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## A STUDY OF ACADEMIC ACHIEVEMENT AMONG SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR COGNITIVE STYLE

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**Abstract:** The purpose of this study was to examine the academic achievement among secondary school students in relation to their cognitive style. Academic achievement was treated as dependent variable whereas cognitive style was treated as independent variable. Descriptive survey method was used for the present study. Random sampling technique was used to select the sample of 250 secondary students of private schools affiliated to Central Board of School Education (CBSE). Academic achievement of the students was determined on the basis of their previous examination marks. Cognitive Style Inventory (CSI) by Jha (2011) was used to assess cognitive styles among students. Mean, Standard deviation and 't' test were used to analyse the data. The finding of the study revealed that significant difference was found in academic achievement of male and female secondary school students. It was observed that cognitive styles of male and female secondary school students differ significantly. It was also found that academic achievement of secondary school students belonging to Integrated Style vs. Intuitive Style, Integrated style vs. Split style, Integrated Style vs. Systematic Style, Integrated Style vs. Undifferentiated Style, Intuitive Style vs. Split Style, Intuitive Style vs. Undifferentiated Style, Split Style vs. Systematic Style and Systematic Style vs. Undifferentiated Style differ significantly. No significant difference was found in academic achievement of students belonging to Intuitive Style vs. Systematic Style and students belonging to Split Style vs. Undifferentiated Style.

**Key words:** *Academic achievement, Cognitive style, Secondary School Students*

## INTRODUCTION

Each and every child is unique in terms of his/her inherent nature, needs and inborn potentialities. Cognition is an act or process of knowing and a collection of mental processes that includes awareness, perception, reasoning, and judgment. Learning is a primarily cognitive activity; it is likely to be influenced by the styles of learners which they choose while they learn. A cognitive style is one of the dimensions in which an individual differs. It is conceptualized as information processing habits that develop in harmony with underlying personality characteristics. Cognitive styles appear in a form of stable preferences, attitudes or habitual strategies which categorize a person's mode of perceiving, remembering, thinking and problem solving. Cognitive Styles are important because they are learning methods that are appropriate to each individual. Individual differences should be considered as valuable because they are unique features of individuals and personalities. It has been said that there are two common misunderstandings about paying attention to individual differences in instruction. The first misunderstanding is that teaching patterns are fixed and should be carefully applied in order to gain better results. Secondly, we assume that each learner has a particular learning style that does not change or develop (Mokhtarian, 2003).

Various studies have been conducted regarding academic achievement and cognitive style and found that a significant relationship between high school students' & teachers' cognitive styles (field dependence/independence) and students' academic achievement (Mokhtarian, 2003). Samavati (2001) investigated the association between cognitive styles (convergent, divergent, absorptive and adaptive) and locus of control (internal and external). There were meaningful differences among different major groups with regard to cognitive styles. Khodabakhsh (2011) concluded that students' math scores are significantly related to their cognitive styles. Due to the importance of academic achievement in contemporary life and the predicative power of cognitive styles for academic achievement, the researcher decided to take the present topic entitled "A study of academic achievement among secondary school students in relation to their cognitive style."

## OBJECTIVES OF THE STUDY

1. To compare the academic achievement of male and female secondary school students.
2. To compare the cognitive style of male and female secondary school students.
3. To compare the academic achievement of secondary school students with respect to various groups of cognitive style i.e. Integrated Style vs. Intuitive Style, Integrated style vs. Split style, Integrated Style vs. Systematic Style, Integrated Style vs. Undifferentiated Style, Intuitive Style vs. Split Style, Intuitive Style vs. Systematic Style, Intuitive Style vs. Undifferentiated Style, Split Style vs. Systematic Style, Split Style vs. Undifferentiated Style and Systematic Style vs. Undifferentiated Style.

## HYPOTHESES OF THE STUDY

1. There is no significant difference in the academic achievement of male and female secondary school students.
2. There is no significant difference in cognitive style of male and female secondary school students.
3. There is no significant difference in the academic achievement of secondary school students with respect to various groups of cognitive styles i.e. Integrated Style vs. Intuitive Style, Integrated style vs. Split style, Integrated Style vs. Systematic Style, Integrated Style vs. Undifferentiated Style, Intuitive Style vs. Split Style, Intuitive Style vs. Systematic Style, Intuitive Style vs. Undifferentiated Style, Split Style vs. Systematic Style, Split Style vs. Undifferentiated Style and Systematic Style vs. Undifferentiated Style.

## METHOD

In the present study, descriptive survey method was employed.

## VARIABLES USED

**Independent Variable:** Cognitive Style

**Dependent Variable:** Academic Achievement

## SAMPLE

A sample of 250 secondary school students affiliated to C.B.S.E. selected on the basis of random sampling method.

## TOOLS USED

1. **Academic achievement:** In the present study, academic achievement of the students was determined on the basis of their previous examination marks. For the purpose of the study, the investigator obtained 8<sup>th</sup> class examination total marks of the students from their school records.
2. **Cognitive Style:** Cognitive Style Inventory (CSI) by Jha (2011) was used to assess cognitive styles among students.

## STATISTICAL TECHNIQUES

Mean, Standard deviation and 't' test were used to analyse the data.

## DATA ANALYSIS AND INTERPRETATION

The collected data was analyzed both quantitatively as well as qualitatively. In order to verify the objectives and to test the null hypotheses, the present study has been analyzed as given below:

**Objective 1: To compare the academic achievement of male and female secondary school students.**

For the purpose of studying the difference in academic achievement of male and female secondary school students, the following null hypothesis was formulated.

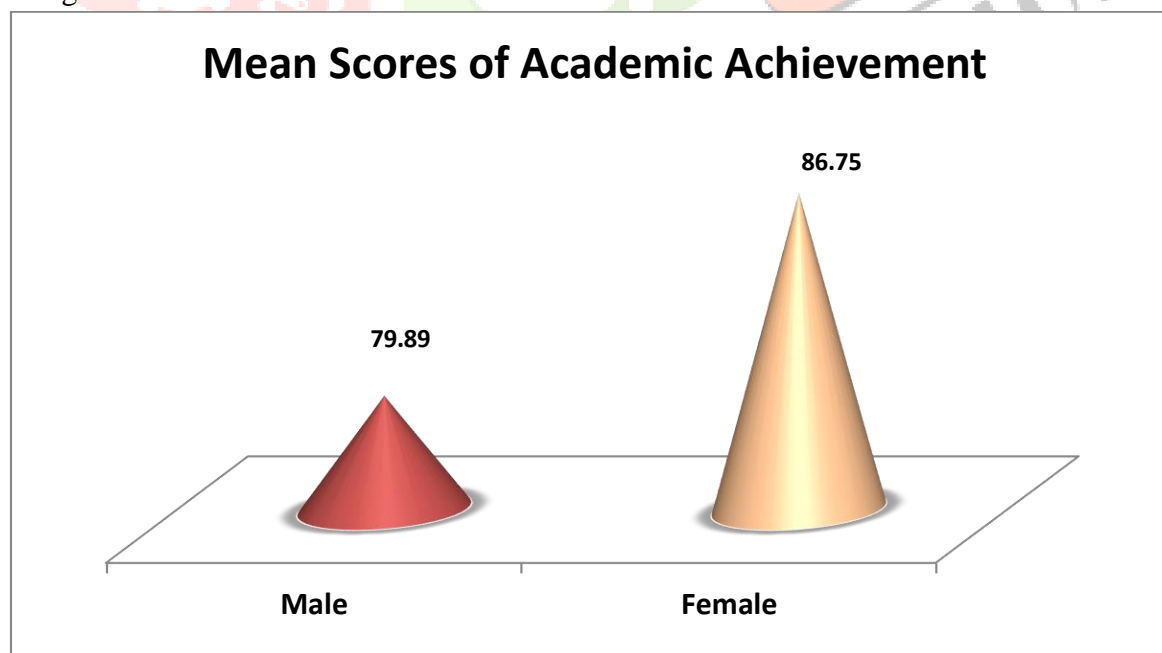
**H<sub>01</sub>** There is no significant difference in the academic achievement of male and female secondary school students.

To test the hypothesis, Mean, Standard Deviation, Standard Error of Mean, t-value and level of significance of the scores obtained from academic achievement was calculated with respect to gender. The results are presented in Table-1.

**Table-1**  
Descriptive statistics related to Academic Achievement of Male and Female Secondary School Students

Dependent Variable	Groups	N	Mean	SD	't'
Academic Achievement	Male	130	79.89	11.99	4.83**
	Female	120	86.75	10.56	

\*\* Significant at .01 level



**Fig. 1** Mean Academic Achievement scores of Male and Female Secondary School Students

It is palpable from Table-1 and Fig.1 that the t-value of 4.83 was found significant at 0.01 level, which indicates that academic achievement of male and female secondary school students differ significantly. So, the null hypothesis “There is no significant difference in the academic achievement of male and female secondary school students” is rejected. Thus, we can say that academic achievement is affected by gender. In terms of mean scores, it was found that male secondary school students (79.89) have less academic achievement as compare to female secondary school students (86.75).

**Objective 2: To compare the cognitive style of male and female secondary school students.**

For the purpose of studying the difference in cognitive style of male and female secondary school students, the following null hypothesis was formulated.

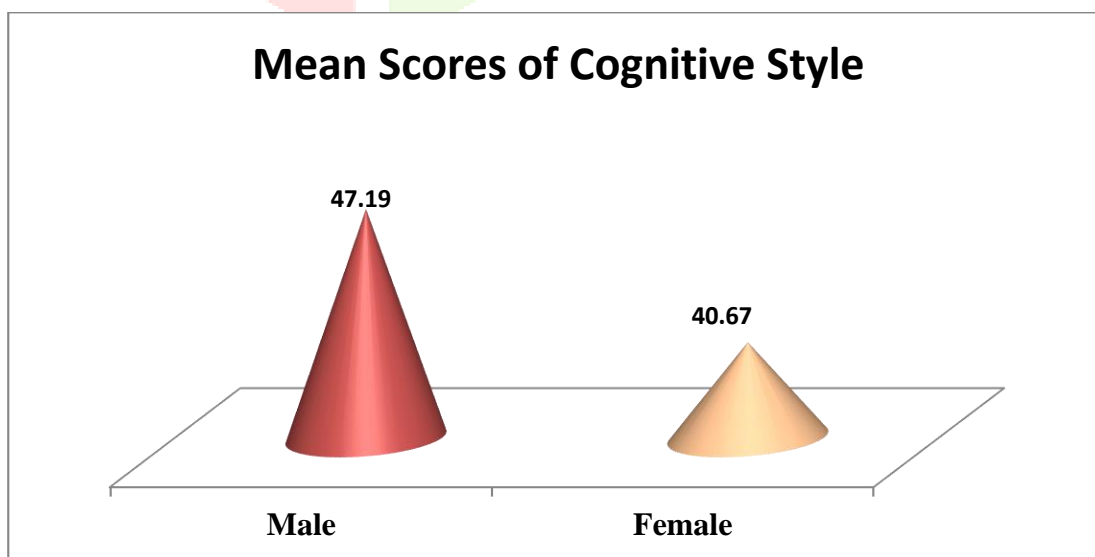
**H<sub>02</sub>** There is no significant difference in the cognitive style of male and female secondary school students.

To test the hypothesis, Mean, Standard Deviation, Standard Error of Mean, t-value, and level of significance of the scores obtained from cognitive style scale was calculated with respect to gender. The results are presented in Table-2.

**Table-2**  
**Descriptive statistics related to the Cognitive Style of Male and Female Secondary School Students**

Dependent Variable	Groups	N	Mean	SD	't' value
Cognitive Style	Male	129	47.19	12.09	4.37**
	Female	121	40.67	11.60	

\*\* Significant at .01 level



**Fig. 2: Mean Cognitive Style scores of Male and Female Secondary School Students**

From Table-2 and Fig.2, it was observed that the t-value of 4.37 was found significant at 0.01 level, which indicates that cognitive styles of male and female secondary school students differ significantly. So, the null hypothesis “There is no significant difference in the cognitive style of male and female secondary school students” is rejected. Thus, we can say that cognitive styles are affected by gender. In terms of mean scores, it was found that male students (47.19) have better cognitive style as compare to female students (40.67).

**Objective 3: To compare the academic achievement of secondary school students with respect to various groups of cognitive style i.e. Integrated Style vs. Intuitive Style, Integrated style vs. Split style, Integrated Style vs. Systematic Style, Integrated Style vs. Undifferentiated Style, Intuitive Style vs. Split Style, Intuitive Style vs. Systematic Style, Intuitive Style vs. Undifferentiated Style, Split Style vs. Systematic Style, Split Style vs. Undifferentiated Style and Systematic Style vs. Undifferentiated Style.**

For the purpose of studying the difference in academic achievement of secondary school students with respect to various groups of cognitive style, the following null hypothesis was formulated.

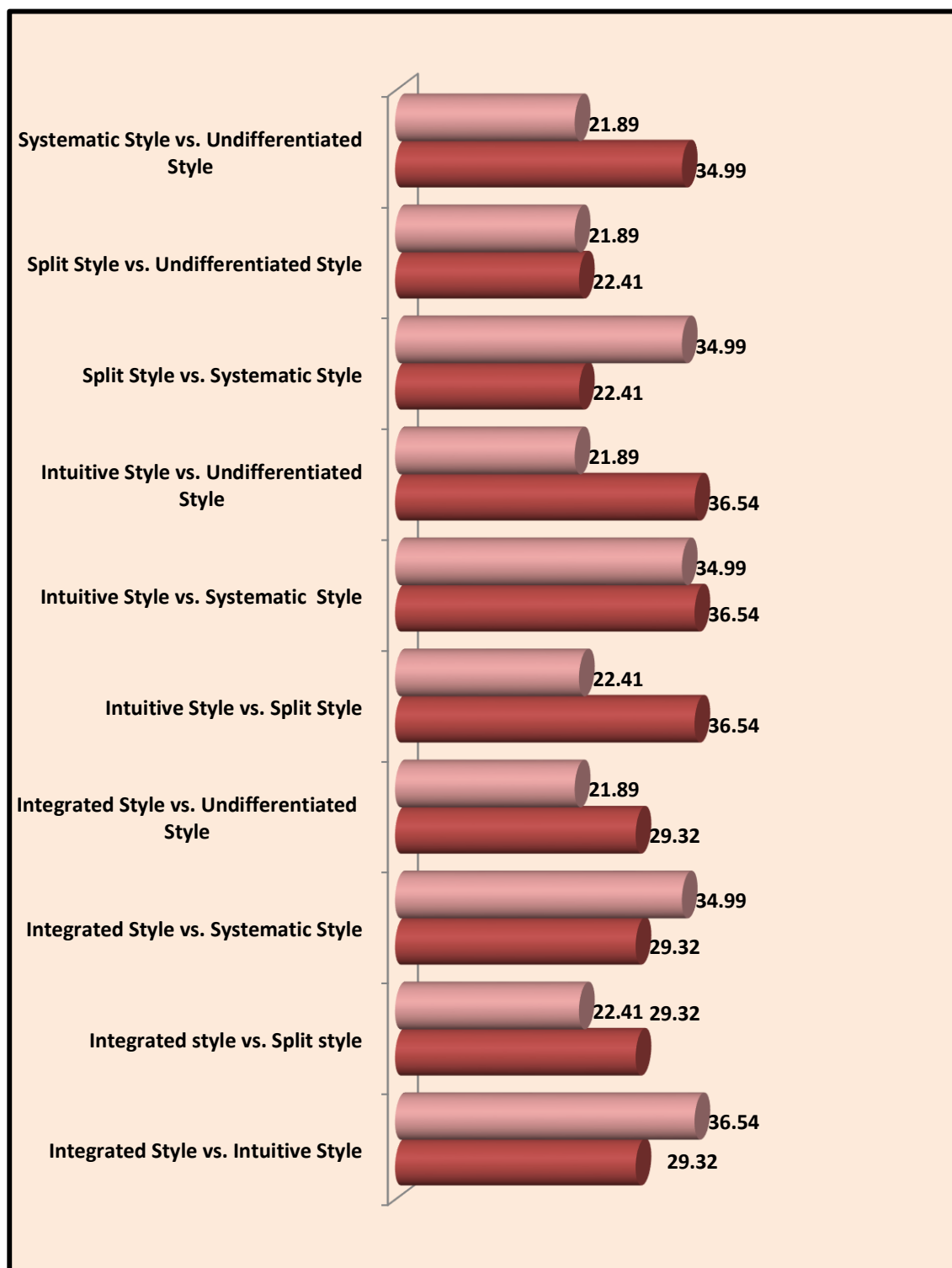
**H<sub>03</sub>** There is no significant difference in academic achievement of secondary school students with respect to various groups of cognitive style i.e. Integrated Style vs. Intuitive Style, Integrated style vs. Split style, Integrated Style vs. Systematic Style, Integrated Style vs. Undifferentiated Style, Intuitive Style vs. Split Style, Intuitive Style vs. Systematic Style, Intuitive Style vs. Undifferentiated Style, Split Style vs. Systematic Style, Split Style vs. Undifferentiated Style and Systematic Style vs. Undifferentiated Style.

To test the null hypothesis, Mean, Standard Deviation, t-value, and level of significance of the scores obtained from academic achievement was calculated with respect to various groups of cognitive style. The results are presented in Table-3.

**Table-3**  
**Descriptive statistics related to the Academic Achievement of Secondary School Students with respect to various groups of Cognitive Style**

Sr. No.	Groups of Cognitive Style	N		Mean		S.D.		t-values
1	<b>Integrated Style vs. Intuitive Style</b>	50	60	29.32	36.54	10.14	11.01	3.59**
2	<b>Integrated style vs. Split style</b>	50	45	29.32	22.41	10.14	9.67	3.42**
3	<b>Integrated Style vs. Systematic Style</b>	50	55	29.32	34.99	10.14	10.89	2.77**
4	<b>Integrated Style vs. Undifferentiated Style</b>	50	40	29.32	21.89	10.14	9.11	3.67**
5	<b>Intuitive Style vs. Split Style</b>	60	45	36.54	22.41	11.01	9.67	6.99**
6	<b>Intuitive Style vs. Systematic Style</b>	60	55	36.54	34.99	11.01	10.89	0.75(NS)
7	<b>Intuitive Style vs. Undifferentiated Style</b>	60	40	36.54	21.89	11.01	9.11	7.25**
8	<b>Split Style vs. Systematic Style</b>	45	55	22.41	34.99	9.67	10.89	6.13**
9	<b>Split Style vs. Undifferentiated Style</b>	45	40	22.41	21.89	9.67	9.11	0.25(NS)
10	<b>Systematic Style vs. Undifferentiated Style</b>	55	40	34.99	21.89	10.89	9.11	6.39**

\*\* Significant at 0.01 level; NS - Not significant



**Fig. 3: Cognitive Style wise Mean Academic Achievement scores of Secondary School Students**

A close perusal of Table-3 revealed that t-value of 3.59 was found significant at 0.01 level, which indicates that the students belonging to integrated style vs. intuitive style differ significantly. From the comparison of mean scores it was concluded that students belonging to intuitive style (36.54) have significantly higher academic achievement than the students belonging integrated style (29.32). Likewise, the 't'-value 3.42 for the students having integrated style and for students belonging split style was found significant at 0.01



level, which indicates that the students of these groups differ significantly. In terms of mean scores it was found that students belonging to integrated style (29.32) have significantly higher academic achievement than the students belonging split style (22.41). The 't' value 2.77 vide Table-3 was found significant at 0.01 level, which revealed that students belonging to integrated style vs. systematic style differ significantly. In terms of mean scores it was concluded that students belonging to systematic style (34.99) have higher academic achievement as compared to students having integrated style (29.32).

Similarly, the t-value 3.67 was also found significant at 0.01 level, which indicates that the students belonging to integrated style vs. undifferentiated style differ significantly. From the comparison of mean scores it was concluded that students belonging to integrated style (29.32) have significantly higher academic achievement than the students belonging undifferentiated style (21.89). The 't' value 6.99 vide Table-3 was found significant at 0.01 level, which revealed that students belonging to intuitive style vs. split style differ significantly. In terms of mean scores, it was concluded that students belonging to intuitive style (36.54) have higher academic achievement as compared to students having split style (22.41).

However, 't'-values (0.75 and 0.25) vide Table-3 for students belonging to intuitive style vs. systematic style and students belonging to split style vs. undifferentiated style were not found significant at 0.05 level, which indicates that students of these groups did not differ significantly. It can be interpreted from the Table-3 that 't'-value (7.25) for students belonging to intuitive style vs. undifferentiated style was found significant at 0.01 level, which inferences that students of these groups differ significantly. From the comparison of mean scores, it can be concluded that students belonging to intuitive style (36.54) have significantly higher academic achievement than the students having undifferentiated style (21.89). From table-3, it can be easily observed that the 't' value (6.13) for students belonging to intuitive style vs. systematic style was found significant at 0.01 level, which inferences that students of these groups differ significantly. From the comparison of mean scores, it can be concluded that students belonging to systematic style (34.99) have significantly higher academic achievement as compared to the students belonging to split style (22.41). Lastly, an examination of the 't'-value (6.39) vide table-3 showed that students belonging to systematic style vs. undifferentiated style was found significant at 0.01 level, which indicates that students of these groups differ significantly. From the comparison of mean scores, it can be concluded that students belonging to systematic style (34.99) have significantly higher academic achievement as compared to the students belonging to undifferentiated style (22.41).

## CONCLUSION

The progress of the nation depends upon the intellectual capacity of its citizens. Therefore, it is necessary to identify the talents in our children and to provide them suitable opportunities, which will enable them to develop their potentialities in the direction of higher achievement. The important fact is that students whose cognitive style does not match the methods of instructional materials are penalized, negatively affecting their academic achievement. Therefore, school authorities should pay attention to increase these abilities as these abilities are at root level in this stage. Increase the autonomy of students in terms of curriculum and disciplinary matters may greatly enhance their cognitive style. Knowledge and awareness of cognitive style may be useful to individuals for purposes of self management. By knowing one's own style, one can expand on its strengths and learn techniques for mitigating the negative aspects or weaknesses. Thus, it can be inferred that students' success or failure are connected with cognitive style.

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