The present research was designed to study the effect of anxiety (State and trait), intelligence, and psychological stress on learning and academic achievement. Anxiety is a worldwide phenomena and has come into greater prominence in recent times. It has captivated the attention of numerous psychologists and investigators and a large amount of research has devoted to it. This is due to the increasing awareness of its far-flung influence in the field of learning in general, and academic achievement, in specific. In life today every individual is obsessed by psychological pressures to achieve more and more both on the economic and social front. These pressures lead to various tensions and strains. Such resulting tensions are more often disruptive and result in performance decrements and discrepancies in potential and performance. A large number of researchers have investigated the problem of anxiety and learning, but they approached the problem from different points of view. Their findings could not be integrated because of lack of operational definition of anxiety. Hence, study of anxiety has been handicapped by the absence of consensual operational definition of the construct. A number of viewpoints have been expressed by various investigators in anxiety research resulting in ambiguity in the status of anxiety as a psychological concept. It has been pointed out by Spielberger that this confusion has been largely due to the lack of communication and uses of different terminology in the descriptive status. To clarify the ambiguity and semantic confusion Spielberger proposed to discriminate the use of the term to refer to two related,
yet logically very different constructs, i.e., anxiety as a
transitory emotional state (A-State) and as a relatively stable
personality trait (A-Trait).

In the present investigation Spielberger's formulations
of State-Trait Anxiety Theory (STAT) and his extension of drive
theory to incorporate individual differences in intelligence, were
tested. An alternative theoretical position suggested by Malmo
(1958) in the interaction of drive and other variables as they
effect performance or learning was also used to interpret the
findings. The main objective of the investigation was to study some
of the deductions from these major extensions of drive theory and
STAT.

Researchers in drive theory tradition have exposed Ss
to ego-involving instructions. Anxiety has to be aroused to be
effective. Empirical evidence has shown that physical stressors
are not potent stressors as are psychological or ego stressors
that produce differential levels of A-State in high- and low-A-Trait
subjects (Ss). Ego-involving conditions (psychological or ego-
stress) were considered to be a very important variable in anxiety
research. Effects of anxiety have been shown to be different at
different stages of learning because of effect of practice. Therefore
stages of learning was also considered to be an important variable.

The whole study was divided into two phases. Phase I
consisted of two laboratory learning tasks of moderate difficulty
level, i.e., serial verbal learning (SVL) and paired-associate
learning (PA). Phase II consisted of academic achievement in
aggregate and five different school courses. In phase I, involving SL and PA, separate hypothesis were formed for State anxiety and trait anxiety. Further, separate hypothesis were formed for stress and control conditions. It was assumed that different levels of anxiety would be aroused in high and low anxious Ss as a result of the experimental conditions. Following hypothesis were formulated:

**Hypothesis for Phase I:**

**Hypothesis for Analysis Involving Trait Anxiety:**

1. Ego-stress instructions would induce differential levels of drive in HA and LA Ss.
2. Early in learning HA would facilitate performance of HI Ss, while leading to performance decrements in Ss with LI.
3. Effects of anxiety and intelligence would further depend on the experimental conditions of ego-stress and control.
   a) Under ego-stress LA would have facilitative effects on performance of both the intelligence groups (HI and LI), while HA would lead to impairment in performance at both the intelligence levels. These effects would be more pronounced in the early stages than in the later stages of learning.
   b) Under the control conditions, it was expected that HI-HA Ss would perform better than their HI-LA counterparts, while LI-LA Ss would perform better than LI-HA counterparts, especially in the early stages of learning.
4. Facilitative effects of HA would occur in learning for words at the extremes of the list than for the words embedded in it. These effects would further depend upon the experimental condition under which the Ss performed.
The hypotheses for paired-associate learning were also same except that serial position effects were not explored (hypothesis No.4).

Hypotheses for Analysis Involving State Anxiety:
1. State anxiety scores would be better predictors of performance than trait anxiety scores.
2. Interactive relationship between A-State and intelligence was expected to be of higher significant level than A-Trait and intelligence.
3. It was expected that low A-State would have facilitative effects on the performance of both the intelligence groups (HI and LI) at all the stages of learning.

Phase II
The following hypotheses were tested for Academic Achievement:
1. Anxiety (A-Trait) and intelligence would be negatively correlated.
2. HA would facilitate achievement of HI Ss. LI-LA Ss would achieve less as compared to LI-LA counterparts.
3. Anxiety and intelligence would have differential effects on different school courses.

In order to test these hypotheses, a repeated measures factorial design $A \times B \times C \times D (2 \times 2 \times 2 \times 5)$ for analyses involving A-Trait scores, was used, with two levels of trait anxiety (high and low), two levels of intelligence (high and low), two experimental conditions (stress and control), and five stages of learning (each stage consisted of five trials), for each of the two tasks, i.e., serial verbal learning and paired-associate learning. The design
provided a total of forty cells. There were 30 Ss in each cell.
The sample of the study consisted of 240 subjects. Half of the Ss
were assigned to experimental condition of stress and the other half
to control condition. The subjects were the students of 10th standard,
studying in various government controlled schools.

A sample of 240 subjects, i.e. high school girls was
selected from a preliminary sample of 1149 subjects who were tested
on the STAI - A-Trait questionnaire and Hundal's General Mental
Ability Test. On the basis of their scores on these two tests,
subjects were assigned to high (mean + 1SD) and low (mean -1SD) anxiety
and intelligence groups. The scores of HA Ss ranged from 47 to 60
and those of LA from 25 to 40 and the scores of HI Ss ranged from 50
to 80 and LI from 11 to 37.

Another factorial design A x B x C (2x2x5) was used for
analyses with A-State scores, with two groups of state anxiety (high
and low), two levels of intelligence (high and low), and five stages
of learning (each stage of five trials), for both of the learning
tasks. In these analyses the variable of stress was eschewed, as
stress and state anxiety were found to be highly correlated (rpb1 .60; .65). Therefore stress was not considered to be an independent variable.
This factorial design (repeated measures) provided twenty cells with
40 Ss in each. Hence, a total number of 160 Ss were considered for
analyses with A-State scores. These 160 Ss were drawn out of the final
sample of 240 subjects on the basis of their scores on STAI A-State
questionnaire administered after the completion of each of the two
learning tasks, serial verbal learning and paired-associate learning,
and were assigned to high (mean +1SD) and low (mean -1SD) anxiety groups. Scores of HA (A-State) group, after serial verbal learning task, ranged from 55 to 76 and LA (A-State) from 20 to 38. After paired-associate learning, range of scores for HA (A-State) and LA (A-State) was from 55 to 72 and 20 to 36, respectively.

It was observed that rate of learning was different for words at different positions in the serial learning list. The effects of serial position were considered and on the basis of mean number of correct responses words at serial position 1, 2, 3 and 12 were designated to be 'easy' and at 5, 6, 8, 9 were designated as 'hard'. A factorial design A x B x C x D (2x2x2x2) was employed, with two levels of task difficulty ('Easy' and 'Hard') words, two groups of trait anxiety (high and low), two levels of intelligence (high and low), and two experimental conditions (stress and control). All the 240 subjects who participated in laboratory learning tasks were considered for this analysis. Similarly, effects of serial position, were analyzed with the help of a factorial design A x B x C (2x2x2), two level of task ('easy' and 'hard'), two levels of state anxiety (high and low), two levels of intelligence (HI and LI) on the basis of A-State scores by taking total number of 160 subjects.

Phase II of the study, consisted of analyses of achievement scores in aggregate, and five school courses, i.e., general-science, mathematics, English, first-language, and social-studies. A 2x2 factorial design was employed on achievement data, separately for the six indices of achievement, with two levels of intelligence.
(high and low), and two levels of trait-anxiety (high and low).
Each of the four cells consisted of 45 subjects. Achievement scores were based on a uniformly conducted examination by the school Board of Education and these scores were available for 180 subjects only, out of the total of 240 subjects who participated in studies covered in Phase I.

Following instruments were used in the present study:
2. Hindi version of Hundal's General Mental Ability Test.
3. Serial verbal learning task; a list of 12 CVC nonsense syllables of moderate difficulty was prepared. The associative values of the syllables ranged from 43% to 56%. These values were based on associative values calculated by taking 200 words from Glaze's (1928) list, and administering them to 100 Ss of comparable age, educational level and urban background. It was done firstly because the meanings of words change from time to time and secondly, to cover up the linguistic and cultural differences between the Indian and American populations.

In order to empirically check upon the difficulty level of the task, pilot work was done on 70 Ss of same age, sex, educational level, and intelligence as was in the final sample.
4. Paired-associate learning task; a list of 12 Hindi paired-associate (meaningful) was made. Stimulus and response members of the list were highly correlated and were taken from a list prepared by Dr. P. Varma. Response words were randomly paired with the stimulus words in a manner that pairs did not have any logical relation.
It was done to bypass the possibility of rote learning. Although the list was initially designed to be of moderate difficulty yet for further check pilot work was done on 70 comparable Ss.

5. Academic achievement scores in aggregate and different school courses were collected from school records.

For both the laboratory learning tasks, criteria for learning was kept at two consecutive errorless trials or twenty-five trials at the most. Each of the 240 Ss first learnt serial verbal learning list. After the S had learnt it up to one of the criteria, A-State questionnaire was administered with instructions to fill it according to how she felt during learning that task. After a brief rest period, the next task, i.e., of paired-associate learning list was learnt by the same S up to one of the criteria, followed by A-State questionnaire. Prior to administration of the learning tasks Ss were given instructions according to the experimental conditions of ego-stress or control besides standard instructions for the learning tasks.

In Phase I, the dependent variable was the mean number of correct responses on both the learning tasks. These data were subjected to analyses of variance in the following order, (Separately on the basis of A-Trait and A-State). A factorial design of $A \times B \times C \times D$ was employed on the data (SL) of A-Trait groups. $A$ referred to five stages of learning, $B$ two groups of anxiety (HA and LA), $C$ two levels of intelligence (HI and LI), and $D$ two experimental conditions (ego-stress and control). Further an experimental design of $A \times B \times C$ was employed on the raw data of
groups made on the basis of A-State scores.

To explore the serial position effects A x B x C x D design was applied. In this design A referred to task (hard and easy), B two levels of trait anxiety (HA and LA), C two levels of intelligence (HI and LI), D two experimental conditions (ego-stress and control). Similarly data of A-State groups was operated upon A x B x C design.

Data obtained from paired-associate task was analyzed in the same way, first in terms of A-Trait (A x B x C x D) and then in terms of A-State (A x B x C) factorial designs.

Phase II data involving academic achievement scores in aggregate and five different school courses was operated upon 2x2 factorial design with two levels of trait anxiety (HA and LA) and two levels of intelligence (HI and LI).

Results of the Study are presented below:

PHASE I

Results obtained on Serial Verbal Learning Task: A-Trait Analysis

There were some problems in interpreting lower order interactions when higher order interaction was significant. So Lindquist's suggestion was followed that any higher order interaction might be interpreted as the interaction of one factor with the interaction of the remaining. For instance, a four factor interaction can be regarded as the interaction of one factor, e.g., D, with the triple interaction of the three, e.g., ABC. It seemed justified to interpret only the significant higher order interactions.

1. The significant A x B x D (stages x anxiety x stress) interaction indicated that effect of anxiety at different stages of learning was dependent upon the experimental condition under which the S
performed on the task. Thus under ego-stress condition performance of HA was debilitated at all the stages of learning as compared to LA counterparts under the same experimental condition. However, under the control condition performance of HA was better than LA counterparts.

2. The significant $A \times C \times D$ (stages x intelligence x stress) interaction revealed that the effect of intelligence at different stages of learning, too, depended upon the experimental conditions, namely ego-stress and control. Under both the experimental conditions, performance of HI was significantly superior to that of LI counterparts consistently at all the stages of learning. However, the magnitude of difference in the performance of intelligence groups was very large under stress condition and not so large under control condition.

3. Following Lindquist’s suggestion the significant $A \times B \times C \times D$ interaction was interpreted in three different ways namely, $C(ABD)$, $B(ACD)$, and $D(ABC)$. The significant $A \times B \times C \times D$ interaction revealed that effect of stages of learning (early and later learning), anxiety, and ego-stress had been different for the two levels of intelligence. In another way, effects of stages of learning, anxiety and ego-stress were different for the two experimental conditions and so on.

(i) HI-HA group, under control condition performed at higher level consistently at all stages of learning than its counterparts under the experimental condition of ego-stress. Similarly HI-LA group under control condition performed better than its counterparts under ego-stress at all the stages of learning.
(ii) At LI level too, ego-stress had detrimental effects on performance of both the anxiety groups but these effects were more pronounced in case of LI-HA group almost at all the stages of learning. Under control condition performance of LI-HA group was slightly better than the LI-LA group except in middle stages.

(iii) The effect of ego-stress was so pronounced that performance of HI-HA was poorer to the performance of LI-HA under control condition especially in the early stages of learning.

(iv) The effect of ego-stress seemed to be more pronounced in case of HA than LA Ss, irrespective of the intelligence level. Further, comparison in performance of ego-stress and control conditions revealed that learning occurred at much slower rate under ego-stress.

(v) In case of HI, under both the experimental conditions and for both the anxiety groups learning was complete, however it was not so in case of LI groups.

(vi) No striking differences in performance due to anxiety level, at any stage of learning were observed. HA Ss performed better than LA Ss under the control condition at both the intelligence levels and at all the stages of learning, but the trends were not significant.

Results obtained on Serial Verbal Learning: A-State Analysis:

1. The significant A x B interaction showed that the effect of state anxiety was different at different stages of learning. LA Ss performed better than HA Ss at all the stages of learning and rate of learning was faster for LA Ss.
2. The significant A x C interaction indicated that there was
difference in the performance of two intelligence groups. As
expected HI Ss performed significantly better than LI Ss, consistently
over all the stages of learning.
3. There were inherent limitations in discussing the lower order
interactions as for instance, in A x B interaction effects of C were
averaged out and in A x C interaction effects of B were averaged out.
So when the higher order interactions were significant, it seemed
more appropriate to discuss only the higher order interactions in
detail.

The significant A x B x C interaction revealed that
(i) HI-LA Ss performed better than HI-HA Ss consistently at all the
stages of learning. However, the magnitude of difference in the
performance of both the anxiety groups at HI level was very small
in the early stages of learning and in the later stages of learning,
both the anxiety groups reached almost the same level of performance.
(ii) Similarly LI-LA Ss performed better than LI-HA Ss at all the
stages of learning. However, the magnitude of difference in
performance was small in the early stages, increased in the middle
and was again small in the later stages of learning. On the whole
performance of LI-HA was most detrimentally affected.

Pattern of results obtained in state anxiety analysis was
almost similar to those obtained with ego-stress in trait anxiety
analysis.

Results obtained on Serial Position: A-Trait Analysis:
1. Results confirmed the contention that there were opposing facilitative
and inhibitory tendencies in serial verbal learning lists. HA
facilitated the learning of anchoring words and debilitated the learning of words somewhat in the middle of the list.

2. The significant $A \times C$ interaction indicated that the performance of HI and LI groups was not significantly different for the 'easy' words, whereas, HI Ss performed considerably better than LI Ss on 'hard' words.

3. The significant $A \times D$ interaction indicated that the experimental conditions, namely ego-stress and control, had produced differential effects on 'easy' and 'hard'. Ego-stress had debilitative effects on the performance on both 'easy' and 'hard' parts of the list, but these effects were more pronounced in case of 'hard' parts of the list than the 'easy' parts of the list.

4. Rest of the interactions, i.e., $A \times B$, $A \times B \times C$, $A \times B \times D$, $A \times C \times D$, $A \times B \times C \times D$ were nonsignificant. This might have happened because the size of the task got reduced considerably. The significant $A \times C$ and $A \times D$ interactions indicated that the variables of stress and intelligence contributed to the maximum variance.

5. A very important conclusion of the present findings was that serial learning task is not homogenous in terms of difficulty and serial position effects were important to be considered in studies dealing with serial learning tasks.

Results obtained on Serial Position : A-State Analysis :

1. $A \times C$ interaction was significant indicating that there was variance in the performance of both the intelligence groups on both
the 'easy' and 'hard' parts of the list. Obviously, performance of HI Ss was better on both the 'easy' and 'hard' words, although the magnitude of difference was greater in case of 'hard' words as compared to 'easy' words.

2. Findings were in line with the results obtained on serial-position effects with trait anxiety. However, no new and useful information had been provided by state anxiety analysis of serial position.

Results obtained on Paired-Associate Learning: A-Trait Analysis:

1. A significant $A \times B \times D$ interaction indicated that the effects of anxiety and ego-stress, at different stages of learning were not independent of each other. LA Ss under ego-stress performed better than HA Ss under the same condition in the early stages of learning and in the later stages HA Ss performed slightly better than LA Ss. Conversely, under the control condition HA Ss performed better than LA Ss in the early stages of learning, while in later stages performance of both the groups was almost similar.

2. The significant $A \times C \times D$ interaction revealed that HI Ss performed better than LI Ss under both the experimental conditions (ego-stress and control). However, the magnitude of difference was more under the ego-stress condition than under the control condition. Rate of learning was faster under the control condition than under the ego-stress condition.

3. Unlike serial verbal learning the $A \times B \times C \times D$ interaction in paired-associate learning was not significant. All the anxiety-
intelligence groups under both the experimental conditions could manage to learn the paired-associate list completely in fewer than criterion trials.

Results Obtained on Paired-Associate Learning: A-State Analysis:

1. The significant A x B interaction indicated that effect of stages of learning and state anxiety were not independent of each other. The LA (A-State) Ss performed consistently better than HA (A-State) at all the stages of learning. These trends were similar to those found in trait anxiety analysis of paired-associate learning under the ego-stress condition.

2. The significant A x C interaction indicated that HI Ss performed better than LI Ss at all the stages of learning. In paired-associate learning all the Ss could learn the paired-associate list in less than criterion trials. So in the later stages there was no difference in the performance of various groups.

3. There was significant A x B x C interaction. LA had facilitative effects on the performance of both the HI and LI Ss consistently at all the stages of learning. The magnitude of difference in the performance of HI-LA and HI-HA was less as compared to that of between LI-LA and LI-HA. However, the trends in this interaction were comparable with the trends found in A x C x D interaction in A-Trait analysis of paired-associate learning.

A-State provided results at a higher significance level than A-Trait. Findings were consistent with Malmo's theorizing especially those obtained under ego-stress condition or in terms of A-State.
PHASE II

Results obtained on Achievement in Aggregate:
1. HI Ss performed significantly better than LI Ss.
2. Effect of anxiety was not significant.
3. Interaction between intelligence and anxiety was significant.
   HI-HA Ss performed better than HI-LA Ss and LI-LA performed better than LI-HA Ss. At LI level magnitude of difference between the anxiety groups was more marked as compared to HI level.

Results obtained on Achievement in General-Science:
1. Like achievement in aggregate, HI Ss performed significantly better than LI Ss in General Science too.
2. Unlike aggregate achievement, effect of anxiety was significant. LA Ss achieved better scores than HA Ss.
3. Like in aggregate achievement, interaction between intelligence and anxiety was significant, but the trends were different. In general science achievement LA facilitated achievement at both the intelligence (HI and LI) levels. Magnitude of difference in the performance of two anxiety groups was large at LI level as compared to HI level.

Results obtained on Achievement in Mathematics:
1. Like in aggregate and general-science, HI Ss achieved significantly better scores than LI Ss in mathematics also.
2. Unlike general science achievement, effect of anxiety was not significant in case of mathematics.
3. Interaction between intelligence and anxiety was highly significant. LA had facilitative effects on the achievement at both the intelligence levels (HI and LI), though, of course, at HI level, the magnitude of difference in performance was small as compared to LI level.

Results Obtained on Achievement in English (Foreign Language):
1. Like all the above analyses, HI Ss achieved significantly better than LI Ss.
2. Effect of anxiety was not significant.
3. Interaction between intelligence and anxiety was highly significant. HA facilitated the achievement of HI Ss and debilitated that of LA counterparts. On the contrary LA facilitated achievement of LI Ss as compared to HA counterparts.

Results obtained on Achievement in First Language (Mother-tongue):
1. HI Ss achieved significantly better than LI Ss.
2. Effect of anxiety was not significant.
3. Interaction between intelligence and anxiety was significant. HA had facilitative effects on the achievement of HI Ss and debilitating effects on LA counterparts. At LI level, LA had facilitative effects, on achievement in first language, as compared to HA counterparts.

Results obtained on Achievement in Social-Studies:
1. Effect of intelligence was highly significant. HI Ss performed better than LI Ss.
2. Effect of anxiety was not significant.
Interaction between intelligence and anxiety was highly significant. At HI level, HA facilitated the performance and at the same intelligence level LA impaired performance. However at LI level, LA Ss had higher achievement than HA Ss of the same ability level.

In all the six analyses, as expected, HI Ss always achieved significantly higher scores than LI Ss. The main effect of anxiety was significant beyond .01 level only in case of achievement in general science. The major consistent finding was that the interaction between intelligence and anxiety was significant beyond .001 level in all the six analyses. On the whole, HA had detrimental effect on achievement at LI level. Analyzing achievement separately for various school courses confirmed the expectation that anxiety would have differential effects on different school courses.

While discussing the results two major approaches to the study of anxiety/performance interaction were extensively used, i.e., Yerkes Dodson law which conceived anxiety as generalized state of arousal and the second major model has a Hullian basis which considered anxiety as a drive.

CONCLUSION:

PHASE I

On the basis of the findings of the present study, it might be concluded that the performance of HA and LA Ss reflect differences in drive level only where experimental conditions contained some degree of stress. These findings supported Spence's reactivity hypothesis. Overall in serial verbal learning, there was difference in the performance of both the anxiety groups (HA and LA) at HI level,
under the experimental condition of ego-stress, performance of HI-LA was superior at all the stages of learning. Performance of LI Ss under ego-stress condition was most detrimentally affected by the stress instructions. Performance of LI group under stress condition showed difference in performance not so much attributable to drive level, as much to the experimental conditions. Findings under stress condition were consistent with Malmo's hypothesis that performance varied as an inverted-U function of physiological activation (drive). On the contrary, performance of HI-HA, under control condition was better than HI-LA counterparts and performance of LI-HA was better than LI-LA under control condition, especially in the later stages of learning. These findings under control condition supported Spielberger's extension of drive theory, contentions.

Results obtained in A-Trait analysis for serial verbal learning were not comparable with those obtained in A-State. However, obtained results endorsed the use of A-State measures in studies dealing with effects of anxiety and ego-stress instructions. It was considered important to take into account the nature and magnitude of situational stress by making effective measurements of the aroused drive in the experimental situation. Results involving A-State were more in line with Malmo's theorizing. Further, Spielberger's extension of drive theory to incorporate individual differences in intelligence was also supported.

Analyzing serial learning data in terms of stages of learning and with respect to serial position effects confirmed that the rate of learning was different for different anxiety-intelligence groups under both the experimental conditions and that these were opposing effects
of anxiety on items in the middle vs. the beginning or ends of the list. It was concluded on the basis of the present findings that for HI Ss, drive level or experimental conditions might not be so important as they were for LI Ss. Besides providing additional evidence that difficulty level in a serial task was determined by serial position of the syllables and that response tendencies change as a function of intra-task competition, the serial position analysis (A-Trait) did not reveal anything else. This factor about the nature of task imposed limitations on the earlier interpretations of serial learning. However when the serial position effects were interpreted in terms of A-State, it was confirmed that level of ANS arousal in an experimental situation was more relevant to interpret anxiety effects.

The paired-associate learning task was initially designed to be of moderate difficulty level, but Ss in all the groups and under both the experimental conditions could manage to learn the paired-associate list in fewer than criterion trials. Hence, most of the interactions were not significant in paired-associate analysis. It might have been primarily due to the nature of task. Results obtained with paired-associate learning task could not be compared with serial learning results. While paired-associate learning task proved to be easy or somewhere between easy to moderate for most of the Ss, serial learning task was somewhere between moderate to difficult.

As compared to A-Trait analysis of paired associate learning A-State analyses provided results at a higher significance level. There was a significant increase in A-Trait scores as a result of
ego-stress. So the predictions of extension of drive theory and state-Trait Anxiety theory could not be realized. Findings were consistent with Malmo's assumptions that performance varied as an inverted-U function of physiological activation (drive). It was found that LA Ss performed significantly better than HA Ss at both the levels of intelligence (HI and LI), over all the stages of learning. Findings of A-Trait analysis under ego-stress condition were comparable with the findings of A-State analysis. This lead to the conclusion that in the present investigation ego-stress and A-State effects were similar.

The present findings (both with serial learning and paired-associate learning) supported Spielberger's contentions that it was meaningful to posit state and trait anxiety as separate and distinct anxiety constructs in research on anxiety and learning. It was almost conclusively found that ego-stress was a very important variable in anxiety research. Further, it was more meaningful to make proper measurements of anxiety aroused in a particular situation and to interpret the findings in terms of that aroused anxiety (A-State). Both the analyses, (A-Trait and A-State) for both the learning tasks (Serial verbal learning and Paired-associate learning) did not provide support to Spielberger's extension of drive theory, evidently because in trait-anxiety analyses, anxiety level was not sufficient and in state-anxiety, it exceeded the level of effective performance. Therefore, the results, especially those obtained under ego-stress condition and in terms of state-anxiety were interpreted in terms of inverted-U hypothesis.
PHASE II

In academic achievement analyses anxiety as a main effect did not reach the level of significance except in case of achievement in general science. In the present investigation general anxiety scale (STAI A-Trait) was used. Sarason had concluded that anxiety-intelligence relationship was a function of the anxiety scale employed. Another important factor was that there was a long gap in the measurement of anxiety and the annual examination on which the achievement scores were based. It was concluded that high aptitude students tend to obtain good grades as compared to low aptitude students irrespective of the anxiety level. Further, within various school courses nature and content of the course varied. School courses demanding higher cognitive skills produced many error tendencies in HA Ss even at HI level. Present findings indicated that effects of anxiety were more marked for courses like general-science and mathematics. However, it was concluded that academic achievement was a complex matter and it involved various types of skills and abilities. Therefore, analyzing effects of anxiety and intelligence, separately for different courses was more meaningful.

Comparison of findings of laboratory learning and academic achievement revealed some similarities as well as differences. Results obtained on academic achievement, by and large, and those obtained on laboratory learning tasks under control condition were consistent with the predictions of Spielberger's extension of drive theory. Findings under ego-stress condition were not consistent with the above mentioned theoretical formats. It was found that the
effects of stress induced by artificial means in a laboratory and the natural occurring stress in an academic achievement situation were very different from each other. The abruptly introduced stress in an experimental situation proved to be more detrimental than the examination stress which accumulates gradually over some period of time.

It was concluded that even IQ alone has predictive efficiency. However, combination of anxiety with intelligence considerably increased the accuracy of predicting the academic performance. The present findings confirmed the earlier findings that general, by itself had relatively little influence on academic achievement.