data are likely to give a more complete picture of the standing of the student and can thus provide the basis of any counseling which may be necessary in the future.

Specifically, since styles of learning is such an important factor in academic achievement, teachers as significant people in the lives of learners should be made aware of their responsibility in identifying individuals' learning styles, matching teaching styles with stronger learning styles for difficult, meaningful learning tasks, strengthening weaker learning styles as some tasks demand a particular style, and helping students learn to choose appropriate styles of learning since appropriateness depends on both the learner and the task (More 1987).

Research Implications

Since this study involved a sample of undergraduate students, it would be interesting to replicate it with a sample of secondary school students to determine whether styles of learning, locus of control, and achievement motivation affect the secondary school achievement (at different levels of intelligence) in the same way. Such studies may be undertaken in rural areas and compared with similar findings from urban areas to determine whether these same factors are situationally operative.

There is need for further validation of the Approaches to Studying Inventory, the instrument used for
measuring several dimensions of styles of learning in this study. The lack of sufficient studies in the research literature employing this instrument is a drawback. Thus, the validation studies suggested here will yield useful information about the validity and reliability of the Approaches to Studying Inventory.

Styles of learning should be investigated as a single factor affecting academic achievement, given the suitable, valid and reliable tools to make the measurements. Not only should styles of learning be investigated for its direct influence on academic achievement, but the variables which influence styles of learning, such as personality, self-concept, and socio-economic status should be, similarly, probed. Information obtained from such studies should be useful to counselors, parents, and teachers concerned with the effect of styles of learning on academic performance. It is, perhaps, pertinent to state that educators working in this area depend more on professional judgment and experience than on the research findings.

Finally, it would be interesting to replicate this study, further assessing the influence of styles of learning, locus of control, and achievement motivation on academic achievement for other groups such as the learning disabled, gifted, or delinquent adolescents. It would also be expedient to replicate the cross-cultural study on
styles of learning for different cultures other than the Indians and Africans. Doubtless, the results of such studies would have merit for both theoretical and classroom application.