CHAPTER-VI

DISCUSSION OF RESULTS

The present investigation was designed to study the effect of personality, fear of success and induced motivation upon problem-solving behavior of university and working women. There were two conditions of personality, i.e., neuroticism and stability, two conditions of fear of success, i.e., high fear of success and low fear of success and two motivational conditions, i.e., ego-oriented instructions and task-oriented instructions. Therefore, a factorial design of 2x2x2x2 was employed. There were sixteen groups, and in each cell fifteen subjects were used making the total sample of 240 subjects. To the final sample of 240 subjects six problem-solving tasks, i.e., horse trading problem (adapted from Maier and Solem, 1952), gold chain problem (adapted from Maier and Casselman, 1970), train problem (adapted from Maier and Janzen, 1969), Bhatia squares (Bhatia, 1955), prisoner's problem (Maier and Janzen, 1969) and Anagrams (adapted from Dominowski, 1966), were administered. The four problems, i.e., horse trading, train and gold chain problems and anagrams were assessed in terms of number of correct responses and were with a time limit. Bhatia squares and prisoner's problem were assessed in terms of trials and time taken without any time limit.
Chi-square test was applied to the right responses of first three problems to gauge the effect of personality, fear of success and induced motivation upon problem solving behaviour of university and working women. The results of the \( \chi^2 \) indicate that the \( \chi^2 \) values for two personality groups for all the three problems were significant at .01 level indicating that the two personality groups differ from each other on the three problems. No other chi-square value was found to be significant indicating that two fear of success groups, two motivational groups and two groups of women do not differ significantly from each other on the first three problems. The interaction chi-square values for each problem also failed to reach the significance level. On the basis of the equal level of task difficulty (estimated from the results of a pilot survey, see Table I) the right scores of these three problems were combined for the purpose of carrying out analysis of variance. The analysis of variance (ANOVA) was performed separately for the combined right scores of horse trading problem (adapted from Maier and Solem, 1952), gold chain problem (adapted from Maier and Casselman, 1970) and train problem (adapted from Maier and Janzen, 1969) and on trials and time taken to solve Bhatia squares (Bhatia, 1955) and prisoner's problem (Maier and Janzen, 1969) and on number of correct responses on anagrams.
Personality and Problem Solving:

The main feature of the present findings on the variable of personality is that stable subjects are performing better than the subjects with high neuroticism score on all the six problem solving tasks.

The results on the problems 1, 2 and 3 combined, on the variable of personality indicate that stables are performing better than neurotics, i.e., stables gave more correct responses than the neurotics on first three problems ($F = 68.38, P \leq .01$). On Bhatia square's problem solving task also the stables were found to perform significantly better than neurotics on both trials and time taken ($F = 122.43, P \leq .01$ for trials taken; and $F = 120.59, P \leq .01$ for time taken). Similar trend of results was found for prisoner's problem on the variable of personality ($F = 168.42, P \leq .01$ for trials taken; and $F = 12.51, P \leq .01$ for time taken) indicating that stables took less number of trials and less time to solve prisoner's problem than the neurotics. On anagrams problem solving task also, it was found that stables gave more correct responses than the
neurotics (F = 10.32, p<.01). For F-ratios see Tables VI, VIII, IX, XIII, XIV and XVIII, and for comparison of means see Table V.

The present results are in accordance with the hypothesis framed earlier where it was hypothesized that stables would perform better than the neurotics (see p.96-97).

In line with the present results, earlier investigators too have reported that neuroticism/anxiety has detrimental effect upon performance (anxiety and neuroticism are significantly and positively related e.g., Eysenck, 1955; Bendig, 1957, 1963; and Eysenck, 1985). Experiments have shown that high anxiety subjects were poorer in the learning of paired associate tasks than their low anxious counterparts (Mohsin, 1972; Stinke, 1973; Rabindradas and Narayanan, 1977; and Paul, 1980). The number of studies on serial verbal learning task also confirm the superiority of low anxious or stable subjects over high anxious subjects (Spielberger and Smith, 1966; Hodges and Spielberger, 1969; Krishna and Verma, 1972; Passi and Singh, 1972; Geen, 1976; Sharma and Wangu, 1976; and Ravinder, 1977).

Nijhawan and Cheema (1971), Nijhawan (1972) and Helode and Sawade (1985) have shown that high anxious subjects
or subjects with high neuroticism perform less well in maze learning than their counterparts with low neuroticism or low anxiety scores. Denny (1966) and Kianoosh (1977) found the detrimental effects of high anxiety in concept formation tasks.

Kumar (1975) found that stables were better than the neurotics on farmer's problem and prisoner's problem solving tasks. Upadhyaya, Chadha and Bhagat (1985) also found that anxiety affects performance on an attention task adversely.

Number of studies have shown the poorer performance of high anxiety subjects than their low anxiety counterparts on anagram problem solving task (Sarason, 1972, 1978, 1984; Carver et al., 1983; and Sharma and Sud, 1989). Sharma and Gupta (1988) in their study on school boys and girls found that subjects with high anxiety gave significantly less number of correct responses than their low anxiety counterparts on anagram problem solving task.

Rishi and Kumar (1986) in their study on anagrams, Bhatia squares problem and concept formation task found that stables perform better than neurotics.

Some indirect evidence can also be quoted to support the present results. The main bulk of evidence favours stability as a determiner of better academic attainment.
To explain the detrimental effect of neuroticism/anxiety on problem solving, the following explanation may be offered:

1. Anxiety or neuroticism is seen as a distractor, i.e., anxious subjects devote cognitive capacity to worry about the performance and thus have a less capacity to devote to the task (Wine, 1971; Weiner, 1972; Mandler, 1975; Sarason, 1975; and Humphreys and Revelle, 1984).

2. According to M.W. Eysenck (1977) high anxiety/neuroticism reduces working memory's capacity. Since working memory is typically involved in the processing the temporary 'holding' of information, any anxiety induced reduction in its capacity would inevitably have detrimental effects on performance of cognitive tasks. Number of researchers have found that anxiety reduces the available capacity of working memory and thus greatly impairs the performance on cognitive tasks (Hamilton, Hockey and Rejman, 1977; Mayer, 1977; Eysenck, 1981; M.W. Eysenck, 1983). Deffenbacher (1977, 1978), Zatz and Chasin (1983, 1985) and Darke (1988) also suggested that high anxiety subjects have
effectively smaller working memory capacity to devote to task resolution and therefore, are inferior in performance on capacity demanding tasks.

(3) The poor performance of neurotics as compared to stables in the present investigation may also be explained by the fact that anxiety leads to task-irrelevant cognitive activities or worry associated with high anxiety (e.g., Ganzer, 1968 and Morris and Liebert, 1970) Eysenck (1982) also found that high anxiety subjects engage in significantly more task-irrelevant processing than low anxiety subjects. Zorantonello et al. (1984) suggested that high anxious subjects display a reduced efficiency in anagrams solution and experience more cognitive interference during the task performance.

(4) The results of the present investigation can best be explained through the contentions of Hamillon (1983), who on the basis of experimental evidence (Spielberger, 1966, 1972; Liebert and Morris, 1967; Wine, 1971; and Sarason, 1975) suggested that high anxiety produces data and resource limitations in human information processing capacity. In other words, in the presence of anxiety, arousal will be used by the information processing system to generate associated long-term memory data. Their function is to retrieve
previously employed response strategies that led to anxiety reduction. Ferguson (1987) in her study on anagram task found that high anxiety leads to decreased information in take and defensive information processing.

**Fear of Success and Problem Solving:**

The results of the variable of fear of success on prisoner's problem solving task in particular, both for trials and time taken indicate that low fear of success group is performing better than the high fear of success group (F-ratio for trials taken = 4.05, P<.05 and F-ratio for time taken = 10.98, P<.01; see Table XIII and XIV). The means (see Table V) indicate that low fear of success group performed prisoner's problem in less number of trials and in lesser time than the high fear of success group. The trend on the other problems also shows the superiority of low fear of success group over high fear of success group, but the F-ratios failed to reach the desirable level of significance with the exception of trials taken on Bhatia squares (For means see Table V and for F-ratios see Table VI, VIII, IX and XVIII).

The results of the present investigation are in line with the contentions of Horner (1968) who suggested that presence of motive to avoid success in women interfere with
their performance because women expect negative consequences such as social rejection and/or feeling of being unfeminine as a result of succeeding. Horner (1968) found the motive to avoid success in women interferes with their performance, especially in competitive situations. Horner (1968) examined the effects of fear of success on performance under conditions in which this motive was aroused. The motive to avoid success was measured from the stories written in response to the following verbal cue: "After the first term finals Anne (John) finds her self (himself) at the top of her (his) medical school class". Females responded to Anne cue and males responded to John cue. Horner (1968) found that female's fear of success stories were characterized by three major themes, i.e., social rejection, concern with one's normality and femininity and denial. Horner (1968) showed that females whose stories showed fear of success performed better in non-competitive situation, whereas females whose stories did not show fear of success performed better in competitive situations. Because of the conflict between success and femininity, females with high fear of success were assumed to be inhibited in their performance in achievement oriented situations.

The present results are in line with the study of Zuckerman, et al. (1980) who found that effects of task outcome are moderated by fear of success. They suggested that
a person with high fear of success maintains a self defeating strategy, and in an achievement oriented world a person with high fear of success is less likely to strive for success and less likely to benefit from the achievement of success.

Zuckerman and Allison (1976) reported that subjects—both males and females with high fear of success perform worse on an anagram task and attributed success more to external factors and failure more to internal factors than did subjects with low fear of success.

Sherman (1983) in her study of fear of success in girls on mathematical concept test found that girls were more oriented towards affective goals rather than achievement and many admitted to playing dumb in response to heterosexual social situation. Condry and Dyer (1974) and Shapiro (1979) suggested that fear of success may be conceptualized as a fear of deviance from sex-role standards. Gravenkemper and Paludi (1983) suggested that the interference of fear of success with performance may occur in situations in which this motive was aroused, i.e., when achievement of success required 'masculine' qualities such as aggressiveness, competitiveness and ambition. In a recent study, Ohri and Malhotra (1988) found that women with low fear of success performed better than high fear of success women on horse trading, gold chain and train problem.
The present trend that low fear of success group is performing better than the high fear of success group, can be explained by the fact that high fear of success women have anxiety about success due to fear of negative consequences of success. These negative consequences may be social rejection or loss of femininity. To avoid these negative consequences women with high fear of success tend to lower their performance, play dumb, avoid achievement oriented situations or attribute their success to some external factors. Particularly, as far as problem solving situation is concerned, where problems were administered individually. The high fear of success group might have suffered in performance because of the situational anxiety in a testing situation.

**Personality x Fear of Success:**

In the present investigation the interactive effect of personality x fear of success on prisoner's problem is found significant at .01 level and .05 level for trials and time taken respectively (For F-ratios, see ANOVA Tables XIII and XIV). The means contingency table (see Table XIV) and the graph (see Figures Xa, Xb, Xc and Xd) indicate that the stable group with low fear of success is giving the best performance on both trials and time taken, whereas, the neurotics with high fear of success as well as low fear of
success are showing the poorest performance. This indicates that high fear of success is debilitating the performance of stables, whereas, high fear of success produces almost no effect upon the already poor performance of neurotics. The trend in the two interactions for trials and time taken is similar.

The present results are not in accordance with the hypothesis framed earlier where it was hypothesized that fear of success coupled with high neurotism may hinder the performance of women irrespective of their working status. In the present results it is found that high fear of success is detrimental for the performance even when coupled with stability.

The obtained significant interaction between personality x fear of success may be explained through the fact that high fear of success elicits success anxiety in stables and hence hinders their performance. In neurotics, who are already anxious about task outcomes, the success anxiety may also serve the same purpose and hence may be meaningless for them. Therefore, there is no difference between the performance of neurotics with high fear of success and low fear of success as is reflected in insignificant t-values.
**Induced Motivation and Problem Solving:**

The results on the variable of induced motivation indicate that the ego-oriented instructions are facilitating the performance of subjects as compared to task-oriented instructions. The results on the variable of induced motivation for the combined scores of first three problems indicate that ego-oriented group is performing significantly better than the task oriented group ($F = 4.94, P < 0.05$). For means see Table IV and for F-ratio see Table VI.

The results on Bhatia squares problem and prisoner's problem on time taken to solve these two problems also indicate the superiority of ego-oriented instructional group over task oriented group. F-ratios being significance at .01 level for time taken to solve Bhatia squares and at .05 level for time taken to solve prisoner's problem (see Table IX and XIV). The mean differences between the two motivational groups on anagrams problem solving task were not significant although the trend was in the favour of ego-oriented group (see Table V).

These results are in accordance with the hypothesis framed earlier where it was hypothesized that women receiving induced motivation in the form of ego-oriented instructions and verbal persuasion may perform better than the women receiving task oriented instructions (see p.98).
Some direct and indirect evidence has accumulated to support the present results. In the area of problem solving induced motivation has been found to produce facilitative effects on performance. Leibowitz (1966) in his study on value symbols has shown the positive effect of motivation upon problem solving. Alper (1946) compared the learning and retention of non-sense syllables and digits when the learning task was presented as measuring intellectual ability (ego-involvement) and when it was not. The ego-involved subjects showed no loss of retention in over twenty four hours, whereas, the control subjects did. Feldman (1964) showed that high drive group was superior to low drive group in psychomotor performance. Mohan, J. (1966) also showed that high motivation (experimentally induced) group was better than low motivation group on reminiscence.

French and Lesser (1965) had found that females would respond to arousal cues with heightened achievement motivation scores and high motivated performance relationship, when the goal was achievement oriented for them, but not otherwise. Angelini (1966) found that Brazilian College women showed increase in n-ach under achievement oriented instructions.

Kumar (1975) in his study on variety of problem solving tasks found that induced motivation presented in the form of ego-involving instructions facilitates the performance of subjects. Kumar (1983) found that ego-involving instruction:
brought the performance of women at par with men.

Sandelands et al. (1988) found that subjects in high involvement condition, produced by instructing the subjects that the task is an indicator of ability attempted more anagrams than subjects in low involvement conditions, produced by giving only task instructions.

The following explanation may be offered for the results of the present investigation indicating better performance of motivationally instructed group.

1. Ego-involving instructions may have motivational consequences and thus produce increments in performance. As Brown (1961) suggested that, verbal instructions are stimuli, which like electric shock and noise may have motivational consequences.

2. Sherif and Sherif (1967) suggested that 'ego attitudes' and their involvement give a pattern of personal consistency to the individual's behaviour. When the stability is disturbed 'ego tension' arises. When these 'ego-tensions' are caused by failure or threat of failure, anxiety germinates. This anxiety which is the anticipation of painful consequences, serves as a motivating state. It energizes the individual to restore consistency and balance.
3. Ego-involving instructions or telling the subjects that task is a test of their ability can enhance their 'effectence' which according to Connell (1988) is a need which impels the organism toward competence and is satisfied by the feeling of efficacy. Self perceptions of competence promotes subsequent interest in an activity (White, 1959; Lepper, 1981; Deciand Ryan, 1985; and Bandura, 1986) and hence increases performance. Harackiewicz, Abrahams and Wageman (1987) suggested that it should be possible to affect intrinsic motivation with external communications and incentives which make people feel competent. Therefore, ego-involving instructions may serve this purpose and enhance persons's effort on the task and hence improve their performance.

4. It has been postulated that arousal and performance are related by inverted U-function (Yerkes and Dodson, 1908) and that individuals will seek to maintain an optimal arousal level. On this basis Wayne (1988) postulated that other things being equal, the performance of low arousal subjects can be enhanced by increasing their arousal levels through application of appropriate motivation in the form of instructions. Therefore, it is expected that ego-involving instructions may improve the performance of subjects with low arousal only.
which can best be appreciated through an interaction of autonomic arousal and induced instructions to internal and external drive.

**Personality x Motivation:**

The interaction effect of personality x motivation has been found significant at .01 level for both trials and time taken to solve Bhatia squares (For F-ratios, see Tables VIII and IX). The means, contingency table (see Table X) and the plotted curve (see Figures VIIa, VIIb, VIIc and VIIId) indicate that induced motivation is hindering the performance of neurotics by increasing the number of trials taken to solve the Bhatia squares problem. The t-ratio for the differences between the means of neurotics under motivational instructions and task oriented instructions is significant at .01 level (see Table X) for trials taken. Similarly the time taken by the neurotics to solve Bhatia squares problem solving task also increased after receiving ego-oriented instructions, although the mean differences failed to reach the level of significance. On the other hand ego-oriented instructions improved the performance of stables by taking lesser number of trials and time taken by them to solve Bhatia squares (The t-ratios for
stables for both trials and time taken are significant at .01 level).

The present results regarding the significant interactions may be explained by the fact that neurotics are already aroused and motivational instructions further lead to over arousal, hence a hinderance in performance. As according to Yerkes-Dodson Law (Yerkes and Dodson, 1908) only moderate levels of arousal are optimal for successful performance.

The debilitating effect of drive may also be due to the fact that drive may lead to stress which leads to impairment in performance (Lazarus, Deese and Osler, 1952). This stress may be magnified when coupled with certain personality types (Kumar, 1975). Therefore, the results of the present investigation indicate that drive coupled with neuroticism leads to stress and hence hinder performance.

**Fear of Success x Motivation:**

The interactions between fear of success x induced motivation are found significant at .01 level for trials taken to solve Bhatia squares and for trials and time taken to solve prisoner's problem (For F-ratios, see Tables VIII, XIII and XIV). Means contingency table for the said
interaction for Bhatia squares problem solving task (see Table XI) and the plotted graph (see Figures VIIIa and VIIIb) indicate that induced motivation hinders the performance of high fear of success group and facilitates the performance of low fear of success group.

Similarly, fear of success x motivation interactions for trials and time taken to solve prisoner's problem indicate that ego-oriented instructions are hindering the performance of high fear of success group and facilitating the performance of low fear of success group (see Table XVI and Figures XIa, XIb, XIC and XId). Means contingency table (see Table XVI) shows that ego-oriented instructions hinder the performance of high fear of success group by increasing the number of trials and time taken to solve prisoner's problem, though for time taken the mean differences failed to reach the desired level of significance.

This fear of success x motivation interaction may be explained by the fact that ego-involving instructions should only enhance interest when people care about doing well. Achievement oriented individuals show strong interest in diagnostic ability assessment (Troepe, 1975) and become involved in activities where performance is evaluated (Harackiewicz and Manderlink, 1984). Those who are not
achievement oriented (high fear of success subjects), avoid ability assessment when possible and are less likely to value competence (Heckhausen, 1968). This may happen in case of high fear of success individuals, who according to Zuckerman and Allison (1976) have low motivation to achieve. Ohri and Malhotra (1988) also found that induced motivation in the form of ego-oriented instructions is debilitating for the performance of women at high fear of success level.

**Personality x Working Status:**

The interaction between personality x working status was found to be significant at .05 level for time taken to solve Bhatia squares (for F-ratio see Table IX). The means contingency table (see Table XII) and the plotted curve (see Figures IXa and IXb) indicate that university and working women differ significantly in their performance at stability end, whereas, at neurotic end their is no difference in the performance of two groups of women. At stability end university women are performing significantly better than the working women (t = 2.03, P < .05). This interaction may be explained by the fact that university women are having higher stability scores than working women. It was found that mean stability score for working women was 4.95
and mean stability score* for university women was 3.87 and the mean difference was significant at .01 level (t = 4.38, P < .01). And it is already clear that stability helps to boost the performance. Hence, the higher stability scores of university women are responsible for their better performance as compared to working women at stability end. The poorer performance of working women may be due to the anxiety associated with role overload, role conflict, uncertainty, insecurity and other factors due to the duality of the role played by them. Dual role expectation can increase inter-role conflict (Katz and Kahn, 1978) or can lead to increase in overall work load (Hall and Hall, 1982). Robalind and Grace (1985) also suggested that dual roles of working women lead to work-family conflict and employment acts as a catalyst for feelings of role overload, role conflict and hence for psychological distress and anxiety.

**Motivation x Working Status:**

The interaction between motivation x working status is found to be significant at .05 level for the combined

*Lower score on Neuroticism-Stability dimension indicates higher stability.*
scores of first three problems (for F-ratio see Table VI). The means contingency table (see Table VI) and the plotted curve (see Figures VIA and VIb) indicate that ego-oriented instructions are boosting the performance of university women. Whereas, ego-oriented instructions are producing no effect on the performance of working women.

This interaction may be explained by the fact that university women are still living in an achievement oriented world where competitive and evaluative situations are expected to be normal for them. They are being trained to be competitive. Therefore, when they are told that the given task is a test of their ability, they may put a greater effort into the task to enhance their sense of competence. Whereas, for working women who are facing social realities the achievement oriented situations may not be seen as of great importance and, therefore, ego-oriented instructions may produce lesser effect on the performance of working women. Therefore, the performance of working women remain steady under both the conditions of verbal instructions, whereas, the university women are benefitted by induced instructions.

**Personality x Fear of Success x Induced Motivation:**

The three way interaction of personality x fear of success x induced motivation was found to be significant.
at .05 level on time taken to solve prisoner's problem (for F-ratio see Table XIV). The means contingency Table (see Table XVII) and the graph (see Figure VIII) indicate that instructions have differential effects on neurotics and stables when coupled with fear of success. Ego-oriented instructions significantly improve the performance of stables with low fear of success and produce no significant effect upon the performance of stables and neurotics at high fear of success level, and in case of neurotics at the low fear of success. Thus ego-oriented instructions coupled with low fear of success significantly improve the performance of stables in nut shell. These results can be explained by the fact that motivating instructions help to enhance the performance of low arousal subjects (Wayne, 1988) only at low fear of success level because low fear of success individuals (achievement oriented individuals) show strong interest in diagnostic ability assessment, (Trope, 1975) and become involved in activities where performance is evaluated (Harackiewicz and Manderlink, 1984). Whereas, ego-oriented instructions may have no meaning for high fear of success subjects (low achievement oriented), and neurotics who are already having high arousal levels but has a significant meaning for
stables and low fear of success subjects because instructions help them to reach the optimal level of stimulation required for the task.