The main objective of the present study is to explore the relationship of creative thinking of adolescents with academic achievement, test anxiety, extraversion and neuroticism. A sample of 300 class IX students has been drawn from seven randomly selected schools of Hamirpur district of Himachal Pradesh. Verbal test of Creative Thinking, Test Anxiety Scale and Personality Inventory were administered to the students. The data has been analyzed using the technique of "Correlation" and significance of coefficients of correlation was tested by computing t-values. The study revealed that adolescents having high academic achievement are more creative than the adolescents having low academic achievement. Test Anxiety has been found negatively and significantly related with creativity. Extraversion and neuroticism have been found to have negative but not significant relationship with creativity.

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The phenomenon of creativity is so complex and multidimensional that it has proved to be one of the most troublesome concepts in the literature of measurement with no universally accepted definition. Guilford has been a staunch exponent of cognitive functioning in defining creativity. In his model of 'Structure of Intellect', he has emphasized creativity as an individual's ability of generation of information from the given information where the emphasis is upon variety of output from the same source i.e. innovation, originality, unusual synthesis or perspective (444-454). Wilson et al. on the same lines worked out similar factors-fluency, flexibility, originality, elaboration and redefinition components of creativity.

The creative potential is mostly defined by estimation, one of the cognitive abilities - divergent thinking. Divergent thinking is the ability to generate a number of alternative decisions of problem solving. The main parameters of divergent thinking are fluency and the ability to generate new and useful ideas as many as possible (Grakauskaite-Karkockiene, 66-67). However, many thinkers point out that divergent thinking is only a part of creativity and should not be treated as equivalent of creativity.

Kneller and Kozbelt et al. have proposed that creativity can be best defined in terms of product, process, person and press. They advocate that no single definition is sufficient to provide its cohesive comprehensive definition and global interpretation. However, Lehois tries to combine the four strands by defining creativity as a complex human attribute that is manifested as a cognitive empirical process from which an original product emerges.

Many studies have been conducted to explore the variables, cognitive and non-cognitive that are related to creative thinking. The present study has been undertaken to find out the relationship of academic achievement, test anxiety, extraversion and neuroticism with creative thinking.

Creativity has been found to be significantly related with academic achievement by Struthers et al. (1996), Mahmodi (1998), Karimi (2000) whereas Xiaoxia (1999) reports that creativity is rarely related to academic achievement and Nori (2002) finds no significant relationship between the two.

Test anxiety is found to be negatively and significantly related with verbal, non-verbal and total creative thinking by Singh (1981). Santhana and Krishnan (1990) find that low anxiety subjects secure the maximum mean score of verbal creativity whereas Badola finds that there is a positive and significant relationship between creativity and anxiety.
Creativity has also been studied with extraversion and neuroticism by Wolfradt and Pretz and they observed that more creative individuals were characterized by emotional stability and extraversion (297-310). Batey and Furnham,(355-429) also find that extraversion is positively related to creativity whereas Silvia et al.(68-85) report that divergent thinking is not related to traits of extraversion and neuroticism.

Objectives

- To study the relationship between creative thinking and academic achievement of adolescents.
- To study the relationship between creative thinking and test anxiety of adolescents.
- To study the relationship between creative thinking and extraversion of adolescents.
- To study the relationship between creative thinking and neuroticism of adolescents.
Hypotheses

- There will be positive and significant relationship between creative thinking and academic achievement of adolescents.
- There will be no significant relationship between creative thinking and test anxiety of adolescents.
- There will be no significant relationship between creative thinking and extraversion of adolescents.
- There will be no significant relationship between creative thinking and neuroticism of adolescents.

Method and Procedure

Sample

A sample of 300 class IX students has been drawn from seven randomly selected schools of Hamirpur District of Himachal Pradesh.

Tools

Following tools have been used in the present study:

2. The Indian adaption of Test Anxiety Scale for Children by Dr. A. Kumar (1971).

Analysis of Data

Verbal test of creative thinking was scored for verbal fluency, verbal flexibility, verbal originality and total verbal creativity. The academic achievement scores of the students were noted from the school records of the students. Scores of the students on test anxiety scale and personality inventory were also obtained.

To analyze the data the technique of 'Correlation' has been employed and significance of the co-efficient of correlation tested by computing the t-values following the formula given by Guilford and Fruchter (1978).

The coefficients of correlation of academic achievement, test anxiety, extraversion and neuroticism with fluency (F), flexibility (X), originality (O) and composite creativity (CCS) score along with t-values are given in Table-1.
### Table-I

Co-efficient of Correlation and t-values of Academic Achievement, Test Anxiety, Extraversion and Neuroticism with Fluency (F), Flexibility (x), Originality (o) and Composite Creativity Score (CCS)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Independent Variables</th>
<th>Dependent Variables</th>
<th>F</th>
<th>X</th>
<th>O</th>
<th>CCS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>r</td>
<td>0.273</td>
<td>0.347</td>
<td>0.378</td>
<td>0.374</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t</td>
<td>4.90**</td>
<td>6.40**</td>
<td>7.05**</td>
<td>6.96**</td>
</tr>
<tr>
<td>1</td>
<td>Academic Achievement</td>
<td>r</td>
<td>-0.171</td>
<td>-0.175</td>
<td>-0.068</td>
<td>-0.155</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t</td>
<td>-3.00**</td>
<td>-3.07**</td>
<td>1.18</td>
<td>-2.72**</td>
</tr>
<tr>
<td>2</td>
<td>Test Anxiety</td>
<td>r</td>
<td>-0.005</td>
<td>-0.056</td>
<td>-0.015</td>
<td>-0.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t</td>
<td>-0.10</td>
<td>-0.96</td>
<td>0.26</td>
<td>-0.49</td>
</tr>
<tr>
<td>3</td>
<td>Extraversion</td>
<td>r</td>
<td>-0.138</td>
<td>-0.142</td>
<td>-0.016</td>
<td>-0.099</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t</td>
<td>-2.41*</td>
<td>-2.48*</td>
<td>0.28</td>
<td>-1.72</td>
</tr>
<tr>
<td>4</td>
<td>Neuroticism</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>t</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


* Significant at 0.05 level
** Significant at 0.01 level.
Results and Discussion

Table-1 shows that coefficients of correlation of academic achievement with fluency, flexibility, originality and composite creativity score are 0.273, 0.347, 0.378 and 0.374 respectively. The t-value in each case came out to be significant even at 0.01 level. This means that all the dimensions of creative thinking namely, fluency, flexibility, originality and total creativity have significant and positive correlation with academic achievement of students. It means that adolescents having high academic achievement are more creative than the students having low academic achievement.

It is worth mentioning that the finding of the present study i.e. academic achievement is positively and significantly related with different dimensions(fluency, flexibility, originality and total creativity)of creative thinking is in line with the studies conducted by Struthers, et al. (1996), Mahmodi (1998) and Karimi (2000) which also indicate the positive correlation between creativity and academic achievement. However, the results are in contradiction with the results of Xiaoxia (1999) and Nori (2002).

It is further evident from the Table-1 that the coefficients of correlation of test anxiety with fluency, flexibility, originality and total creativity score are -0.171, -0.175, -0.068 and -0.155 respectively. The t-values are significant in all the dimensions of creativity except originality. These dimensions are negatively and significantly related with test anxiety, indicating that the students with high test anxiety have low creative scores whereas students with low test anxiety have high creative scores.

The result is in accordance with some of the previous findings by Singh (1981), Santhana and Krishnan (1990) who reported negative correlation between test anxiety and creativity. However the result is in contradiction with the result of Badola (1991) who finds positive and significant relationship between the two.

The t-values for coefficients of correlation of extraversion with all the dimensions of verbal creative thinking i.e. fluency, flexibility, originality and total creativity are -0.10, -0.96, -0.26 and -0.49 respectively. None of these are significant even at 0.05 level of significance. This indicates that the trait of extraversion is not related with the dimensions of creative thinking significantly. But negative direction of correlation suggests that introverts tend to be more creative than extrovert. The result is in contradiction with the previous result of Wolfradt and Pretz (2001), Batey and Furnham (2006) who find extraversion positively related with creativity.
Table-1 further reveals that t-values for coefficients of correlation of neuroticism with verbal-fluency and flexibility are -2.41 and -2.48 respectively, which are significant at 0.05 level, showing that neuroticism is significantly and negatively related with fluency and flexibility of adolescents. This indicates that emotionally stable adolescents are more fluent and flexible than those having neurotic tendencies.

The findings are in line with the study of Wolfradt & Pretz (2001) who find that more creative individuals are characterized by emotional stability. However, the results are in contradiction with the result of Silvia et al. (2006) who reports that divergent thinking is not related to neuroticism.

Conclusions

In view of the foregoing discussion, following conclusions appear tenable:

- Academic achievement is found to be positively and significantly related with the measures of verbal creative thinking i.e. fluency, flexibility, originality and composite creativity of adolescents. It means that adolescents having high academic achievement are more creative than those who possess low academic achievement.

- Test anxiety is found to be negatively and significantly related with verbal-fluency, flexibility, and total creativity which means adolescents with high test anxiety have low creative scores whereas students with low test anxiety have high creative scores.

- Extraversion is found to have negative but not significant relationship with the dimensions of verbal creative thinking i.e. fluency, flexibility, originality and total creativity of adolescents. The negative direction of correlation suggests that introverts tend to be more creative than extroverts.

- The negative and significant relationship of neuroticism with verbal fluency and flexibility of adolescents suggests that emotionally stable students are more fluent and flexible than those having neurotic tendencies.
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