

# Intelligence and Divergent Thinking Abilities of Senior Secondary Students: A Co-relational Study

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## ABSTRACT

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This study aimed at finding out relationship between Intelligence and divergent abilities of Senior Secondary Students. A sample of 120 students were selected randomly from the various schools of Rohtak Dist. of Haryana State. For the study, Thinking Creatively by Words (TCW) developed by Dr. Baquer Mehndi and Intelligence Group Test of Mental Ability developed by Dr. S.S. Jalota were used for data collection. The result revealed that there is significant relationship between Intelligence and Divergent thinking skills of Senior Secondary Students. The result also revealed that students of Senior secondary schools scored high mean scores in divergent thinking skills than intelligence.

**Keywords:** Intelligence, divergent thinking abilities

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## Intelligence

Intelligence is the aggregate capacity of individual to act purposefully, to think rationally and to deal effectively with his/her environment. It can be called as the capacity to acquire knowledge. In order to solve any problem, knowledge should be applied in the right manner with the help of intelligence. Educationists consider intelligence as the mental ability which helps the individual to think about minute, complex and abstract matters, to adjust with changing situations by solving various problems as quickly as possible, to acquire with ease knowledge, proficiency and aptitude in different subjects, to explain new situations with the help of prior experience, to arrive at conclusions by determining the exact relations between various elements, to utilize our energy by keeping the emotions and impulse under control whenever necessary in achieving the goal. Man, however, has surpassed other creatures in the development of brain and this development has made him superior to other species in his behavior and in control of his environment. But it is well-known fact to us all, that the individuals have different

capabilities to adapt and change this environment. One thinks differently from the other. He solves the problems concerning to his environment and to overcome the hurdles in the way of his progress, and in paving new paths of his progress quickly than this fellows. One feels it very difficult to adjust with his peers while the others are very efficient in doing. So, thus, it can be said that a person's intelligence manifests itself through different activities and not through a particular activity (Gupta and Basu, 2006.)

## **Divergent thinking**

It is a thought process or method used to generate creative ideas by exploring many possible solutions. It is often used in conjunction with its cognitive opposite, convergent thinking, which follows a particular set of logical steps to arrive at one solution, which in some cases is a 'correct' solution. By contrast, divergent thinking typically occurs in a spontaneous, free-flowing, 'non-linear' manner, such that many ideas are generated in an emergent cognitive fashion. Many possible solutions are explored in a short amount of time, and unexpected connections are drawn. After the process of divergent thinking has been completed, ideas and information are organized and structured using convergent thinking (Torrance, 1962).

Developing one's divergent thinking skills is thought to enhance creativity. Creativity can be seen as an ability to retrieve and connect disparate concepts stored in long-term memory systems. Concepts are connected in our brains in 'semantic networks'. Psychologists have proposed that individual differences in creativity are due to differences in whether associative networks were 'steep' or 'flat'- those with 'flat' networks have numerous and loose conceptual connections, enabling them to be more creative. Those with 'steep' networks tend to have more logical, linear associations between nodes. Someone with a flat network quickly and creatively hops – node to node – something someone 'linear' in their thinking would struggle with.

## **Intelligence and Divergent Thinking Abilities**

The relationship between creativity and intelligence has been matter of considerable of the two is done critically, one must reach at the conclusion that the two are both originating from the same domain and have almost similar explanation in their theories and hence should have a close relationship. In this regard many researches had been done on school children and others. Many research findings and observations have demonstrated that there is no positive correlation between creativity and intelligence. One is not the essential or necessary prerequisite of the other. Those found scoring high on intelligence tests might demonstrate no signs of creativity where as individuals performing poorly in intelligence tests may sometimes create something very original. Therefore, no clear relationship has been seen to exist between intelligence and creativity. Evidence from attempts to look at correlations between intelligence and creativity from the 1950s onwards, by authors such as Barron, Guilford or Wallach and Kogan, regularly suggested that correlations between these concepts were low enough to justify treating them as distinct concepts. Some researchers believe that creativity is the outcome of the same cognitive processes as intelligence, and is only judged as creativity in terms of its consequences, i.e.

when the outcome of cognitive processes happens to produce something novel, a view which Perkins has termed the “nothing special” hypothesis.

### **Need of the study**

The importance of creativity in the scientific age itself is contributory to accelerate the pace of research activity. New inventions and discoveries whether be in science, agricultural field, in communication, transport or making forecast and predictions- all are the result of creative efforts of man. But no doubt, a little human machinery, which is known as Brain having intellect is responsible for all these achievements. Intelligence is closely related to intellect. Intellect includes observing, understanding, thinking, remembering and all ways of knowing. Both intelligent and creativity are the important cognitive aspects of the individual. The bewildering or puzzling rapid change in the present nuclear and space age has increasingly enhanced the important of the creative talent and alerted the educationists and psychologists from their slumberous state work on searching our new methods, strategies and techniques for its identification and development. This study will explore the conditions for facilitating the creativity prevailing in government schools of Rohtak Dist. of Haryana state. The main focus of this research will be to explore the relation between divergent thinking skills and Intelligence (cognitive abilities).

### **Objectives of the study**

- To compare the intelligence and divergent thinking abilities of male students of senior secondary schools of rural areas.
- To compare the intelligence and divergent thinking abilities of female students of senior secondary schools of rural areas.
- To compare the intelligence and divergent thinking abilities of male students of senior secondary schools of urban areas.
- To compare the intelligence and divergent thinking abilities of female students of senior secondary schools of urban areas.
- To find the relationship between intelligence and divergent thinking abilities of the senior secondary students.

### **Hypothesis of the study**

- There is no significant difference between the intelligence and divergent thinking abilities scores of male students of senior secondary schools of rural areas.
- There is no significant difference between the intelligence and divergent thinking abilities scores of female students of senior secondary schools of rural areas.

- There is no significant difference between the intelligence and divergent thinking abilities scores of male students of senior secondary schools of urban areas.
- There is no significant difference between the intelligence and divergent thinking abilities scores of female students of senior secondary schools of urban areas.
- There is no significant relationship between intelligence and divergent thinking abilities scores of senior secondary students.

### Methodology of the study

The study employed descriptive survey method of research. It is commonly used in educational research to study existing conditions and phenomenon. The terms descriptive survey is generally used for the type of research which purposes to certain what are the normal or typical conditions of practice of present time.

### Sample

The sample for this study consisted of 120 (male 60, female 60 ) students who are studying in the Senior Secondary Schools of the Rohtak Dist. of Haryana State. The stratified random sampling technique was adopted for the sample selection and than they were categorized under gender and area.

### Tool Used

For the study Thinking Creatively by Words (TCW) Dr. Baquer Mehndi and Intelligence Group Test of Mental Ability Dr. S.S. Jalota were used for data collection.

### Analysis and Interpretation of Data

- ⊙ **To compare the Intelligence and Divergent Thinking abilities of male students of senior secondary schools of rural areas.**

**Table 1:** r- value for difference in Mean Intelligence and Divergent Thinking Abilities scores of Male students of rural areas

Variables	X	SD	r	Level of Significance
Intelligence	123.09	10.28	0.488	0.05 level Significant
Divergent Thinking Abilities	135.6	33.45		

Table 1 shows the intelligence scores (M-123.09, S.D.-10.28) and divergent thinking abilities scores (M-135.6, SD-33.45) respectively, of male students of senior secondary schools of rural areas. The mean

scores of intelligence are less than the divergent thinking abilities scores of male students studying in schools situated in rural areas. The obtained value of correlation of coefficient  $r$  is 0.488 (significant at 0.05 level) shows that there is significant difference in the level of intelligence and divergent thinking abilities of male students of rural areas. It may therefore be concluded that male students of senior secondary schools of rural areas are more creative.

Thus  $H_{01}$ , "There is no significant difference between the intelligence and divergent thinking abilities scores of male students of senior secondary schools of rural areas" is *Rejected*.

⊙ **To compare the intelligence and divergent thinking abilities of female students of senior secondary schools of rural areas.**

**Table 2:**  $r$ - value for difference in Mean Intelligence and Divergent Thinking Abilities scores of Female students of rural areas

Variables	X	SD	r	Level of Significance
Intelligence	106	25.1	0.589	0.05 level Significant
Divergent Thinking Abilities	159.76	39.41		

Table 2 shows the intelligence scores (M-106, S.D.-25.01) and divergent thinking abilities scores (M-159.76, SD-39.41) respectively, of female students of senior secondary schools of rural areas. The mean scores of intelligence are less than the divergent thinking abilities scores of female students studying in schools situated in rural areas. The obtained value of correlation of coefficient  $r$  is 0.589 (significant at 0.05 level) shows that there is significant difference in the level of intelligence and divergent thinking abilities of female students of rural areas. It may therefore be concluded that female students of senior secondary schools of rural areas are more creative than Intelligent.

Thus,  $H_{02}$ , "There is no significant difference between the intelligence and divergent thinking abilities scores of female students of senior secondary schools of rural areas" is *Rejected*.

⊙ **To compare the intelligence and divergent thinking abilities of male students of senior secondary schools of urban areas.**

**Table 3:**  $r$ - value for difference in Mean Intelligence and Divergent Thinking Abilities scores of male students of urban areas

Variables	X	SD	r	Level of Significance
Intelligence	129.41	12.32	0.466	0.05 level Significant
Divergent	141.2	34.51		

Table 3 shows the intelligence scores (M-129, S.D.-12.32) and divergent thinking abilities scores (M-141.2, SD-34.51) respectively, of male students of senior secondary schools of urban areas. The mean scores of intelligence are less than the divergent thinking abilities scores of male students studying in schools situated in urban areas. The obtained value of correlation of coefficient  $r$  is 0.466 (significant at 0.05 level) shows that there is significant difference in the level of intelligence and divergent thinking abilities of male students of urban areas. It may therefore be concluded that male students of senior secondary schools of urban areas are more creative.

Thus,  $H_{03}$ , “There is no significant difference between the intelligence and divergent thinking abilities scores of male students of senior secondary schools of urban areas” is *Rejected*.

⊙ **To compare the intelligence and divergent thinking abilities of female students of senior secondary schools of urban areas.**

**Table 4:**  $r$ - value for difference in Mean Intelligence and Divergent Thinking Abilities scores of Female students of urban areas

Variables	X	SD	r	Level of Significance
Intelligence	107.30	24.60	0.604	0.05 level Significant
Divergent Thinking	168.63	37.32		

Table 4 shows the intelligence scores (M-107.30, S.D.-24.60) and divergent thinking abilities scores (M-168.63, SD-37.32) respectively, of female students of senior secondary schools of urban areas. The mean scores of Intelligence are less than the divergent thinking abilities scores of female students studying in schools situated in urban areas. The obtained value of correlation of coefficient  $r$  is 0.604 (significant at 0.05 level) shows that there is significant difference in the level of intelligence and divergent thinking abilities of female students of urban areas. It may therefore be concluded that female students of senior secondary schools of urban areas are more creative.

Thus  $H_{04}$ , “There is no significant difference between the intelligence and divergent thinking abilities scores of female students of senior secondary schools of urban areas” is *Rejected*.

⊙ **To find the relationship between intelligence and divergent thinking abilities of the senior secondary students.**

**Table 5:** Correlation Coefficient ( $r$ -value) between intelligence and creativity of the senior secondary students

Variables	No. of Students	r	Remarks
Intelligence	60	0.48	Positive Moderate correlation
Divergent Thinking Abilities	60		

Table 5 clearly shows that the co-efficient of correlation between intelligence and creativity of the senior secondary students is 0.48 and which is significant at 0.01 level of significance. So it can be interpreted that intelligence and divergent thinking ability of the senior secondary students is positively correlated. This positive correlation shows that with increase in Intelligence of students, the creativity increases and vice-versa.

So, the hypothesis  $H_{05}$ , “There is no significant relationship between intelligence and divergent thinking ability of the senior secondary students” is *Rejected*.

## CONCLUSION

The study in hand examined the strength of divergent thinking ability among senior secondary school students in relation to intelligence. It shows that creativity is universally widespread and each and every child has some degree of creativity. It is the duty of parents and teachers to provide support for creative development and help the child to understand the divergent thought and to communicate his ideas freely. They should provide conducive experiences and guidance and should recognize the individual’s creative talent. Thinking always influenced by creativity and intellectual abilities of a person, when a student is considered to be creative, he has minimum levels of intelligence. So, it was found that there is relationship between those two parameters that is intelligence and divergent thinking ability.

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