

## Mental Ability of School Going Girls (7-11 years) of Bikaner City (2014-15)

Bhavana Panwar

Guest Faculty in Vidhya Sambal Yojna, Government Girls College, Didwana, Rajasthan, India

### ABSTRACT

The present study was undertaken to assess and compare Mental Ability of school going girls (07-11years) studying in Upper Primary Co- educational Government Schools of Bikaner city. The total sample for the present study consisted of 60 randomly selected (lottery) girls from three randomly selected Upper Primary Co-educational Government Schools. Twenty girls i.e. (10 girls of age 7-9 years and 10 girls of age 9-11 years) were selected from each of three schools. The Data were collected through standardized tool i.e. General Mental Ability Test for Children developed by Srivastva and Saksena (2003). Frequency, percentage were computed to assess the aspects of the mental ability (analogy, classification, number series, reasoning problems, absurdities and overall mental ability). The assessment of school going girls revealed that mental ability aspects i.e. classification, number series, reasoning problems and absurdities (means not so much absurd) were of high average level. The three subtest of mental ability i.e. analogy, classification and overall mental ability were found to be significant. The number series and absurdities were significant at 5 per cent level of significance whereas, reasoning problems were not found significant in girls. The study will be helpful for enhancing the mental ability of school going girls as well as timely guidance can be rendered by parents and teachers. It will also be helpful to identify problem areas of mental ability in school going girls. In this competitive age, children are facing tough competitions in social and educational sectors which require parents as well teachers to help them for coping with life in a satisfactory manner.

### INTRODUCTION

Education is universally recognized as a major component of human development. Education itself begins with the birth of an individual in the family. One of the most important roles of education is to stimulate the mental growth of children, in order for them to make sense of the world around them. Problem solving, logical reasoning and creative thinking are all fundamental skills required for life. These thinking skills should be developed during the primary and secondary school years, the most pertinent years of a person's cognitive development.

The development of the children is a true indicator of our progress. Young children are now recognized as the first call on the agenda of development, not only because this is a desirable societal investment in the nation's future human resource development, but also because early childhood is both the most vulnerable

and the most crucial period when the foundations are laid for cumulative life-long learning and human development (Sangwan *et al.*, 2013).

The first five years of life are crucial for physical, social, emotional, cognitive and language development of the child because during this period the foundation for all later development is laid. The child is highly receptive to the environment and learning potentials are at its peak. In relation to the general level intelligence reached at the age of 21, about 50 per cent of aptitudes are already fixed at the age of 4, the following 30 per cent are achieved between 4 and 8 years and the remaining 20 per cent between 8-21 years. Piaget believe that cognitive process develop in an orderly sequence and depends on maturation of brain and interactions with their environment. Further, its outcome depends on the

**How to cite this paper:** Bhavana Panwar "Mental Ability of School Going Girls (7-11 years) of Bikaner City (2014-15)" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-8 | Issue-2, April 2024, pp.602-608, URL: [www.ijtsrd.com/papers/ijtsrd64718.pdf](http://www.ijtsrd.com/papers/ijtsrd64718.pdf)



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**KEYWORDS:** *Mental ability, School age children, Analogy, Classification, Number series, Reasoning problems, Absurdities, Intelligence Quotient*

quality of children’s experiences both inside and outside of the formal classroom because young children go through a series of psychosocial and neurobiological changes. Children’s ability to acquire knowledge and then use it effectively to plan, monitor and evaluate their own capabilities is better ensured during early years of life (Asthana, 1991).

Piaget (2001) referred to the cognitive development occurring between ages 7 and 11 years as the concrete operational stage. While in concrete operations, children cannot think logically and abstractly. They are limited to thinking “concretely,” or in tangible, definite, exact, and uni-directional terms based on real and concrete experiences rather than on logical abstractions. These children do not use “magical thinking,” so they are not as easily misled as younger children.

Piaget noted that children's thinking changes significantly during the concrete operational stage. They can engage in *classification*, which is the ability to group according to features, and serial ordering, which is the ability to group according to logical progression. Older children come to understand cause-and-effect relationships, so they become adept at mathematics and science. They also comprehend the concept of stable identity—that “self” remains constant even when circumstances change. For example, older children know that their father maintains a male identity regardless of what he wears or how old he becomes.

In Piaget's view, children at the beginning of concrete operational stage do demonstrate conservation. Unlike preschoolers, school-age children understand that the same amount of clay moulded into different shapes remains the same. Children in concrete operational period have also advanced beyond the egocentrism of preschoolers. By the school years, children have usually learned that other people have their own views, feelings, and desires.

Around age 6, children begin to change the way they think about the world. They leave behind the preschooler's egocentric thinking and begin developing more mature ways of understanding. A typical first-grader is able to perform simple addition and subtraction, and he or she usually begins to read and write sentences. These tasks require that the child consider information from several sources, evaluate it, and come up with an interpretation. Child develops conservation skills (first mass and then volume).

- Child begins to apply mental operations to real, concrete problems, objects, or events.
- Child now has the ability to decentrate; he can now take other people’s point of view.

- Subjective morality - There is now a consideration of the intent behind an action. There is an almost "black-and-white" sense of right and wrong.

Early experiences of interaction with insensitive material predicted the persistence of poorer cognitive functioning (Lynne *et al.*, 2006). Allowing school aged children to discover and explore freely is the foundation for developmental learning and there is an ample amount of evidence of positive impact which school has in the development of cognition.

Swamy *et al.* (2013) revealed that Intelligence quotient (IQ) is widely used to assess different aspects of *mental ability*. Development in *mental ability* initiates from conception and continues through adulthood. Various environmental factors affect IQ. Different patterns of brain growth, function and IQ amongst male and female subjects as well as defining the environmental factors that can affect cranial capacity and that the IQ and cranial capacity may be improved by tuning up the lifestyles and economic conditions of the families in developing countries.

*Mental Ability* is the power to learn or retain knowledge; the ability to understand the facts and significance of the behavior. Human *mental ability* has both general and specific components; the general component is the larger source of individual differences; it is predominantly a product of biological evolution, and is more strongly hereditary than are specific abilities, or special talents. *Mental ability*, which ranges widely in every large population, is normally distributed, and various human races differ, on average, in *mental ability*. General ability is best measured by a variety of fairly simple tests of sensory discrimination and reaction time (Jensen, 1998).

The *general mental ability* of a person depends on the quality of training that one receives in childhood. During childhood children have huge potential to develop their *mental ability* as they can rapidly grasp and learn things.

Tomonori *et al.* (2003) mention that the time from 0-8 years is the critical period in the development of many foundational skills in all areas of development. Therefore, it is significant that children receive good education during this period so as to develop their good *mental ability*.

*General Mental Ability* in the present study refers to five mental abilities—*analogy, classification, number series, reasoning problems, and absurdities.*

In the school period mental development is characterized by the rapid expansion of cognitive

abilities. A number of cognitive capacities critical to child's overall intelligence begin to develop during this period. This includes early development of concepts, attention, relation abilities and perceptual maturation. The concepts that a child develops are many basic concepts in children's cognitive development includes those rational concepts that children use to describe what they see, hear, and feel. A child's ability to understand and use these concepts is considered essential not only to school learning but also to follow verbal instructions.

Modern age is called as the age of science and technology. It is also known as age of competition. In this competitive age, children are facing tough competitions in social and educational sectors which require parents as well teachers to help them for coping with life in a satisfactory manner. For this, parents should create an atmosphere which may be accepting and warm or may be critical, dominating, and neglectful or caring, which affects the behavior of their child. It is generally, believed that parental care, concern, guidance and influence of 'parental encouragement' have an effect on the educational development of the child. Further, to promote in the children more better quality of cognitive skills/mental abilities such as clarification of number concepts, categorization etc., appropriate and timely identification and assessment of such abilities by parents and teachers are require for the development of children's personality.

Hence, the investigator intended to undertake the present study to assess the mental ability of the school going girls with the following objectives:

### Objectives

1. To assess the *mental ability* of selected school going girls (7-11 years)

### Delimitation of the study

1. The present study was delimited to girls of age group of 7-11 years studying in co-educational upper primary (Government) schools of Bikaner city within municipal units.

### Operational Definitions

#### 1. Mental ability

In the present study *mental ability* is being operationalized as the capacity to perform the higher mental process such as reasoning, remembering, understanding, *classification*, problem solving etc.

#### 2. School age children

The term in the present study means 07 – 11 years of children who are studying in schools. During this stage, children develop socially and mentally. They make new friends and gain skills, which were enable them to become more independent and enhance their individuality.

### 3. Analogy

The term *Analogy* was operationalized in the present study as a comparison between one thing and another, typically for the purpose of explanation or clarification. For example – Ball: Playing. Book: ? (1. School, 2. Reading, 3. Student, 4. Children)

### 4. Classification

It means the action or process of classifying objects. For example – 1. Monday, 2. Tuesday, 3. June, 4. Friday, 5. Saturday

### 5. Number series

It means the ability to arrange number along a quantitative dimension in series/ sequences etc. For example – 3, 6, 9, 12 .....?

### 6. Reasoning problems

It refers to the process of forming conclusions, judgments and interferences from facts or premises. For example – Ramesh and Suresh have equal coin, both gave their one coin to the begger, now who have more coins?

- A. Ramesh, B. Suresh, C. Both have equal coins, D. Can't say

### 7. Absurdities

The term is present study means the state of being unreasonable. The condition in which a statement and picture have no purpose or meaning. For example – Mother asked her child that "What was the time? The son answered "I will tell you after checking the calendar. The statement was wrong. Why?

- A. Mother should not ask such question to her son  
B. Time is not shown on calendar  
C. Calendar should not be placed on well.

### 8. Intelligence Quotient ( I.Q.)

Intelligence Quotient is being calculated by dividing the test takers' Mental Age (MA) by their Chronological Age (CA) then, multiplying this number by 100 ( $IQ = MA/CA \times 100$ ).

### Review of Literature

A literature review is an evaluative report of studies found in the literature related to the selected area. The review should describe, summarize, evaluate and clarify this literature. It should give a theoretical basis for the research and help to determine the nature of our own research. Select a limited number of works that are central to our area rather than trying to collect a large number of works that are not as closely connected to our topic area. This chapter attempts to give an overview of the literature reviewed by the investigator to the theoretical and empirical aspects of the study more securely with the help of the related literature. The researcher is able to interpret the significance of the results.

Spearman (1927), concluded that intelligence comprises of “g” or general factor and a number of “s” or specific factors. He regarded ‘g’ as general mental energy or ability which would be improved in all cognitive tasks, and “s” factors as factors unique to a particular task.

Intelligence is innate, general cognitive ability (Burt, 1955). Intelligence is “the aggregate or global capacity of the individual to act purposively, to think rationally and to deal effectively with environment (Wechsler, 1958).

Intelligence ranged from the ability to carry on abstract thinking “through an acquiring capacity”, “a group of complex mental process”, the power of good responses from the point of view off truth or fact,” and the ability to learn to adjust oneself to the environment” to a general modifiability of nervous system (Resnick, 1976).

Establishing a definition of intelligence that satisfies everyone has been extremely difficult (Sternberg and Powell, 1983).

The term intelligence refers to individuals’ abilities to understand complex ideas, to adopt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by careful thought (Neisser *et al.*, 1996).

Intelligence is related to many important outcomes, how quickly individuals can master in new tasks and adapt to new situations, how successful they will be in school and in various kinds of job, and even how well they can get along with others (Goleman, 1998).

In, Whalley *et al.* (2000) published a paper in the journal *Neurology*, which examined links between childhood mental ability and late-onset dementia. The study showed that mental ability scores were significantly lower in children who eventually developed late-onset dementia when compared with other children tested .

The **g factor** (short for "general factor") is a construct developed in psychometric investigations of cognitive abilities. It is a variable that summarizes positive correlations among different cognitive tasks, reflecting the fact that an individual's performance at one type of cognitive task tends to be comparable to his or her performance at other kinds of cognitive tasks. The *g* factor typically accounts for 40 to 50 percent between-individual variance in IQ test performance, and IQ scores are frequently regarded as estimates of individuals' standing on the *g* factor (Kamphaus *et al.*, 2005).

Michell (2009), reported that school going children learn to mentally combine, separate, order and

transform objects and actions. They learn to conserve mass and area, with many, also learn to conserve volume. Their ability to apply logic and vision increase as does their ability to focus attention.

The terms IQ, general intelligence, general cognitive ability, general mental ability, or simply intelligence are often used interchangeably to refer to the common core shared by cognitive tests (Deary *et al.*, 2010).

Swamy *et al.* (2013) revealed that Intelligence quotient (IQ) is widely used to assess different aspects of *mental ability*. Development in *mental ability* initiates from conception and continues through adulthood. Various environmental factors affect IQ. Different patterns of brain growth, function and IQ amongst male and female subjects

### Materials and Methods

The present chapter is devoted to methods and procedures used in the execution of the present study. The methodological details are organized under the following five major sections:

- Locale of the study
- Sample and its selection
- Tool and its description
- Procedure for data collection
- Analysis of data

#### ➤ **Locale of the study**

The present study was conducted in the selected Upper Primary Co- educational schools (Government) of Bikaner city (Rajasthan) within its municipal limits to ensure optimum personal individualistic contact with the subjects for the data collection. Analysis and writing work were done at college of Home Science, Swami Keshwanand Rajasthan Agricultural University, Bikaner.

#### ➤ **Sample and its selection**

##### The sample

A random selection method was used for the selection of both schools and children for the present study. A sample of 60 girls of 07-11 years of age studying in selected 3 Upper Primary Co- educational schools (Government) of Bikaner city who fulfilled the criteria fixed were included as a sample for the present study.

##### Procedure for Sample Selection

The total sample for the present study consisted of 60 respondents randomly selected from 3 randomly selected Upper Primary Co- educational schools (Government).

First step was the selection of the schools after obtaining the list of several Upper Primary Co-educational schools (Government), situated within the municipal limits of Bikaner city from the local office

of the “Directorate of Education (DOE)”. (Appendix-I)

Then, out of that list of Upper Primary Co-educational schools (Government), a random selection (lottery system) was adopted to select required three schools. For this, a list of students studying in 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> standards was taken from the principals of the selected schools. Then, 20 girls were selected from each school of age 07-11 years [20 girls (10 of 7-9 years and 10 of 9-11 years x 3 schools)].

So the final sample was consisted of 60 girls.

The preliminary proforma was given to the students in which the necessary information for the selection of the respondents was given. The information sought was regarding the name of the respondents, age, gender, education, caste family income, father’s and mother’s occupation etc.

### ➤ Tool and its description

#### Development and Description of tool

Selection and development of tool to achieve the objectives of research is in an important step in any research. Keeping in mind the purpose of the study, the investigator used one major standardized tool for data collection which was, **General Mental Ability Test for Children (GMATC) developed by the Srivastava and Saksena, (2003)**.

#### Description of tool

A standardized tool developed by Srivastava and Saksena (2003), General Mental Ability Test for Children (GMATC) was used for the present study.

#### General Mental Ability Test for Children (GMATC) (Standardized)

It consisted of two sections: Section A and Section B

##### Section A :

This section was consisted of background information of the respondents such as age, sex, caste, income group, occupation of parents, educational level of parents, family size, ordinal position of index child, mass media exposure etc.

##### Section B:

This section of GMATC was consisted of 50 questions to assess the general mental ability of the children of 7-11 years of age. The verbal form of the test was used for the present study.

Verbal form of the test has five sub-tests i.e. *Analogy, Classification, Number series, Reasoning, Problems and Absurdities*. The five subtests have equal number of items i.e. each sub- test consisted of 10 questions (10 x 5 = 50 Questions). Multiple choice type items are kept in the present objective type intelligence test,

where only one correct answer is possible. The testee has to select the correct one and fill its number.

### Procedure of data collection

The subjects selected for the present study were personally contacted at their schools. The purpose of the study was explained prior to administration of the tool. The tools were distributed to them individually and they were expected to fill up the same as per the instructions given by the investigator and return those back to the investigator without consulting each other. The fixed time limit was 15 minutes for the test to complete.

### ➤ Analysis of data

The ensuing description attempts to highlight the method applied by the investigator for processing and analysis of data. The data collected through tool i.e. *General Mental Ability Test for Children (GMATC)* was coded separately and analyzed in the light of the objectives of the present study.

#### General Mental Ability- Scoring Procedure

One mark was provided for each correct answer. The maximum marks which a respondent can obtain was 50.

#### Statistical Analysis

In the light of the objectives set for the investigation, the data obtained were analyzed in the following manner :-

Various techniques of statistics applied to obtain the results for the present study were;

- Frequency
- Percentage
- Mean

The formulae are as follows:

#### Percentage

It can be computed from the following formula:

$$P = \frac{X}{Y} \times 100$$

Where,

P = Percentage

X = Frequency of the respondents

Y = Total number of respondents

#### Mean score

$$\bar{X} = \frac{\Sigma x}{N}$$

Where,

$\bar{X}$  = Mean score

$\Sigma x$  = Total of scores obtained by respondents

N = Total number of respondents

### Results and Discussion

The chapter deals with result and their description in the contest of the objective set for the present

investigation. The chapter has been divided into the following section :

### **Background information of the girls and boys (07-11 years)**

#### **Assessment of Mental Ability (five sub-tests/aspects) of school going girls** **Assessment of the Mental Ability (Five sub tests/aspects) of school going girls**

The mental ability of 60 girls of 7-11 years were assessed by administering the tool on the sample and its results are presented in this section. The responses of total sample was tabulated. The assessment of mental ability was done under the following categories;

The result of regarding sub-test 1<sup>st</sup> that is *Analogy*, reveals that majority of girls (31.67%) had low average level of *mental ability (analogy)*, followed by 28.33 per cent girls were having high average level of *mental ability*, and 18.33 per cent girls had very dull level of *mental ability*, and only 5.00 per cent girls had bright level of *mental ability (analogy)*. It means majority of girls had average level i.e poor *mental ability* as far as the aspect of *analogy* was concerned. Further, it was also found that most of the girls were not able to do comparison between one thing with another, typically for the purpose of explanation or clarification.

The investigator found that girls have more problems than boys to relate different things hence, they have low average level of *analogy* subtest. It can also be concluded that though analogical ability starts developing in very young stage but even than school going children sometimes face difficulties in completing the congrative tasks.

The overview of the results regarding each sub test of *mental ability* revealed that majority of girls (56.67%) possessed high average level of *mental ability* followed by 28.33 per cent with low average level of *mental ability* whereas, 11.67 per cent girls had bright level of overall *mental ability*. Only 1.67 per cent girls had very dull level and in the same percentage (1.67%) girls had excellent level in overall *mental ability*. It indicates that few girls also were found to be good *mental ability* although they had less mass media exposure and lack of availability of resources as per the Indian Societal values/practices in which girls are given less preferences in all the activities for their better growth and development.

### **Summary and Conclusion**

Education is universally recognized as a major component of human development. One of the most important roles of education is to stimulate the mental

growth of children, in order for them to make sense of the world around them. Problem solving, logical reasoning and creative thinking are all fundamental skills required for life. These thinking skills should be developed during the primary and secondary school years, the most pertinent years of a person's cognitive development.

Piaget (2001) referred to the cognitive development occurring between ages 7 and 11 years as the concrete operational stage. While in concrete operations, children cannot think logically and abstractly. They are limited to thinking "concretely," or in tangible, definite, exact, and uni-directional terms based on real and concrete experiences rather than on logical abstractions. These children do not use "magical thinking," so they are not as easily misled as younger children.

*General Mental Ability* in the present study refers to five mental abilities—*analogy, classification, number series, reasoning problems, and absurdities*. It is an ability to learn things by understanding the concept.

Modern age is called as the age of science and technology. It is also known as age of competition. In this competitive age, children are facing tough competitions in social and educational sectors which require parents as well teachers to help them for coping with life in a satisfactory manner. Children's ability to acquire knowledge and then use it effectively to plan, monitor and evaluate their own capabilities is better ensured during early years of life (Murlidharn and Asthana, 1991).

Hence, the present study has been undertaken with the aim to assess the mental ability of the school going girls with the following objectives :

### **Objectives**

To assess the *mental ability* of selected school going girls (7-11 years)

#### **Assessment of mental ability (five subtests/aspects) of school going girls**

- In *analogy*, majority of girls (31.67%) had low average level of mental ability.
- Regarding "*classification*" aspects of mental ability, it was found that majority of girls (31.67%).
- Majority of girls (35.00%) were having high average level of mental ability regarding subtest 3<sup>rd</sup> "*Number series*".
- Majority of both girls (35.00%) had average level of mental ability in the *reasoning problems* subtest.

- Mostly girls (28.33%) were having high average level of mental ability regarding *absurdities* aspect.

On overall basis girls (56.67%) were having high average level of mental ability.

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