**Raven`s Standard Progressive Matrices**

**Raven`s Standard Progressive Matrices [RSPM]**

**Aim:** To measure educative component of ‘g’ as defined in Spearman`s Two factor theory using Raven`s Standard Progressive Matrices.

**Basic Concept:**

Differences in the functioning of two individuals, dull vs bright, quick vs slow, adaptive vs non-adaptive etc. can be attributed to intelligence. But what is intelligence?

Many definitions have been given:

* Ability to adjust
* Ability to learn
* Ability to carry out abstract thinking

According to oxford dictionary, intelligence is the ability of perceiving, learning, understanding and knowing.

**Alfred Binet** was one of the first psychologists to define intelligence as the ability to judge well, reason well and understand well. “It seems to us that in intelligence there is a fundamental faculty, the alteration or the lack of which, is of the utmost importance for practical life. This faculty is judgment, otherwise called good sense, practical sense, initiative, the faculty of adapting one’s self to circumstances.”

**Wechsler** defined it as the global capacity of an individual to think rationally and act purposefully.

**Thorndike** had suggested three types of intelligence:

* **Abstract intelligence** – ability to deal with symbols, words, formulas and numbers
* **Social intelligence** – ability to deal effectively with people and capacity to behave in social situations.
* **Concrete/mechanical intelligence** – ability to deal effectively with machines and equipments.

**Charles Spearman** proposed two-factor theory of intelligence. According to this, intelligence consisted of general factor and specific factor based on factor analysis. The `G` factor consists of mental functions that are primary. In addition, individuals have specific factors too.

Louis Thurstone proposed the theory of primary mental abilities which staes that intelligence consists of 7 primary abilities, which are:

* Verbal comprehension
* Spatial relations
* Numeric abilities
* Perceptual speed
* Word fluency
* Memory
* Inductive reasoning

Harvard professor Howard Gardner has identified eight different types of intelligences that each individual has the capacity to possess. The idea of multiple intelligences is important because it allows for educators to identify differing strengths and weaknesses in students and also contradicts the idea that intelligence can be measured through IQ.

**Visual/Spatial** - Involves visual perception of the environment, the ability to create and manipulate mental images, and the orientation of the body in space.

**Verbal/Linguistic** - Involves reading, writing, speaking, and conversing in one's own or foreign languages.

**Logical/Mathematical** - Involves number and computing skills, recognizing patterns and relationships, timeliness and order, and the ability to solve different kinds of problems through logic.

**Bodily/Kinesthetic** - Involves physical coordination and dexterity, using fine and gross motor skills, and expressing oneself or learning through physical activities.

**Musical** - Involves understanding and expressing oneself through music and rhythmic movements or dance, or composing, playing, or conducting music.

**Interpersonal** - Involves understanding how to communicate with and understand other people and how to work collaboratively.

**Intrapersonal** - Involves understanding one's inner world of emotions and thoughts, and growing in the ability to control them and work with them consciously.

**Naturalist** - Involves understanding the natural world of plants and animals, noticing their characteristics, and categorizing them; it generally involves keen observation and the ability to classify other things as well.

**Assessment of Intelligence**

Standardized [intelligence testing](http://www.apa.org/topics/intelligence/index.aspx) has been called one of psychology's greatest successes. It is certainly one of the field's most persistent and widely used inventions.

Since Alfred Binet first used a standardized test to [identify learning-impaired Parisian children](http://www.apa.org/monitor/2009/01/assessment.aspx) in the early 1900s, it has become one of the primary tools for identifying children with mental retardation and learning disabilities. It has helped the U.S. military place its new recruits in positions that suit their skills and abilities.

In 1908, Alfred Binet gave the concept of Mental Age [MA] which is a subject`s intellectual development with respect to others of his/her age group. Chronological Age [CA] is the biological age.

IQ = MA X 100

 CA

**History and description**

It is the most common and popular test administered to groups ranging from 5-year-olds to the elderly. It is made of **60**[**multiple choice**](https://en.wikipedia.org/wiki/Multiple_choice)**items**, listed in order of difficulty that’s why it`s called progressive.  The original form of the matrices was first published in 1938. This test measures **abstract intelligence** of an individual

The tests were developed for research purposes. Because of their independence of language and reading and writing skills, and the simplicity of their use and interpretation, they quickly found widespread practical application. For example, all entrants to the British armed forces from 1942 onwards took a twenty-minute version of the SPM.

**Reliability**

Over forty studies dealing with the reliability of the SPM have been reported in the literature. They cover very wide range, many cultural groups and clinical as well as normal population. Results have been summed up in the table 1.1

|  |  |  |  |
| --- | --- | --- | --- |
| **Age Range [years]** | **SPM Retest Reliability** | **MHV Retest Reliability** | **Correlation between SPM and MHV Scores** |
| **13+ -1** | **.88** | **.87** | **.57** |
| **Under 30** | **.93** | **.97** | **.60** |
| **30-39** | **.88** | **.91** | **.51** |
| **40-49** | **.87** | **.98** | **.45** |
| **50 and above** | **.83** | **.90** | **.44** |

* MHV – Mill Hill Vocabulary Scale – companion measure to SPM and asses verbal reasoning ability in the general population.

**Validity**

The concurrent and predictive validities of SPM vary with the age, sex and the homogeneity of the sample and the conceptual relevance of the criterion to which the SPM will be related and the quality of its assessment. For English speaking children and adolescents, reliable correlation of SPM with the Binet and Wechsler Scales range from .54 to .86. Some American studies with the adults have yielded very high correlations between SPM and WAIS scores.

**Preliminaries**

Name:

Age:

Gender:

Class:

Place of conduction: Psychology Lab

Time:

**Materials Required**

SPM booklet, response sheet, SPM manual, pen/pencil

**Precautions**

1. Optimal conditions for testing were ensured before the test begun
2. Time of start and finish were noted
3. If the subject got stuck on a question, then they should move to the next question.
4. The tester should ensure that no question is left unanswered

**Rapport Formation**

Rapport was established between the subject and the tester, prior to the test so that he/she could feel comfortable and at ease. In such a state, she/he should answer the questions in a calm manner and any doubts should be cleared before starting the test.

**Instructions**

The following instructions were given:

1. This is a test which consists of a booklet containing 5 sets, each set has 12 items that sums up to be 60 items in total.

2. The difficulty level of the test increases progressively.

3. Attempt all the items.

4. Choose the correct item that you think is the right answer and write it on the response sheet.

5. If you have any doubt, then clarify it right now.

6. There is no time limit but try to finish as soon as possible.

**Test Administration**

After the instructions were given, the subject was asked to fill in the necessary details. The tester ensured that the instructions were clear and understood.

**Introspective report/Verbal Report**

The subject wrote “The first three sets were quite easy but gradually items became difficult and required high level on concentration. Towards the end I didn’t feel like completing the test.”

[You can write the introspective report given by your subject]

**Scoring**

The total no. of problems solved correctly were scored which was calculated with the help of the answer key. Thereafter, a single score is obtained by adding the total scores of the five columns. The percentile score and grade corresponding to this are noted down from the manual for analysis.

Discrepancy score – The difference between the score a person obtains on each set and that normally expected for his total score is called the discrepancy score shown numerically as:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sets** | **Set - A** | **Set - B** | **Set - C** | **Set - D** | **Set - E** |
| **Actual Score** |  |  |  |  |  |
| **Expected Score** |  |  |  |  |  |
| **DiscrepancyScore** |  |  |  |  |  |

**Total score:**

**Percentile:**

**Grade:**

**Interpretation**

The aim of administrating the SPM was to access the level of mental ability of the subject. SPM is a test of person`s capabilities of abstract reasoning at the time of the test. This is done by providing figures/patterns and measuring the ability to figure out patterns between them.

The subject`s raw score was \_\_\_\_\_\_\_ which corresponds to \_\_\_\_ percentile and grade \_\_\_\_\_.

**Conclusion[For Grade – 1]**

The subject`s score shows that he is **Intellectually Superior** as his score lies at **95th percentile** for people of his age group. This shows that he has the following characteristics:

* superior abilities to reason, generalize or problem solve, high intelligence
* learns new things rapidly
* very perceptive, good sense of observation
* wide range of interests, overwhelmed by many interests and abilities
* long attention span, sustains concentration on topics of interest, persistent

**OR [For Grade – 2]**

The subject`s score shows that he has **Above-AverageIntellectual Capacity** as his score lies between **90th Percentile- 75th percentile** for people of his age group. This shows that he has the following characteristics:

* Easily recognizes patterns
* Very good memory.
* Advanced reasoning skills
* More curious than most students. Asks a lot of questions

**OR [For Grade – 3]**

The subject`s score shows that he has **AverageIntellectual capacity** as his score lies between **25th Percentile-75th percentile** for people of his age group. This shows that he has the following characteristics:

* make judgments and form opinions autonomously
* better able to construct and handle abstractions
* They usually respond and relate well to parents, teachers, and other adults.
* They exhibit an intrinsic motivation to learn

**References**

1. NCERT Psychology Textbook

2. SPM Manual, Author – J.C. Raven

3. Baron RA 2001/Indian Reprint Psych

##### 4. [Michael Egan](https://www.researchgate.net/researcher/2022371912_Michael_Egan), [Mercury's Web: Some Reflections on Following Nature across Time and Place](https://www.researchgate.net/publication/249880444_Mercury%27s_Web_Some_Reflections_on_Following_Nature_across_Time_and_Place)

**Standard**

**Progressive Matrices**

**Sets A, B,C, D, E**

**Name: Date:**

**Place: Class:**

**Age: Gender:**

**Test Begun: Test ended:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item no.** | **A** |  | **Item no.** | **B** |  | **Item no.** | **C** |  | **Item no.**  | **D** |  | **Item no.** | **E** |  |
| **1** |  |  | **1** |  |  | **1** |  |  | **1** |  |  | **1** |  |  |
| **2** |  |  | **2** |  |  | **2** |  |  | **2** |  |  | **2** |  |  |
| **3** |  |  | **3** |  |  | **3** |  |  | **3** |  |  | **3** |  |  |
| **4** |  |  | **4** |  |  | **4** |  |  | **4** |  |  | **4** |  |  |
| **5** |  |  | **5** |  |  | **5** |  |  | **5** |  |  | **5** |  |  |
| **6** |  |  | **6** |  |  | **6** |  |  | **6** |  |  | **6** |  |  |
| **7** |  |  | **7** |  |  | **7** |  |  | **7** |  |  | **7** |  |  |
| **8** |  |  | **8** |  |  | **8** |  |  | **8** |  |  | **8** |  |  |
| **9** |  |  | **9** |  |  | **9** |  |  | **9** |  |  | **9** |  |  |
| **10** |  |  | **10** |  |  | **10** |  |  | **10** |  |  | **10** |  |  |
| **11** |  |  | **11** |  |  | **11** |  |  | **11** |  |  | **11** |  |  |
| **12** |  |  | **12** |  |  | **12** |  |  | **12** |  |  | **12** |  |  |
| **Total** |  |  | **Total**  |  |  | **Total**  |  |  | **Total**  |  |  | **Total**  |  |  |

|  |  |  |
| --- | --- | --- |
| **Time** | **Total Score** | **Grade** |
|  |  |  |

**Tested by:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Standard Progressive Matrices**

**Correct Answers**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item No.** | **A** | **B** | **C** | **D** | **E** |
|  |  |  |  |  |  |
| **1** | **4** | **2** | **8** | **3** | **7** |
| **2** | **5** | **6** | **2** | **4** | **6** |
| **3** | **1** | **1** | **3** | **3** | **8** |
| **4** | **2** | **2** | **8** | **7** | **2** |
| **5** | **6** | **1** | **7** | **8** | **1** |
| **6** | **3** | **3** | **4** | **6** | **5** |
| **7** | **6** | **5** | **5** | **5** | **1** |
| **8** | **2** | **6** | **1** | **4** | **6** |
| **9** | **1** | **4** | **7** | **1** | **3** |
| **10** | **3** | **3** | **6** | **2** | **2** |
| **11** | **4** | **4** | **1** | **5** | **4** |
| **12** | **5** | **5** | **2** | **6** | **5** |

**Percentile Norms**

|  |  |
| --- | --- |
| **Percentile** | **Age 13-25 years** |
| **95** | **55** |
| **90** | **54** |
| **75** | **49** |
| **50** | **44** |
| **25** | **37** |
| **10** | **30** |
| **5** | **25** |

**Interpretation of Results for RPM**

**Grade 1** – Intellectually Superior – If the score lies at or above the 95th percentile for people of his/her age group

**Grade 2** – Above average intellectual capacity – If the score lies at or above the 75th to 90th percentile.

**Grade 3** – Intellectual average – If the score lies between the 25th percentile and 75th percentile, if the score is greater than the median and 3 -, if the score is less than the median.

**Grade 4** – Below average intellectual capacity – If the score lies at or above the 25th percentile 4-, if the score lies at or below the 10th percentile.