Abstract

This study examined the “impact of academic stress and hardiness on achievement motivation and problem solving behavior of adolescents”. Adolescence is popularly described as a time of heightened egocentrism, volatility and experimentation with risky behaviors. Close emotional ties to parents are challenged, as adolescents begin to exercise their independence and individuality. By their very nature, adolescents involve many physiological, psychological, social and cognitive changes. These changes include formation of personal identity, the establishment of new networks, and a general orientation toward self and world. College students, especially freshmen, are particularly prone to stress due to the transitional nature of college life. Academic problems have been reported to be the most important sources of stress among adolescents. Academic stress hinders optimal performance of students. This stress (academic stress) is a common risk factor that heightens student’s anxiety levels (Leung, Yeung & Wong 2009), and adversely affects their health and psychological well-being (Fields & Prinz 1997).

Academic stressors include the student’s perception of the extensive knowledge base required and the perception of an inadequate time to develop it (Carveth, Gesse, & Moss 1996). Students report experiencing academic stress at predictable times each semester with the greatest sources of academic stress resulting from taking and studying for exams, grade competition, and the large amount of content to master in a small amount of time (Abouserie, 1994; Archer & Lamnin, 1985; Britton & Tesser, 1991; Kohn & Frazer 1986).

The psychological factors and their effects on academic situations are the growing concerns of educational researches. The personality construct of hardiness, is a set of
beliefs about oneself and the world manifested as commitment, control, and challenge. Hardiness protects against stress in two ways; one by altering perceptions of stress and the other by mobilizing effective coping strategies. Hardiness transforms difficult life events into opportunities for increased meaning in life (Schwab, 1996).

Hardy individuals are active and goal-oriented, and approach life with interest and excitement (Rowe, 1999). They exhibit a belief that stressors are changeable and that they can influence what is going on around them with a willingness to act on the belief (control). Hardy individuals possess a deep involvement in life’s activities and the knack of finding something interesting or important about whatever it is they are doing (commitment). They have a tendency to view changes, pressures and disruptions, however painful, as something to be learned from and grow with (challenge) (Khoshaba & Maddi, 1999).

The need for success or the attainment of excellence is a highly acceptable behavior of adolescents that represents achievement motivation of adolescents. McClelland et al. (1953), define achievement motivation as ‘a competition with a standard of excellence’. Thus, the need-achievement is characterized by a desire to attain a high standard of excellence and to accomplish the unique objective. In such a situation, a subject shows concern with competition with a standard of excellence. Therefore, achievement motivation can be defined as a concern for excellence in performance as reflected in competition with the standards set by others or over unique accomplishment or long time involvement (McClelland, 1953). Achievement motivation in is involved competition with a particular standard of the excellence of performance and influences learning and personality development of an individual. Pupils with high achievement
motivation are self confident individuals who function well in situations where they assume personal responsibility and can control what happens to them. They set challenging but realistic goals demanding maximum efforts. They are neither satisfied with automatic success that comes from easy goals nor do they try to do impossible tasks.

Problems are involved in the daily life of everyone, including the students. The area of thinking and problem solving were primarily concerned with understanding what goes on in the mind of the subject between presentation of a problem and attainment of its solution. Problem solving was defined as a higher-order cognitive process that required the modulation and control of more routine or fundamental skills. It occurs if an organism or an artificial intelligence system does not know how to proceed from a given state to a desired goal state. It is part of the larger problem process that includes problem finding and problem shaping (Rappaport & Seidman, 2000; Lazarus & Folkman, 1984; University of South Australia, 2009), or solving a problem was defined in the sense of making it go away, then the problem no longer exists. This indeed is one kind of solution, but it is not the only kind (Harris, 1998).

The following main research objectives were systematically designed:

1. To examine the main effects of levels of academic stress (low and high), stream (science and social science) and gender (boys and girls) and the interaction between them on the overall scorers of achievement motivation.

2. To examine the main effects of levels of academic stress (low and high), stream (science and social science) and gender (boys and girls) and the interaction between them on the overall scorers of problem solving.
3. To examine the main effects of levels of hardiness (low and high), stream (science and social science) and gender (boys and girls) and the interaction between them on the overall scorers of achievement motivation.

4. To examine the main effects of levels of hardiness (low and high), stream (science and social science) and gender (boys and girls) and the interaction between them on the overall scorers of problem solving.

5. To determine the psychometric properties of academic stress scale.

A total number of 400 students were selected on the basis of purposive random sample for the present study. The sample was divided on the basis of science and social science streams. Out of the 400 students, there were 200 students for science (100 boys & 100 girls) and 200 students for social science (100 boys & 100 girls) stream. Students were selected from Senior Secondary School (Boys section) of Aligarh Muslim University, Aligarh, U.P. and Aligarh Public School, Aligarh, U.P. Subjects were further classified on the basis of scores obtained on the Students Stress Scale (SSS) and Hardiness Scale (HS). Subjects who obtained scores below 74 were categorized as low academic stress and subjects who scored more than 94 were categorized as high academic stress cases. 94 subjects were identified as low academic stress cases subjects and 97 subjects were identified as high academic stress. Similarly, subjects were categorized as high and low in hardiness, on the basis of scores obtained on Hardiness Scale. Low hardy subjects scored in the range from 84 to 98. Based on this, 91 subjects were identified as low hardy, and the high hardy subjects scored in the range from 111 to 134. Based on
this, 85 subjects were identified as high hardy. The age range of all the subjects was from 15 to 17 years.

In the present study, four scales, namely, Student Stress Scale (SSS), Hardiness Scale (HS), Achievement Motivation Scale (AMS) and Problem Solving Ability Test (PSAT) were used.

**Development of Student Stress Scale (SSS)**

This scale was developed by Husain, Rashid and Jahan (2001). The SSS comprised 57 items which measure sources of academic stress among students. There are four alternative response categories ranging from ‘No Stress at all’ to ‘Extreme Stress’. Scores range from 0 to 3. The principal component analysis of SSS was done by the present investigator. Factor analyses of the 57 items produced a five-factor structure. Finally 36 items were selected which represent the five factors. Each factor consisted of five or more items. The numbers of items representing the 5 factors are as: (I) Inadequate academic environment in the college (item nos. 1, 5, 12, 21, 30, 34, 43, 51, 57), (II) Lack of adjustment (item nos. 9, 11, 14, 16, 24, 26, 39, 52), (III) Apprehensive about the future (item nos. 2, 15, 18, 19, 22, 28, 46), (IV) Poor administration (item nos. 3, 4, 7, 10, 17, 29) and (V) Worries (item nos. 25, 37, 41, 47, 49, 50).

The resulting five factor scores were intercorrelated with each other in the students sample. Cronbach’s Alpha of SSS of present sample was found to be 0.829.

**Hardiness Scale (HS)**

The short version of Hardiness Scale (HS) developed by Kobasa and Maddi (1982) was used to measure the level of hardiness of the students. The scale comprised 36 items and it measures three components (i.e. Commitment, Control and Challenge). The
responses of the subjects on Hardiness Scale were obtained on four-point scale ranging from ‘Not at all’ to ‘Completely true’. The response categories were assigned scores of 1, 2, 3 and 4 respectively.

The short form of control scale contains both 4-points and 2-points response items. The simple summation of these items results in the overweighing of the 4-point item. Therefore, to avoid the confusion the responses to items of the control scale were coded to have the same range as items from the other scales. That is, the subject either received ‘1’ or ‘4’ for their responses to this scale thereafter; the raw scores on the subscales were converted into Z scores. The items on the scale are negatively keyed. Subjects whose scores fell below Q1 were identified as low hardy and subjects whose scores fell above Q3 were categorized as high hardy.

**Achievement Motivation Scale (AMS)**

Achievement Motivation Scale was constructed and standardized by Shah (1986). The AMS based on forced-choice contains 40 items distributed over four dimensions i.e. as (a) Need for academic success (item Nos.2,3,11,14,18,21,26,31,37,40), (b) Need for vocational achievement (item Nos. 1,5,9,13,16,17,19,20,33,36), (c) Need for social achievement (item Nos.4,7,12,15,22,23,27,34,38,39) and (d) Need for skill achievement (item Nos. 6,8,10,24,25,28,29,30,32,35). Each statement is followed by three alternative responses. The alternatives are arranged in order to one’s inclination towards achievements in the areas of academic, vocation, social context and skills. Weightage 1, 2 and 3 were awarded for alternatives (a), (b) & (c) respectively, on all statements.
Problem Solving Ability Test (PSAT)

Problem Solving Ability Test (PSAT) was constructed and standardized by Garg (1982). This test has been prescribed to assess the level of intelligence of the students. Items have been selected after careful examination of available test of problem solving inventories, rating test and intelligence test etc., including mathematical puzzles, problems concerned with general knowledge and series tests. This test consisted of 22 problems along-with alternative answers, (except item No.2 and 20) in which only one answer is correct. Subject who wrote the correct answer was awarded one mark and for the wrong answer zero was given. The maximum marks a subject obtained on the PSAT were 22.

Personal data sheet included information related to name, age, gender, class and streams of the subjects.

The investigator established rapport with the students and requested them to participate voluntarily and to cooperate in the data collection process. The purpose of the data collection was explained to the students of the said schools and they were assured that their responses would be kept strictly confidential and would be utilized for the research purpose only. The data was collected in small groups ranging from 10 to 20 students in the classrooms. All four questionnaires were given to the students and sufficient time was given to them to complete the questionnaires. These questionnaires were administered in two settings. The data was analyzed with the help of three-way ANOVA (Analysis of Variance).
The major findings of the present study are as follows:

- There were no significant main effects of academic stress (low and high), streams (science and social science) and gender (boys and girls) on achievement motivation of adolescents.

- There were significant main effects of academic stress (low and high) and gender (boys and girls) on problem solving scores. The streams (science and social science) did not have significant main effect on problem solving. The two-way interaction effect between stream and gender was found significant whereas three-way interaction between academic stress, stream and gender was found nonsignificant.

- There was a significant main effect of hardiness (low hardy and high hardy) on achievement motivation. The two-way interaction effect between stream and gender was also found significant on achievement motivation.

- Results also indicated that there were significant main effects of hardiness (low hardy and high hardy), and gender (boys and girls) on problem solving, whereas there was no significant main effect of stream (science and social science) on problem solving behavior of adolescents. Two-way interactions between hardiness and stream, and hardiness and gender were also found to be statistically significant. Three-way interaction between hardiness, stream and gender was not found to be significant.