Chapter - 1
INTRODUCTION

Since the advent of Binet-Simon Tests, the production of psychological tests went on in the west and in many countries of Asia and Africa too. In India also different types of psychological tests were prepared for almost all levels of school and in many of the Indian languages. Slowly the people in various academic and vocational fields felt the need to use different psychological tests for the admission, placement or recruitment purposes. As a result purely psychological tests or tests of their likes started being used for vocational selection in banks, insurance companies, the armed forces, railways, various government offices etc. They are now also being used for entrance to technical and commercial institutes of higher learning.

Gujarat has been in the forefront in devising and using psychological tests for various purposes. Among the various types of psychological tests intelligence tests have mostly been coined for various stages of the educational ladder. The most popular stage in this regard has been grades VIII to X, perhaps because it is very convenient to administer psychological tests in high schools than at other stages of education. For the primary grades, very few tests of intelligence have been devised and those which were prepared in the past, have been out of print mostly.
Intelligence tests for grades V to VII prepared by C.L. Bhatt in Gujarati were largely used in the beginning but they have not been reprinted again. The result is there is barely any test of intelligence available in Gujarat even for the research students to use as a tool in their researches. The present investigator therefore, took upon herself to devise and standardize a verbal-nonverbal test of intelligence for Gujarati pupils studying in Std. V to VII.

**Statement of the Problem**

Preparation and standardization of a group test of intelligence in Gujarati for the pupils of standard V, VI and VII in the age group of 9 to 13.

As already stated the present work aims at constructing and standardizing a group intelligence test in omnibus form having both verbal and nonverbal subtests. The age range covered is 9 to 15 years and the academic level is Std. V, VI and VII.

**Objectives of the Study:**

1. To understand the concept of intelligence.
2. To construct an intelligence test in Gujarati for the pupils of Std. V, VI and VII.
3. To prepare instructions to conduct the above test.
4. To standardize the above test on the pupils of Std. V, VI and VII.
5. To set different types of norms for the test-
   - to determine age norms for the ages 9 to 14+
- to determine grade norms for Std. V, VI and VII
- to calculate areawise and zonewise averages
- to see if there is any significant sex-difference in the average scores of boys and girls
- to see if there is any significant difference among the average scores of different areas as also of different zones
- to plot a graph from the mean scores against ages
- to find the reliability and validity of the test
- to prepare a ready reckoner of IQs from scores and manual for the test.

**Definition of Terms**

1. **What is a Psychological Test?**

   According to Anne Anastasi, a psychological test is essentially an objective and standardized measure of a sample of behaviour.

2. A **group test** means a test so constructed as can be administered to a number of individuals at the same time.

3. **Intelligence** is meant as the ability to make successful and rapid adaptation to new situations and to learn from experience.

   It can also be understood as the capacity to integrate experience.

4. A **general intelligence** test is an intelligence test (commonly used as a synonym for a mental test), a non-specific term designating a composite test made up of parts that have been found empirically to correlate well with some practical indirect measure of intellectual ability, such as success in school.
5. **Intelligence Quotient (IQ).** It is the most commonly used device for expressing level of mental development in relation to chronological age; obtained by dividing the mental age (as measured by a general intelligence test) by the chronological age and multiplying by 100. (The chronological age is often fixed at a certain maximum, most commonly to sixteen years, when growth of intelligence due to maturation has been assumed to cease. Thus if 16 years were the maximum chronological age used, a testee whose actual age was greater than this would still be assigned an age of 16 years for purposes of calculating the IQ. The maximum chronological age for different tests varies from about 14 to 18 years).

6. **Deviation IQ** - The ratio IQ has been largely replaced by the so called deviation IQ, which is actually another variant of the familiar standard score. The deviation IQ is a standard score with a mean of 100 and an SD that approximates the SD of the Stanford-Binet IQ distribution.

7. **Sample** means a finite number of observations, individuals or units selected from these which comprise a particular universe for the express purpose of making an inference about the universe. It is often assumed to be representative of the total group or universe, of which it is a part, a general term referring to a group selected by any means to represent a population; for example random sample, cluster sample etc.
8. **Norms** means standard or criteria; for example test norms give information about the performance of a particular group on a particular test and thereby provide a set of criteria against which can be compared the performance of any individual taking that particular test.

9. **Grade norms** - Tables based on the performance of a defined grade group by means of which test scores can be converted into percentile ranks are known as grade norms.

10. **Standardization** - The establishment of fixed procedures for administering and scoring a test; and the establishment of norms for a test is called standardization.

11. **Raw score** - The score originally obtained from a test or other measuring device, the value or magnitude of an observation before it has been equalled to the number of items answered correctly is called raw score.

**Test for Primary Grades**

The reason why research students hesitate to take up standardization of psychological tests for primary grades is that it is very difficult to administer even group tests to such young pupils for various reasons. It is accepted as a fact also that the level of instruction is lamentably low in the primary schools run by municipalities or district school boards, especially in the rural areas. Many of the pupils in these schools do not attend school regularly, there is a high level of wastage and stagnation in these schools, and teachers, although almost all trained, do not somehow pay due attention to their work. So those parents who are enlightened or who understand the value of education
send their children to private primary schools paying large amount of fees. Many English
medium schools have sprung up in urban and semiurban areas to satisfy this need of
parents. Many Gujarati medium schools have also extended their lower end to primary
classes. Children going to such schools can take psychological tests satisfactorily. The
abolition of examination in some earlier grades like I, II and III to reduce dropouts has
adversely affected the standard of education. Many pupils of these grades do not even
know how to read and write and the teachers also follow the line of least resistance by
neglecting them. The situation is worst in rural areas particularly. When the pupils do not
know how to read and write even their names, how can psychological tests be
administered to them? It was observed during the standardization of the present test that
many pupils of Std. V and even VI were not able to write their names properly. Thus the
best way to use psychological tests in early primary grades is to administer individual
tests and group tests would not yield correct results.

Outline of the Present Test

With full knowledge of these conditions of primary schools in Gujarat, the present
investigator started preparing intelligence tests for grades V to VII. She decided to have
half the tests nonverbal and the remaining half verbal.

After studying various types of subtests devised by investigators in India and also
in the western English speaking countries, she selected six types and coined a number of
items for inclusion therein.
Three verbal and three non-verbal types of tests were selected as follows:

<table>
<thead>
<tr>
<th>Verbal</th>
<th>Non-verbal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Following directions</td>
<td>5. Series</td>
</tr>
<tr>
<td>3. Analogies</td>
<td>6. Conditions</td>
</tr>
</tbody>
</table>

The Preliminary Runs of the Tests

A number of items were prepared for inclusion in each of the six subtests. They were edited after taking opinions of teachers and expert test-makers. About six pupils of different levels of abilities were administered the tests under the supervision of the investigator, and after discussion with these pupils, the items were corrected to suit such pupils. This was the pre-pilot testing.

These six subtests were then printed as separate tests to be administered one after the other. The tests were then administered to pupils of Std. V, VI and VII of an average school in Ahmedabad, and the answers of the pupils were then examined. Tables of the correct and incorrect responses were then prepared with scores for each item. Time of the quickest and about five quicker pupils were noted down in each class. Facility value (difficulty value) of each item and its discriminating index were calculated and 13 best items of each subtest were selected for the final test. From the time noted during the preliminary run of the subtests, a liberal time limit of 35 minutes was determined for the final spiral-omnibus pattern of 78 items. 13 blocks containing 6 items of each type of subtests were then prepared and arranged in a spiral omnibus pattern.
Reliability and Validity of the Test

The reliability of the final form of the test was determined by -

i) Test-retest method
ii) Split-half method
iii) Rational equivalence method
iv) Analysis of variance method, and
v) Cronbach's Alfa

The various types of validity were determined by the prevalent methods.

i) The concurrent validity was estimated by correlating the scores on this test with those on (a) Ajay Pandya's test, (b) Desai verbal-nonverbal group test.

ii) The criterion validity was estimated by correlating the scores on the present test with (a) Teachers' opinion about the intelligence of pupils and (b) marks scored in the final examination of the grades.

iii) The factorial validity of the test was examined by the Principal Component Method of factor analysis of the inter-correlations of the six subtests.

iv) The construct validity of the test was assessed by analyzing the test items for the assumed constructs underlying them.

All coefficients of correlation were found satisfactory. The factors obtained by factor analysis and rotated by varimax rotation were identified.
Final Run of the Test

The reliable and valid test was administered to a big group of pupils of schools forming a representative sample. For this purpose, Gujarat was divided into five zones and in each zone one urban, semi-urban and rural schools were selected. All pupils in one class of each of Std.V, VI and VII were selected to form the norm group for the test.

The items of the tests were scored as one point for each correct item.

Norms - Average scores of age groups 9, 10, 11, 12, 13 and 14 and above were calculated. A graph of the age averages was drawn and corrected to determine norms for each age. Similarly grade norms were also calculated for Std. V, VI and VII. Average scores for urban, semi-urban and rural areas were also calculated. Since the urban and semi-urban averages were not significantly different, they were merged together. Zonewise averages were also calculated.

Gender differences between male and female pupils were not found significantly different. So the final ready reckoner of IQs from scores on the test was prepared as common for both genders, assuming 15 as the SD of IQs. Finally, a table of levels of IQs and their common peoples' nomenclature was prepared.

The pilot test, its translation in English, the final test, its translation in English and the manual of directions for administering the test with its translation in English are given as appendices.