



# Construction and Standardization of Verbal Reasoning Test

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## 1. Introduction

In the current era of competition, intelligence in every field is the key to success in any field. Today a person has to face many problems every day. Your knowledge, intelligency, attitude everything is necessary to face these problems successfully. So, the students of all standard must be providing some practice to develop knowledge, intelligency and attitude which will help them to face problems in future.

Verbal reasoning is a test of a skill rather than a test of learned knowledge. The subject allows a test to determine a child's critical thinking ability and their ability to use their own knowledge to solve a problem. Verbal reasoning will likely not be taught in school.

In present study, the researcher constructed a Verbal Reasoning Test for Grade IX students and standardized it.

## 2. Objectives of the Study

The objectives in present study are as follows.

1. To construct a Verbal Reasoning Test for students of Grade IX.
2. To standardize Verbal Reasoning Test for students of Grade IX.
3. To find out different types of reliability of Verbal Reasoning Test.
4. To find out different types of validity of Verbal Reasoning Test.

## 3. Construction of Verbal Reasoning Test

In present study, the researcher conducted following steps to construct Verbal Reasoning Test.

### 3.1 Construction of items

The first step of construction of research tool was to collect related items. The researcher took help of internet, research fellows and his guide to construct different items for different factors of verbal reasoning. The researcher also used different reasoning books for construction of items. Finally, 100 items were constructed at primary level. These 100 items were distributed in 11 different parts.

**Table 1: Primary form of reasoning test**

No.	Factor	Items
1	Classification	15
2	Word relation	10
3	Symbolic	10
4	Appropriate order	10
5	Blood relation	10
6	Direction distance	5
7	Word arrangement	5
8	Calendar	10
9	Word series	10
10	Numerical series	5
11	Clock	10
<b>Total</b>		<b>100</b>

### 3.2 Experts' Opinions

The researcher constructed primary form of Verbal Reasoning Test for secondary school students. This test was divided in 11 factors having 100 items. The researcher sent this test to different experts who are either research guides or faculty of education colleges. The main aim of this process was to know the suggestions of experts regarding tool, so that, it can be improved to achieve the objectives. The researcher individually met all the experts and obtained their suggestions regarding tool. As per the suggestions obtained, the researcher amended all the items and reconstructed the tool.

### 3.3 Preprimary piloting of tool

For pre-primary piloting of tool, the researcher gave reasoning test to 20 students of Grade IX selected from Ahmedabad city. The main reason of pre-primary piloting was to check the ease of student for providing responses to the items of test. Aim was to remove confusing items which were unable to understand by the students. The researcher carefully observed the students and noted down all the matters that might be difficult for student in providing responses of items. Later, the researcher amended all that items and reconstructed the test.

### 3.4 Primary piloting of tool

Primary piloting was conducted on 370 students randomly selected from population. These students were given Verbal Reasoning Ability Test to fill up. The students were given three hours to complete this test. After completing the test, respond sheets were collected and checked them. The scores of answer sheets obtained, were used in item analysis.

### 3.5 Item analysis

The researcher found discrimination value and difficulty value of obtained scores. According to discriminating value of item, the researcher rejected few items. Items having discriminating value less than 0.2 were rejected. Thus, 30 items which discriminating values are less than 0.2 were rejected. In final tool, 70 items were remaining in it.

### 3.6 Construction of final tool

After item analysis, there were 70 items remaining. Each item has four responses out of which only one response is true, another three responses are false. Each response is assigned with one mark. Thus, in final tool, total 70 marks are assigned. Factor wise items in final tool are mentioned in table below.

**Table 2: Factor wise items in final tool**

No.	Factor	Items
1	Classification	11
2	Word relation	8
3	Symbolic	8
4	Appropriate order	8
5	Blood relation	5
6	Direction distance	3
7	Word arrangement	2
8	Calendar	7
9	Word series	9
10	Numerical series	4
11	Clock	5
<b>Total</b>		<b>70</b>

### 3.7 Reliability of Verbal Reasoning Test

The researcher used different methods to find out reliability of Verbal Reasoning Test. The values of reliability obtained using different methods are mentioned in table below.

**Table 3: Reliability through different methods**

No.	Method	Reliability
1	Test-retest (Karl Pearson)	0.82
2	Split half (Spearman Brown)	0.72
3	Split half (Rulon)	0.78
4	Split half (Flanagan)	0.67
5	Guttman's split half	0.78
6	Cronbach's alpha	0.76
7	Kuder Richardson (KR <sub>20</sub> )	0.69
8	Kuder Richardson (KR <sub>21</sub> )	0.71

#### 4. Validity of Verbal Reasoning Test

Validity is the main extent to which a concept, conclusion or measurement is well established and possibly corresponds precisely to the real world. A refers to how good a measuring instrument is. In present study, the researcher found three types of validity of test.

##### 4.1 Face validity

A face validity refers to how a test is appeared to fulfil the objective for which it is constructed. If a test is appeared to measure for what it is prepared, it has a good face validity. In present study, the researcher sent constructed test to different research experts. Later, the researcher amended it as per the suggestions obtained from them. Thus, it is said that the test has a good face validity.

##### 4.2 Content validity

Content validity of a test refers the appropriateness of items constructed in it. As mentioned above, the researcher amended each of the items as per suggestions obtained from experts. The researcher changed or modified some items, some new items were added as per requirement and few items were left according to suggestions obtained from experts. Thus, researcher constructed test has a good content validity.

##### 4.3 Factorial validity

A factorial validity shows the inter-factor correlation of test. The Verbal Reasoning Test constructed by the researcher has eleven different factors. The researcher found correlation of each factor with other factor and whole test. The results obtained by this is represented in table below.

**Table 4.0**  
**Factorial validity of the test**

Factor	1	2	3	4	5	6	7	8	9	10	11	Whole
1	1	0.47	0.58	0.57	0.51	0.61	0.54	0.61	0.47	0.51	0.55	0.49
2	0.47	1	0.41	0.51	0.59	0.52	0.53	0.51	0.53	0.50	0.48	0.52
3	0.58	0.41	1	0.50	0.46	0.56	0.54	0.46	0.57	0.57	0.46	0.59
4	0.57	0.51	0.50	1	0.59	0.53	0.61	0.62	0.58	0.56	0.60	0.61
5	0.51	0.59	0.46	0.59	1	0.53	0.52	0.60	0.55	0.57	0.58	0.54
6	0.61	0.52	0.56	0.53	0.53	1	0.49	0.59	0.55	0.56	0.57	0.59
7	0.54	0.53	0.54	0.61	0.52	0.49	1	0.46	0.63	0.49	0.71	0.72
8	0.61	0.51	0.46	0.62	0.60	0.59	0.46	1	0.54	0.59	0.48	0.45
9	0.47	0.53	0.57	0.58	0.55	0.55	0.63	0.54	1	0.57	0.58	0.54
10	0.51	0.50	0.57	0.56	0.57	0.56	0.49	0.59	0.57	1	0.47	0.57
11	0.55	0.48	0.46	0.60	0.58	0.57	0.71	0.49	0.58	0.47	1	0.59
Whole	0.49	0.52	0.59	0.61	0.54	0.59	0.72	0.45	0.54	0.57	0.59	1

#### 5. Major Findings of the Study

In present study, the researcher constructed and standardized a Verbal Reasoning Test for Grade IX student. The researcher found reliability and validity of test using different methods. The major findings of this study are as follows.

1. The value of test-retest reliability was found very good which shows a good test-retest reliability.
2. The researcher found split-half reliability using three different formulas. The test was found having a good split-half reliability.
3. The research revealed a good reliability to be found using Guttman's formula.
4. The value of Cronbach's alpha is very good which revealed the test having a very good reliability.
5. The values of  $KR_{20}$  and  $KR_{21}$  shows a high reliability of Verbal Reasoning Test.
6. The test has a good face validity.
7. The test has a good content validity.
8. The values of correlation coefficients among different factorials show a very good factorial validity of Verbal Reasoning Test.

## 6. Conclusion

The main objective of researcher in present study was to construct and standardized a Verbal Reasoning Test for Grade IX students. The researcher conducted this research on Grade IX students of Gujarati medium schools selected from urban and rural area of Gujarat state. The researcher conducted all necessary steps in order to construct and standardize Verbal Reasoning Test. The researcher found different types of reliability and validity of test which confirm research tool with high reliability.

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