

## **The correlates of cognitive skills among high school children**

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### **ABSTRACT**

The study was conducted to explore the cognitive skills of high school children. The random sample consisted of 240 high school children (120 boys and 120 girls) studying in class 8, 9 and 10, age range of 13 to 15 years drawn from four English medium schools of urban areas in Dharwad city during 2013-2014. Cognitive skills were assessed by using Standard Raven Progressive Matrices by Raven (1936) and socio-economic status was measured by using socio-economic scale by Aggarwal *et al.* (2005). Results revealed no significant association between cognitive skills and age, gender and socio-economic status of high school children.

**Key Words :** Cognitive skills, Socio-economic status, Reasoning and apprehension, Correlates

### **INTRODUCTION**

Skills are the learned abilities to carry out tasks with pre-determined results often within a given amount of time, energy, or both. In other words the abilities that one possesses. Skills can often be divided into domain- general and domain-specific skills. For example, in the domain of work, some general skills would include time management, teamwork and leadership, self motivation and others, whereas domain-specific skills would be useful only for a certain job. Skills usually require certain environmental stimuli and situations to assess the level of skill being shown and used.

Cognition is the study of the thought processes or mental activity by which we acquire and deal with knowledge. The study of human cognition is a vast field, encompassing an extremely wide variety of topics. It refers to the interpretation of sensory events, their registration and efficient recovery from memory, the ability to manipulate solving. Thus, cognitive activity consists of active processes in perception, memory, ideation, reasoning and evaluation.

The cognitive developmental perspective focuses on how children construct knowledge and how their constructions change overtime. Piaget (1958) believed that children naturally try to make sense of their world. Throughout infancy, childhood, and adolescence, youngsters want to understand the workings of both the physical and the social world. In Piaget's view, around 11 years of age, children will reach the formal operational stage which was the endpoint of cognitive development. By

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the formal operational stage, children become capable of reasoning in propositional, abstract, and hypothetical ways (Inhelder and Piaget, 1958). Vygotsky (1978), believed that the child's social environment was an active force in their development, working to mould children's growing knowledge in ways that were adaptive to the wider culture in which they grow up. Robbie Case (1985), believes that shifts in cognitive development result from increases in the child's information-processing capacity (namely, their working memory). The processing speed, voluntary response suppression, and working memory mature through late childhood and into adolescence (Luna *et al.*, 2005). Asthana (2011), found that there male and female differ significantly in their scholastic achievement and female students were better off than their male counterpart. Rana and Kaur (2003), revealed that nature and nurture is responsible for the IQ of an individual. To get a better understanding of cognitive skills development of the high school children the following objectives was undertaken for the study-

1. To know the influence of age on cognitive skills of high school children.
2. To know the influence of gender on cognitive skills of high school children.
3. To know the influence of socio-economic status on cognitive skills of high school children.

## METHODOLOGY

### Sample :

The sample of the study constituted 240 children from four high schools residing in urban areas and from each school a minimum of 60 students *i.e.* 20 (10 boys and 10 girls) of age 13 to 15 years studying in class 8, 9 and 10 were selected for the study. The samples were randomly drawn from each class.

### Tools :

#### ***Self-structured questionnaire:***

The self structured questionnaire was used to elicit general information of the samples. The questionnaire consisted of 23 items to collect information about the subject and family.

#### ***General ability test :***

Raven's Standard Progressive Matrices (SPM) developed by Raven (1998), is a test of a person's reasoning capacity at the time of the test to apprehend meaningless figure presented for observation, see the relations between them, conceive the nature of the figure completing each system of relations presented, and, develop a systematic method of reasoning. The scale consists of 60 problems divided into five sets A, B, C, D, E with 12 problems in each set and each set begins with simple problems and end with complex ones.

#### ***Socio economic scale:***

The Socio-economic status was ascertained by using Socio-economic status scale by Aggarwal *et al.* (2005). The scale consists of 22 statements which assess education, occupation, monthly per capita income from all sources, family possessions, Number of children, Number of earning members in family, education of children, domestic servants in home, possession of agricultural land and non-agricultural land along with animals and social status of the family.

## RESULTS AND DISCUSSION

A close view on the Table 1 shows the cognitive skills of 13, 14 and 15 years children. From the table it can be seen that about 15.9 per cent of 15 years children, 9.5 per cent of 14 years children and 8.1 per cent of 13 years children had superior cognitive skill. It is also observed that 54 per cent of 13

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years children, 41.7 per cent of 14 years children and 30.2 per cent of 15 years children had above average cognitive skills. Whereas, 48.7 per cent of 15 years children, 44 per cent of 14 years children and 27 per cent of 13 years children had average cognitive skills. About 10.8 per cent of 13 years children were below average followed by 5 per cent of 15 years children and 4.7 per cent of 14 years children. No significant association was found between cognitive skills and age of high school children ( $\chi^2=11.91$ ). The comparison of mean scores showed that 13 years children (48.08) had better cognitive skills followed by 15 years children (48.00) and 14 years children (47.54). The F-value of 0.21 was not significant. No significant relation was observed ( $r=0.01$ ).

An examination of Table 2 depicts that, 48.3 percent of boys had average social skills, 33.3 per cent of boys had above average, while 12.5 per cent of boys had superior cognitive skills and 5.8 per cent were below average in cognitive skills. Among girls 42.5 percent had above average cognitive skills, followed by 39.2 per cent of girls had average social skills, while 12.5 per cent of girls had superior cognitive skills and 5.8 per cent were below average in cognitive skills. However, Chi-square analysis shows no significant association between boys and girls in cognitive skills ( $\chi^2=3.46$ ). Comparison of mean scores revealed no significant differences between boys and girls on cognitive skills (47.50 and 48.20, respectively). The t-value of 0.98 was not significant.

An appraisal of Table 3 shows the association between socio-economic status and cognitive skills of high school children. A glance in the table showed that among the children from high socio-economic status, 39.2 per cent of children were above average in cognitive skills, 38.1 per cent of children were average, 17.5 per cent were superior in cognitive skills and 5.15 per cent of children were below average. Children from middle socio-economic status, 47 per cent had average cognitive skills,

**Table 1 : Association between age and cognitive skills of high school children (N=240)**

Age	Cognitive skills				Total	Modified $\chi^2$	Mean (SD)	F-value	r
	Intellectually superior	Above average	Average	Below average					
13 years	3 (8.1)	20 (54.0)	10 (27.0)	4 (10.8)	37 (100)	11.91	48.08 (6.27)	0.21 NS	0.01
14 years	8 (9.5)	35 (41.7)	37 (44.0)	4 (4.7)	84 (100)		47.54 (5.25)		
15 years	19 (15.9)	36 (30.2)	58 (48.7)	6 (5.0)	119 (100)		48.00 (5.51)		
Total	30 (12.5)	91 (38.0)	105 (43.7)	14 (5.8)	240 (100)		47.85 (5.52)		

Note: Figure in the parentheses indicates percentage, NS-Non Significant

**Table 2 : Association between cognitive skills and gender of high school children (N=240)**

Gender	Cognitive skills				Total	Modified $\chi^2$	Mean (SD)	t-value
	Intellectually superior	Above average	Average	Below average				
Male	15 (12.5)	40 (33.3)	58 (48.3)	7 (5.8)	120 (100.0)	3.46	47.50 (5.83)	0.98
Female	15 (12.5)	51 (42.5)	47 (39.2)	7 (5.8)	120 (100.0)		48.20 (5.21)	
Total	30 (12.5)	91 (37.9)	105 (43.8)	14 (5.8)	240 (100.0)			

Note: Figure in the parentheses indicates percentage

37.3 were above average, 9.70 per cent were superior and 5.97 per cent were below average. For children from poor socio-economic status, 55.5 per cent of children were in average and 33.3 were above average in cognitive skills, 11.1 per cent were below average and no children were superior. The Chi-square analysis did not show any significant association between socio-economic status on cognitive skills of high school children ( $\chi^2=5.84$ ). Comparison of mean scores reveals that children from high socio-economic status had better cognitive skills compared to other groups (48.72, 47.28 and 47, respectively). The F-value of 2.05 was not significant. It means there was no significant relation was observed between socio-economic status and cognitive skills ( $r=0.12$ ).

The cognitive developmental perspective focuses on how children construct knowledge and how their constructions change overtime. Jean Piaget (1896-1980), who was the most influential developmental psychologist of the 20<sup>th</sup> century, proposed the best-known of these theories. Piaget believed that children naturally try to make sense of their world. Throughout infancy, childhood, and adolescence, youngsters want to understand the workings of both the physical and the social world. In Piaget's view, around 11 years of age, children will reach the formal operational stage which was the endpoint of cognitive development. By the formal operational stage, children become capable of reasoning in propositional, abstract, and hypothetical ways (Inhelder and Piaget, 1958). The present

SES	Cognitive skills				Total	Modified $\chi^2$	Mean (SD)	F value	r
	Intellectually superior	Above average	Average	Below average					
High	17 (17.5)	38 (39.2)	37 (38.1)	5 (5.15)	97 (100)	5.84	48.72 (5.62)	2.05 NS	0.12
Medium	13 (9.70)	50 (37.3)	63 (47.0)	8 (5.97)	134 (100)		47.28 (5.35)		
Poor	0 (0)	3 (33.3)	5 (55.5)	1 (11.1)	9 (100)		47.00 (6.38)		
Total	30 (12.5)	91 (38)	105 (43.7)	14 (5.8)	240 100.0		S.Em= 0.5		

Note: Figure in the parentheses indicates percentage, NS- Non Significant

SES	Cognitive skills				Total	r
	Intellectually superior	Above average	Average	Below average		
High	17 (17.5)	38 (39.2)	37 (38.1)	5 (5.15)	97 (100)	0.12
Medium	13 (9.70)	50 (37.3)	63 (47.0)	8 (5.97)	134 (100)	
Poor	0 (0)	3 (33.3)	5 (55.5)	1 (11.1)	9 (100)	
Total	30 (12.5)	91 (38)	105 (43.7)	14 (5.8)	240 100.0	

Note: Figure in the parentheses indicates percentage

study examines the cognitive skills of high school children. However, 13 years children had better cognitive skills than other group. The reason may be that with increase in class children's attention are more towards academic attainment. Devi *et al.* (1996) and Suneetha and Mayuri (2001) found early and late adolescent respondents significantly different on cognitive skills. No significant difference was found between boys and girls in cognitive skills. Pandey and Ahmed (2008) provide evidence that there is no gender difference in cognitive skills of the adolescents. This may be because in the present day situation parents, society and schools are giving equal importance and opportunity to both boys and girls.

Cognitive skills did not show any significant association with socio-economic status and also no significant correlation was observed. It would mean that regardless of socio-economic status students may have high or low cognitive skills. The probable reason may be parents' whether from high or low socio-economic status are aware of the importance of stimulating environment which has bearing on children's cognitive skills. Family Socio-economic status is the largest predictor of children's status at school entry; Socio-economic status predicts children's cognitive status at school entry more than race and ethnicity (Lee and Buckram, 2002).

#### **Conclusion:**

The result in the study showed that children of 13 years had better cognitive skills compared to children of 14 years and 15 years. As, age increase's, the child becomes more determined and focussed towards academic achievement. Gender roles are shared expectations of men's and women's attributes and behaviour, and are internalized early in development. The study showed no significant difference between boys and girls in cognitive skills. Socio-economic status also showed no significant association with cognitive skills of high school children. On the basis of the result, we can say socio-economic status does not have any impact on the development of cognitive skills of high school children.

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