CHAPTER 4

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Testing of Intelligence of Gujarati Children

Group tests of intelligence are available in Gujarati for measuring intelligence of children of Gujarat which is a state of India. The population of Gujarat according to 1961 census is 2,06,33,350.

Group tests of intelligence prepared by K. G. Desai and C. L. Bhatt cover the whole secondary school going population. We have some instruments for mental measurement at the primary school levels but they are not comprehensive. Stanford-Binet first revision was adapted by N. N. Shukla in 1949, and J. H. Shah is at present preparing a new adaptation of 1960 revision. No body has prepared or adapted a Wechsler type of test for Gujarati speaking children. The present writer therefore decided to adapt Wechsler Intelligence Scale for Children for them so that a modern tool may be available to assess the intelligence of Gujarati children of age group 5 to 15.

WISC consists of twelve sub-tests, six verbal and six performance, covers eleven age groups 5 years old through 15 years old, and gives wide scope for the display of testee's many sided personality by exposing him to various types of material. As a part of Stanford-Binet Scale was adapted by the writer for her M. Ed. dissertation, she was familiar with the principles of test adaptations in general and procedures for adaptation and
standardization of an individual test of intelligence in particular.

ADAPTATION : NOT AN EASY TASK

Adaptation is neither an easy task, nor equivalent to translation. First of all the American or the British tests are based on their environments which are altogether different from the Indian. Even ordinary things like dress, house, articles of everyday use, social customs, accepted social behaviour, ideals, everyday experiences, normal school experiences, experiences resulting from industrial development etc. are totally different. This renders the mere translation of foreign tests quite inadequate and if not impossible atleast undesirable.

Secondly, every language has its own niceties and models of expressions which can't be expressed through another language by mere translation.

Thirdly, every word has its specific significance, denotation and conotation in a particular language which can't be maintained by translation of the word. The exact translation may perhaps lose the original subtlety and significance of the word. Moreover, some of the words may not have exact equivalents in another language. The sentence pattern of a particular language has also
specific characteristics.

Fourthly the content of test-items of intelligence tests is usually based on school experiences of pupils and subjects they learn in school. The curricula and the courses of studies offered in India and other countries are much different and therefore the test based on the experiences of American or British children can't be adequate for the children of India.

Lastly the difficulty value of a test in one environment cannot be the same in another and therefore such an adapted test must pass through the whole process of standardization which involves lot of statistical work, fixation of norms and establishing reliability and validity. It is therefore to adapt a test making suitable changes for cultural differences and restandardize it than simply preparing a translation of the tests using foreign norms.

Basic Principles for Adaptation

While attempting an adaptation of a foreign test, the following points need to be kept in mind.

1. The successful taking of each test involves some specific mental functions and processes. The sub-items of one test usually require the same mental functions and
processes to some extent. The underlying mental functions of newly coined items should correspond to the original one as far as possible.

2. The unfamiliar content of the test should be replaced by the familiar one based on the testee's environment and experiences.

3. Proper names; names of animals, things, cities etc., and the names of articles, fruits, coins, vegetables, units of measurement etc. which are not within testee's experiences are to be replaced by the familiar ones.

4. The sentence patterns have to be changed in such a way that the underlying meaning remains unchanged. During this process some of the words which do not find exact equivalent may be replaced by a longer expression and some of the phrases may be expressed through a single word.

5. Unfamiliar words may be replaced by familiar ones.

6. Tests like 'Vocabulary' 'Proverbs' 'Sentence Completion' etc. have to be framed anew.

7. Verbal tests need to be changed in such a way that they suit the testees' development and experiences.
8. The scoring scheme and the scoring standards are to be modified in the light of data collected through an adapted scale.

9. At the initial stage an item is to be replaced by two or three newly coined items so that the experimenter later on gets chances for comparative evaluation and proper selection.

10. As far as possible the difficulty level of original items and replaced ones should be similar; yet the difficulty value of all the items should be established on the data collected through the preliminary runs.

11. On the results got through the pre-preliminary and first preliminary runs the reliability and the validity of the newly coined items should be established tentatively.

12. During the second and the third preliminary runs these established reliability and validity should be checked and rechecked.

13. The wording of the tests also need to be checked during these preliminary runs.

14. Specific time-limit for each item should be established on the analysis of the data obtained through the adapted test during the preliminary runs.
**Why Adaptation**

Desai is right in his argument when he says that if all the steps of standardization of a new test are also to be done in adapting a foreign test, why should one not construct an original test? (p. 37). Yet the case is different so far as the individual test of intelligence like WISC is concerned. WISC consists of six verbal and six performance tests. Performance tests naturally require few changes as compared with those required in verbal tests. The preparation of suitable, refined, reliable and valid material for the performance tests, is itself a big and hard task. Moreover in the light of the eleven age-groups - 5 years through 15 years - covered and the wide scope for the display of many sided personality given by WISC, its adaptation is desirable than preparing a new test.

**DESCRIPTION OF TESTS AND THE CHANGES MADE THERE-IN**

Inclusion of particular tests of intelligence in a battery depends upon the author's defined or implied view as to the nature of intelligence. Wechsler's concepts regarding the nature of intelligence is already discussed in chapter III. The choice of tests also depends upon the special requirements of the various types of scales - age
scales, point scales etc., and the age groups covered by them. As this is the adaptation of a test, the problem of selection of tests does not arise. While discussing the selection of tests for Adult Intelligence Scale, Wechsler states four procedures that were adopted in the final choice of tests. (p. 63).

1. Careful analysis was made of the various standardized tests of intelligence that were already in use. Special attention was paid to the type of mental functions measured, population sample selected, and procedures of reliability adopted.

2. Each test's claim to validity on the basis of correlations with other recognized tests and empirical rating of intelligence, were evaluated.

3. Tests were rated on the basis of clinical experiences.

4. Preliminary experimental work was done by trying out tests on several groups of known intelligence level.

WISC like WAIS contains the same type of 12 tests having different content. They are as follows:
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The first task was to study WISC manual with a view to making necessary changes suitable to Gujarati children and their environment. During the preliminary studies the broad fields and specific points where changes were found necessary were decided upon and fixed up. For the purpose
of discussion each of the above mentioned twelve tests can be divided into three parts.

1. Directions for administering the test
2. Test items or the problems to be presented to the testees and
3. Scoring system, scoring standards and essentials of acceptable answers.

CHANGES MADE IN THE DIRECTIONS FOR ADMINISTERING THE TESTS

1. Language

Following the basic principles of test adaptation first of all the names of all the twelve sub-tests were translated into Gujarati. The Gujarati names are mentioned earlier in this chapter. Secondly the directions for test administration were translated into Gujarati. As far as possible word to word translation was tried but following the basic and common-sense principles of translation the niceties of language or the underlying meaning for structural pattern were not sacrificed. Moreover the specific verbal instructions to be given to the testees were translated in colloquial Gujarati at the same time the stress, emphasis and feelings attached to them in the original battery were maintained. This process was carried
out for all the tests of the battery.

2. Item - Limit for 8+ Children

This is a unique feature of WISC. Most of the tests in WISC give specific item - limit from where the subjects of 8 years or more who are not suspected mental defectives are to be tested. If they pass the prescribed items successfully they are credited for the former items. If the subject fails on any of the prescribed item, he is to be tested on the former items and credited for only those on which he succeeds.

Thus the Information test is to begin from item 4 and if the subject passes items 4, 5 and 6, he is credited for items 1, 2 and 3. If any of these items is failed, the tester administers items 1, 2 and 3 before proceeding further. 8 years or older subjects are tested from item 4 on Arithmetic, item 5 on Similarities and Picture Arrangement, item 3 on Maze and Block Design and item 10 on Vocabulary. General Comprehension, Digit Span, Picture Completion and Object Assembly have no item - limit for any age groups. Coding A is for subjects under 8 years age and Coding B is for 8 years and older subjects.

In the light of the changed test items and sample of standardization these item - limits must be adapted
so as to suit Gujarati children. They must be fixed on the analysis of the data collected through the responses of Gujarati children and therefore during the pre-pilot and first preliminary runs all the subjects were tested from item 1.

3. Consecutive Failures

Another unique feature of WISC is the discontinuation of a test after the specific consecutive failures on its items. Thus the Information and Vocabulary tests are to be discontinued after 5 consecutive failures. General Comprehension, Arithmetic and Similarities are to be discontinued after 3 consecutive failures. Digit Span is to be discontinued after failures on both trials on a given series. Picture Completion is to be discontinued after four consecutive failures. Picture Arrangement, Block Design and Maze are to be discontinued after two consecutive failures. Object Assembly has no such limit and Coding being a speed test is imposed a time limit.

It is natural that such a complicated procedure adopted by Wechsler for American population cannot be straight away used with Indian children without preliminary try outs. Thus during the preliminary runs such limits were also dropped out, and the testees were tested on all the items of the scale.
4. Time-Limit Prescript

Most of the intelligence tests, though considered power tests, are allotted specific time-limit with a view to discriminating between the subjects of various intelligence levels. The logic behind the process is, more intelligent children get quicker insight and thus work more speedily. Among equally successful persons, one who takes less time in the completion of his work is more intelligent. Thus time-limit increases the discriminative value of an item.

Accordingly Wechsler has imposed specific time-limit on all the items of six performance tests together with the Arithmetic test. He avoided an over-all time-limit for any test. Thus the prescribed time limit for the items in Arithmetic ranges from 45 to 120 seconds. The time-limit for Picture Arrangement, Block Design, Object Assembly and Maze ranges from 45 to 75, 45 to 150, 120 to 180 and 30 to 120 seconds respectively. Coding A and B are exclusively speeded tests requiring 120 seconds each. Moreover bonus in terms of scores is allowed for rapid performance on the items of Picture Arrangement, Block Design and Object Assembly.

In view of the innovations and reinnovations made in the test-items and changed sample of standardization
such a complicated process of time allotment cannot be copied. It must be experimentally decided on the data collected from Gujarati children. Thus during the pre-pilot and pilot runs no time limit was imposed and all the testees were allowed to take as much time as they wanted to work on any item.

TEST ITEMS AND THE CHANGES MADE THEREIN

General Information

Army Alpha Examination furnished for the first time strong support for range-of-information as a good measure of intelligence. In WISC it consists of 30 questions formulated in order to tap the subject's range of information. Though the range of a man's knowledge is generally a very good indication of his intellectual capacity, the fact remains that the amount of knowledge which a person possesses depends in no small degree upon his education and cultural opportunities. In practice the value of an information test depends in a large measure on the actual items which are included in it. We can't enumerate universal principles governing "good" questions. In fact items should call for the sort of knowledge which an average individual with average opportunity may be able to acquire for himself. Looking towards the educational and environmental opportunities that are available to the normal
Gujarati children the following changes were made beforehand.

Thus the item,

1. "How many pennies make a nickel?" was changed to

   "ठले वस्ती मनोद रुपये मध्ये ?"

   "How many paise make a rupee?" because rupee is the standard currency unit of India.

2. While changing the item, "What are the four seasons of the year?" the writer was confronted with a problem as generally there are three seasons in India but each one is also divided into two, and so there are six seasons in a year. Moreover the names in both the groups are altogether different. Therefore with a view to selecting a better item the following two items were coined.

   "पृथु नी स्यार शुद्रो आय आये ?"
   "पृथु नी व त्रित शुद्रो आय आये ?"

   "What are the three seasons of a year?"
   "What are the six seasons of a year?"

3. Most Gujarati children hardly know the colour of rubies and therefore the item

   "What is the colour of rubies?" was tried out together
with the newly coined item viz.

"मोगराले कोंकी रंग कयोरी जोच इं?

What is the colour of 'mogra' flower?" White 'mogra' flowers are very common in Gujarat and they have only one colour, viz. white.

4. As sun-rise and sun-set are the common experiences for Indian children, the item

"Where does the sun set?" would be too easy and therefore was tried out together with the newly coined item

"सूर्यो दैरे की रंगणे जोच इं?

In which direction do we see the pole star?"

5. As there are three equivalent words in Gujarati for 'stomach' the item

"What does the stomach do?" was translated in three ways viz.

"अपेक्षा देख सु घम रहे इं?
"अपेक्षा देख सु घम रहे इं?
"अपेक्षा देख सु घम रहे इं?

"What does our stomach do?"

6. Since Gujarati children may not be conversant with
Shakespear's 'Romeo and Juliet' the item

"Who wrote 'Romeo and Juliet'?
was replaced by two items viz.

"Who wrote 'Shakuntala'?"

"Who wrote 'Uttara-Rama Charita'?"

'Shakuntala' and 'Uttara-Rama Charita' are the two well-known Sanskrit dramas written by two famous poets, Kalidasa and Bhavabhuti respectively.

7. The American Independence Day, naturally may not be easily known by Gujarati children and therefore the item

"What is celebrated on the Fourth of July?
was changed to

"Why is the Fifteenth of August celebrated?"
Fifteenth of August is the Independence Day in India.

8. The item,

"What does C. O. D. mean?
was changed to

"What do 'j' and 'u' written by merchants in their
accounts mean?"

'j' and 'u' are the symbols used by Gujarati accountants for credit and debit sections respectively.

9. The item

"How tall is the average American man?" was replaced by

"જે-એ યુક્તા સમારોધી જુદ્દા હતો?"

"How tall is the average Indian man?"

10. As we can't expect the knowledge about a country in South America from a Gujarati child, the item

"Where is Chile?" was substituted by the following four items with a view to selecting the best one.

"ફ્રાંસ કિન છે?" "Where is France?"

"સુડાન કિન છે?" "Where is Sudan?"

"ભાક્રા-નંગાલ કિન છે?" "Where is Bhakra-Nangal?"

"બિલાઈ કિન છે?" "Where is Bilai?"

The logic behind choosing these items is, France is one of the European Country, which had colonies established in India for about two centuries. Thus the curriculum of Indian history mentions it and we can include it in the information test. Sudan being an East-African nation
is physically nearer to India than Chile and therefore Indian children may be more conversant with it. Bhakra-Nangal is one of the biggest dams in the Punjab State in India and lastly Bhilai, situated in Madhya Pradesh in India is one of the biggest centres of iron and steel industry.

11. Since India adopted 'gram' as the unit of measurement for weight the item

"How many pounds are there in a ton?" was modified as

"এক বইক বাড়িতে কতটুকু ঘাতী?"

"How many grams are there in a kilogram?"

12. As Indian children are more familiar with the capital city of U. S. A. than with that of Greece the item

"What is the capital of Greece?" was changed to

"আমেরিকার রাজধানী কতু ক্ষয়া?"

"What is the capital of the U. S. A.?"

13. Indian children are not familiar with pine or fir trees the source for turpentine. The Gujarati children naturally may not possess the information based on it and therefore the question

"What does turpentine come from?" was replaced by the
question

"From where do we get gum?"

14. The item

"How far is it from New York to Chicago?" was replaced by

"How far is Bombay from Ahmedabad?"

Bombay, the capital city of the Maharashtra State, is one of the biggest cosmopolitan cities of India near Ahmedabad. Formerly, it was the capital city of Bombay State which included both Maharashtra and Gujarat. Gujarat State came into existence in 1960 after the bifurcation of Bombay State.

15. The question

"Who discovered the South Pole?" was tried out together with the newly coined item

"Who discovered the Law of Gravity?"

16. 'Labour Day' is not very familiar to Indian children and therefore the item
"When is Labour Day?" was tried out together with the newly coined items

"अंतर्राष्ट्रीय अभियान अबे ए?"

"शिक्षक दिन अबे ए?"

"When is Gandhi Jayanti?"
"When is Teachers' Day?"

Indians must know the birthday of M. K. Gandhi, the Father of Nation but suspecting it to be too easy the question regarding the birthday of the former Indian president Dr. Radhakrishnan who was a teacher and whose birthday is celebrated as a Teachers' Day all over India was framed.

17. The item

"What is a hieroglyphic?" was completely discarded in favour of the following newly coined two items.

"স্বাস্তিক কী এ?"

"ওম কী এ?"

"What is Swastik?"
"What is Om?"

Swastik is a symbol of welfare very well known to Indian children. Om is also a symbol representing the Highest Spirit and considered as a sacred symbol for Hindus.
18. The item

"What is a lien?" was converted into

"What is legacy?"

Thus due to the cultural and the environmental differences, 18 out of 30 items were either modified or entirely discarded in favour of the newly coined items. During the process of modifications best attempts were made to maintain the underlying mental functions and the field of content unaltered. The niceties of language were also maintained. Moreover whenever a doubt about the worth of the newly coined items was felt, the original item was replaced by more than one items with a view to selecting a better one at a later stage. At some places the original item was tried out together with the newly coined item. The previous arrangement of test items as per their difficulty values was not to be strictly adhered to as they were to be applied without time limit and responses of Gujarati children were to be utilized later.

General Comprehension

Questions included in General Comprehension Test depend on a certain amount of practical information and a
general ability of children to evaluate past experiences. They are popular with most of the authors of individual and group tests. They are found in Binet Scales, Army Alpha Tests, National Intelligence Tests and many other tests. Their presentation in group tests and in individual tests is quite different. In group tests, the subject is furnished with four to five possible answers from which he is required to select the correct one, i.e. it is a test of recognition, while in an individual test the question is put to the subject to which he gives his own answer, i.e. it is a recall test. Naturally it furnishes rich data about the subject's social and cultural background.

In WISC the test consists of 14 well designed questions. Wechsler terms it a test of common sense (p.68) and is right when he says "It is of interest to note that in the foreign adaptations of the scale the translators have not found it necessary to make any important changes either in the form or in the content of the questions" (p.69). During the adaptation slight modifications in the content of only two items were needed. Thus the item

1. "What would you do if you were sent to buy a loaf of bread and the grocer said he did not have any more?" was changed as
"What would you do if you were sent to a shop to buy curds and if the shop-keeper said he did not have any more?"

It will be seen from the changed item that only a phrase 'loaf of bread' is changed into 'curds'. This is because normally in Indian culture people do not go to buy a loaf of bread. Most of them prepare their bread at their homes; while to go to buy curds is very common in India.

2. Just as the Americans elect senators and congressmen for their parliament, members of Loksabha (Lower House) and Rajyasabha (Upper House) of parliament are elected. Thus the item

"Why do we elect senators and congressmen?" was modified as

"Why do we elect the members to both the Houses of parliament?"

These changes can be compared with those made in the form and content of about 18 items on the Information test.
Tests of arithmetical reasoning have long been considered good measures of intelligence and most of the intelligence tests include them in one or the other form. Moreover arithmetical problems can be easily devised and objectively evaluated. It is one of the three 'R's whose knowledge is considered necessary. They correlate highly with other academic subjects and tests of intelligence, and thus furnish accurate estimate of one's scholastic achievement. It being one of the school subjects, the testee's performance is likely to be affected by his education.

WISC Arithmetic test includes 16 problems to be carried out orally by the subject. Most of the changes made in the test pertain to the American proper nouns and the names of the American currency. Thus pennies and cents were changed to paise and dollars to rupees. While making these changes the prices of the commodities in India and Gujarat were also taken into consideration. Thus the item

1. "John had 4 pennies and his mother gave him 2 more. How many pennies did he have altogether?" was changed to

"रमेश घरे 4 पैसे खरी तनो अब तने पेसा तने पेसा तने पेसा अब तनो पेसे 2 पेसा अब तनो पेसे रुपए पैसा तने पैसा तने पैसा तने पैसा तने पैसा कितने पैसा तने पैसा तने पैसा तने पैसा तने पैसा तने पैसा तने पैसा तने पैसा कितने तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे तने पैसे
"Ramesh had 4 paise, his mother gave him 2 more, how many paise did he have altogether?"

Thus the proper noun John was replaced by Ramesh and pennies were replaced by paise. There is no need of mentioning other such items where only the proper nouns and the currency were changed.

2. The item,
"At 7c each, what will 3 cigars cost?" was modified as

"At 7 paise each, what will 3 match-boxes cost?"

Cigar was changed to match-box because Indian culture considers cigar something undesirable.

3. The item
"If you buy 3 dozen oranges at 30c a dozen, how much change should you get back from $1.00?" was modified as

"If you buy 3 dozen oranges at 3 rupees a dozen, how
much change should you get back from a 10 rupee note?"

4. Looking to the prices of pencils in Gujarat the item

"If 3 pencils cost 5c, what will be the cost of 24 pencils?" was replaced by

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"If 3 books cost 5 rupees, what will be the cost of 24 books?"

5. The environmental and cultural forces together with the
standard of living in Gujarat forced the modification of
the following item.

"If a taxi charges 20c for the first quarter mile and 5c
for each quarter mile thereafter, what will be the fare
for a two mile trip?" was changed to

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"If a rickshaw charges 20 paise for the first quarter
kilometer and 5 paise for each quarter kilometer there-

after, what will be the fare for a two kilometer trip?"

Wechsler prescribes some specific unique procedures for the administration of the Arithmetic test. Accordingly first three problems are to be presented with the help of the wooden blocks. Problems 4 through 13 are to be presented on separate cards, which the subject reads one at a time and solves.

Moreover all the calculations are to be carried out mentally and therefore neither pen nor pencil nor any other writing material is allowed. Even the use of bench and finger is discouraged.

The present writer followed this procedure strictly from the very beginning and tried to see its inadequacy, if any, during her test administration.

Similarities

This is a test of perceiving relations between words. It appears in different forms in many group and individual tests. The correlational studies have proved its worth as one of the most reliable measures of intellectual ability. At a first glance it seems to be a test of word knowledge influenced greatly by language; practical experience, however, has shown that sheer word knowledge is a minor factor affecting test performance. The important factor is an
individual's ability to perceive the underlying common elements and to bring them in a systematic conceptual thinking. Perhaps it is due to this fact that Wechsler has prescribed qualitative evaluation of the answers. The responses based on the superficial similarities are credited with one score and the responses pointing out the essential likenesses are credited with two scores. The test is said to be one of the best examples of the cognitive processes described by Spearman.

The test as it is presented in WISC consists of two types of items. (1) Analogies and (2) Similarities.

Analogies have four items to be presented to the testees in the form of incomplete sentences to be completed by them. They are -

1. "Lemons are sour but sugar is ________."  
2. "You walk with your legs and throw with your ________."  
3. "Boys grow up to be men and girls to be ________."  
4. "A knife and a piece of glass both ________."  

Similarities contains 12 paired items to be presented one at a time. Thus the testee is asked -

"In what way are a Plum and a Peach alike?"

It will be seen from these items that the first three ask for the opposites while items 4 through 16 ask for
similarities. Can it be psychologically fair to ask about two opposite mental functions in a single continuous test? Thus through the reliability and validity of the test especially for Gujarati children who are not conversant with such type of items was suspected, the changes were adjourned till the second run with a view to seeing its adequacy for our sample.

The cultural and the environmental differences compelled the changes in the following 4 pairs.

1. As Gujarati children can't be familiar with American fruits, the names were replaced by those of the well-known Indian fruits. Thus the item -

'Plum - Peach' was changed to

"🍊 - 🍊"

Orange - Chiku

2. The item

"Beer - Wine" was changed to

"🍺 - 🍷"

Toddy - Wine

Toddy is the sap of palm trees very common in South Gujarat.
3. "Piano - Violin" was changed to

"સ્વામી - વીની"  

Tambur - Flute  

These being the commonly used musical instruments were thought to be in the easy comprehension of Gujarati children. Tambur is a stringed instrument and flute is a pipe.

4. Indian adaptation to the measurement unit of metric system forced to change the item -  

"Pound - Yard" into  

"અખી - મીટર"  

"Gram - Meter"  

The direction for the administration of this test asks the examiner to complete the first two items for the testee in case he fails to answer or understand them correctly. With a view to looking towards its adequacy or otherwise the same procedure without any change was adopted during the first preliminary run.

Vocabulary -  

The size of a man's vocabulary is not only an indi-
cation of his schooling but is also an expression of his general intelligence, and that is why Vocabulary test is included in most of the test batteries. Its worth as a test of intelligence stems from the fact that the number of words an individual knows is the result of his learning ability and the range of ideas possessed. Both of these on their part depend on an individual's general intelligence. Furthermore words carry concepts behind them, and concept formation is no less dependent on intelligence. Man's vocabulary is necessarily influenced by his educational and cultural opportunities; but the nature of a vocabulary test minimizes it. The list of words included in a test consists of verbs, common nouns, material nouns, adverbs, adjectives etc., and the testee is required to define, explain or describe them. These processes are complicated enough to make the test a representative measure of intelligence.

The test is often valuable for the qualitative aspects of the verbal responses. The verbal responses given by a subject reflect his cultural milieu and discloses many aspects of his hidden personality. The test as a whole provides much data useful for clinical purposes. Semantic character of the verbal responses affords us a peep and insight into an individual's thought processes. All these aspects provide sufficient data for mental diagnosis.
The quantitative evaluation of the test does not take into consideration the qualitative aspects of the subject's responses. Once the subject shows that he knows the word he is credited with the score. Any recognized meaning is accepted irrespective of the elegance of language. General rule for acceptable meanings is to match the responses against those given in standard dictionaries.

WISC Vocabulary test consists of 40 words selected from American environment. The nature of the test renders its translation and adaptation for Indian children at least undesirable and unscientific, if not impossible. Accordingly an original test was devised.

With a view to selecting 40 words for the final test, 50 words were selected in the beginning through random method. A standard Gujarati dictionary "Sartha Gujarati Kosha" published by Gujarat Vidyapitha and printed at Navjivan Press, Ahmedabad was selected for the purpose. This dictionary consists of 900 pages and therefore the first word from each 18th page was selected. The rigorous adherence to the procedure resulted in a list having many unfamiliar words which were not known even to the 'superior adults.' The same was the experience when such an original test was prepared as a part of the adaptation of Stanford-Binet Scale - 1960 revision by J. H. Shah. Therefore though it was decided to select the first word, discrimination had to be used
regarding the easiest and the most difficult words. Thus whenever the first word was the easiest or the most difficult one, it was given up in favour of another selected from the same page. The selection was left to the common-sense discretion and was based on the pronunciation, abstractness, difficulty value, cultural content etc. of the word. Thus a list of 50 words was prepared in the beginning.

No modification was needed at the outset as to the directions for test administration.

**Digit Span**

It is one of the most widely used test of intelligence and is also included in an original Binet Scale and its revisions. It correlates poorly with other intelligence tests and is found one of the poorest tests of general intelligence. Its popularity may perhaps lie in the case of its presentation, evaluation and the specific ability that it measures. While arguing for the retention of the test Wechsler points out its diagnostic significance and its worth as a good test at the lower levels of intelligence. It is also useful in identifying persons who have organic defects, who work in anxiety or who are inattentive to their task.
In WISC manual the test for Digit - Forward starts with 3 - digit series and ends with 9 - digit series; the one for Digit - Backward starts with 2 - digit series and ends with 8 - digit series. The subject is given two trials on each series and therefore each series is provided with an alternate one. In case the subject fails on the first trial of any series he is given with the corresponding alternate series prescribed for the second trial.

Two practice series having 3 - digits each are provided as to the Digit - Backward test. Before actually starting a test, the subject is given a 3 - digit series. If he is unable to reproduce the digits in reverse form, the examiner speaks for him correctly and then gives a second 3 - digit series. However, if the subject also fails on this second example, he is started with Trial I of the 2 - digit series. Then the test is to be administered in its regular procedure.

The test was adopted with Gujarati translation as no need was felt for any change as to the content or procedure.

**Picture Completion**

The Picture Completion test as it is presented in WISC, is very similar to that of the Mutilated Pictures of Binet - Scales. It requires the subject to discover and name the
essential missing part of an incompletely drawn picture. Thus e.g. the subject is shown a picture of an umbrella without spokes and asked to indicate the missing part.

Like other tests, tests of this type have also formed part of many group tests. While adopting it for a group test, it presents many difficulties. Experience has shown that it is difficult to find suitable items for Picture Completion test. The choice of too familiar objects makes the test too easy, while otherwise the test becomes too difficult and sometimes calls for specialized knowledge.

The test is found to be a good measure of intelligence at the lower levels. Its assets lie in the fact that its repetition after short intervals has not shown significant practice effect. The abilities measured are perceptual and conceptual ones through visual recognition and identification of familiar objects. In order to identify the missing part, first of all the subject must recognize what the picture represents and then should identify the missing part, making himself sure that it forms the essential part of that particular object. Thus the subject is also required to differentiate essential from non-essential details. Naturally familiarity with the content of the picture counts in this process and therefore exclusive unfamiliar objects should be avoided as far as possible.

In WISC the test consists of 20 pictures, each one
having some important part missing in it. While adapting the test for Gujarati children the following pictures were dropped beforehand as their content were thought unfamiliar for the Indian children. The dropped pictures are those of

1. Fish minus dorsal fin and
2. Hat without hat-band

Gujaratis being vegetarian people hardly get chance to have a look at fish. Though European dress is mostly adopted by Indians, the Indian climate does not allow the use of felt-hat and thus Gujarati children are not conversant with felt-hat.

The pictures dropped were replaced by the following newly drawn two pictures having familiar content. The are:

1. Goat minus tail and
2. Kite without an arch.

Moreover as an American cow has no hump on her back, the picture of a cow without cleft in hoof was replaced by one representing an Indian cow having hump on her back.

According to the directions for test administrations if the subject fails to detect the omission in Picture 1, the examiner points out the missing part. He is helped similarly in case he fails in the second picture but he is not helped in any way from picture 3 onwards.
Moreover in case of the subject mentioning an unessential missing part for the first time, the examiner is directed to ask him about the most important missing thing; but he is not helped in case that occurs second time.

No change was made in this procedure during the adaptation and the directions were followed regourously while administering the test for the pre-pilot and the first preliminary runs.

Picture Arrangement

Picture Arrangement test consists of series of pictures which are to be presented to the subject in a disarranged form and when put together by the subject in the right order, they tell a sensible little story.

First used by DeCroly this type of test was tried out by Army psychologists in America without much success. The reason perhaps may be lying in its complicated scoring and the difficulties in getting good sequences.

It is said that the test, "Effectively measures a subject's ability to comprehend and size up a total situation." [Wechsler, 2, p. 75]. The effective carryover of the task presupposes the understanding and the grasp of the whole story beforehand.
Picture series of WISC consists of 12 such sets covering various levels of difficulty. The nature of the test, forces its dependence upon actual content pictured in it. 4 sets of pictures prescribed for the lower age groups - Dog, Mother, Train and Weight - depict the content and situation on international and universal background and therefore need hardly any change. The 5th set of pictures - Fight - to be used as a trial test represents also a common international theme and works as a link between the sets for the lower age groups and those for the higher age groups.

The remaining 7 sets of pictures depict the content and situation essentially on American background reflecting its environment and culture. Of course the sense of humour as it is presented e.g. in items 'Picnic', 'Rain' and 'Sleeper' have universal character. Out of these 7 sets the pictures of the following 4 sets were redrawn so as to reflect the content in Indian background.

1. Thus the item "Farmer" consists of 4 pictures. The first picture shows an American farmer planting the seeds, the second one shows the grown up plants with an artificial watchman in the midst of the plants and a farmer taking their care. In the third picture the happy farmer is seen looking towards the fully developed maize corn and the last picture shows the farmer driving his truck full of maize corn to the city.
The same content with Indian background is adopted for our purpose. In the process of adaptation instead of four, five pictures were prepared. Thus the first picture depicts an Indian farmer having put on Indian Dhoti and robe with an Indian turban on his head, planting the seeds in his field. The second picture shows the grown up plants with an artificial watchman together with the farmer taking care of the field. The original third picture was replaced by two newly coined pictures. Thus the newly coined third picture shows a farmer and his wife reaping and tying a bundle of the plants. The newly added fourth picture shows the farmer and his wife thrashing the corn in conventional Indian way. In the fifth picture the farmer is seen driving his wooden bullock-cart full of corn.

2. Four pictures of the item 'Picnic' were redrawn having Indian background and culture. No change was made as to the content of the story. Thus an American couple was replaced by a young Indian couple. A baked chicken that the couple was carrying in their basket was replaced by a food packet.

3. Five pictures of the item "Sleeper" were also redrawn with Indian background, culture and atmosphere without making any change as to the content of the story or the sequence. The American house and office were replaced by the Indian ones. The dresses were also changed so as to
represent Indian dresses. Even the emotional expressions shown on the faces of the characters were Indianized.

4. Lastly the item "Gardener" was changed so as to suit the Indian culture. The six original pictures present American situation to such an extent that the item cannot be adopted without making many changes in its details. Thus keeping the basic content unchanged five pictures were prepared so as to represent the familiar scenes. The first picture depicted a girl asking a young man to dig an earth. The second picture presented a young man digging the earth. The third picture showed him resting under a tree at noon. The fourth one presented him with a lamp in his hand, keeping a watchful eye on the situation and the last one showed him returning home.

Thus all the above mentioned 19 pictures were redrawn with Indian situation and Indian background.

The 12 sets of Picture Arrangement test contain 48 pictures in all. During the process of adaptation only 19 pictures were either changed or modified and redrawn. Moreover during this process of Indianization the sense of humour presented by the original pictures is retained. The fact correlates well with Wechsler's statement, "Nevertheless, taken as a whole, it was rather surprising to discover how few changes were introduced in foreign adaptations and translations of the test....... Cartoons
appear to have an international language of their own" (Wechsler, 2, p. 75).

The directions for test administration of Picture Arrangement, Block Design, Object Assembly and Maze are the most complicated ones. The following are some of the specific instructions to be given for the administration of some of the items of Picture Arrangement.

1. The pictures are to be presented in a disarranged form from the subject's left hand side. The order of presentation is prescribed by Wechsler by printing the numbers on the back of each card.

The first two sets of pictures - 'Dog' and 'Mother' - are the cut-up pictures which when arranged in a proper manner make the right figures.

2. Now the test administration starts with the demonstration on the first item - 'Dog'. The examiner first puts the cards in the disarranged order, then demonstrates the correct arrangement with loud explanation, then gathers them and again puts them in the order of presentation and asks the subject to put them in such an order as to make it look right. If the subject fails, the examiner demonstrates again but without verbal explanation. The subject is then given the second trial.

3. The correct arrangement of the cut-up pictures of
the second item, 'Mother' is also demonstrated in case the subject fails on it. He is given no trial after demonstration.

4. The nature of item 4 - 'Scale' - forces change in the instruction and the subject is asked to arrange the cards so as to tell a story. No demonstration is given in case the subject fails but demonstration is given as to the correct arrangement for the next item - 'Fight'.

Thereafter no such help is given.

5. The item - 'Fight' - works as an item for demonstration even for the subjects of 8 years and older. The item is not allotted any score.

Perhaps it is the inherent nature of Picture Arrangement which forces this type of complicated procedure where the instructions vary as to the specific nature of the item, its difficulty value and the age-group for which it is prescribed. The instructions to be given to the subjects can be shortened in case the subjects are found to have followed the task.

During the adaptation no change was made in the above mentioned procedure for test administration and the subjects were tested accordingly.
Kohs, the originator of the Block Design test, considered it a comprehensive measure of non-verbal intelligence. The later studies have proved this belief and the test now appears in many intelligence tests either in one form or the other. It is found correlating well with a variety of criteria of good measures.

The test provides open field to qualitative analysis. The way in which different subjects work provides learning situation and insight as to the working of various personalities. Like other performance tests this test also has diagnostic value which can’t be minimized. The test calls for the subject's ability to organize visual-motor controls.

The test as it is presented in WISC, consists of 10 designs, out of which 7 are to be formed with 4 blocks and 3 are to be formed by using 9 blocks. They are having all the sides painted red or white, or one-half white and one-half red. Thus the use of only two colours eliminates the possible disturbances and complications that may have been created by the inclusion of other colours. Moreover it also saves the subject from the unnecessary turning of the blocks in order to get the desired colour.

The culture-free character of the designs is not likely to be influenced by any social or cultural aspects and therefore need no change in its content during its adaptation.
for the Indian children. Thus no change was made in the
designs as they are presented in the WISC.

The directions for test administration asks the examiner
to demonstrate the models of the first three designs.

1. The test begins with the demonstration of the
examiner on the first design. He is asked to take four
blocks and arrange them as it is shown on the card. The
model is to be kept before the subject and other four blocks
are to be given to him to form the design like one that is
before him.

If the subject fails on the first trial, again the
demonstration is given by using the subject's own blocks.
After demonstration the subject's blocks are to be re-
shuffled and given to him for the second trial.

2. The second design is to be assembled behind the
screen and the model is to be presented before the subject.
The subject looks towards the complete model and tries to
make the one like that. If the subject fails in this first
trial, the design is to be duplicated before his eyes with
the help of his blocks. Then the same blocks are to be
reshuffled and given for the second trial.

3. In the third design the model blocks are to be
replaced by the Card 'C' having a red-white design on it.
The examiner demonstrates the model with the help of the
subject's blocks, gives verbal explanation as to the similarity between the model and the design on the card, reshuffles the blocks and asks the subject to form one like that on the card. If the subject fails on the first trial the demonstration is to be given again without verbal explanation.

Hence forward no help is to be given. Subjects who are 8 years or older are to be started from item 3; the younger ones are to be started from item 1.

A part of the complicated procedure is presented above with a view to showing that no change was made in this procedure for test administration during the adaptation. The procedure was followed rigorously. Thus no change is made either in the form of any design or in the prescribed procedure for test administration.

Object Assembly

The Object Assembly test requires the subject to put parts together into a familiar configuration. The test is found to have high discriminative value at the higher levels of intelligence. Like other performance tests, the value of this test lies in its qualitative and clinical merits. The examiner is able to see differences among individuals at their work and the various procedures through
The test consists of 4 items, viz. 'Manikin', 'Horse', 'Face', and 'Auto'. Each one is cut into many parts and the subject is required to put them together so as to form complete figures. The content and the material are so familiar and perfect, not only for the Gujarati children but also for any child in any country, that they need hardly any addition or modification. Thus the items and the material are adapted for Gujarati children without any change in the content or the form.

The WISC manual presents diagrams showing the specific arrangements for the lay out of the pieces of each item. While adapting the test no change was thought necessary in this procedure and therefore the prescribed arrangement for the presentation of the material was rigorously followed.

Coding

The test has its origin in the well-known Otis and Army Beta tests. In WISC it consists of two sections viz. Coding A and Coding B.

Coding A is prescribed for the children of Age groups 5 through 7 and Coding B is for those of the 8 years or older. In Coding A the subject is required to associate
various lines in varied positions (single, double, circle, horizontal, vertical) with geometrical figures (star, circle, triangle, cross and square). Coding B asks the subject to associate certain symbols with certain numerals. In both the tests keys are provided in the upper part of the printed tests. The subject looks towards the key and proceeds with his work.

It is exclusively a test based on speed and accuracy and is included in the battery because more intelligent work with more speed and much accuracy is called for by it.

The only change needed in this test was the transformation of English numerals into Gujarati ones.

In order to familiarize the subject with the task the test provides sample items which also works as shock-bearer. No change was made in this procedure too.

Mazes

The test is designed on the line of the familiar Porteus Maze test. It consists of one sample maze plus 8 mazes of increasing difficulty printed on two sides of a paper. The first two mazes present the match-stick drawing of a boy inside them while others have crosses inside them. The subject is required to start from this figure or a cross as the case may be, and to trace, with pencil, the way out side. The test presents a sample maze which is to
be worked out by the examiner.

As the test carries no environmental or cultural effect, there is hardly any need of changing the form of the item. No change was made in the administration of the test also.

The test is found to have good discriminative value at the various levels of intelligence. Being a performance test, it presents the situation in a concrete form and holds up the subject's attention easily.

The directions for test administration asks the subject not to take his pencil from the path while tracing it. If the subject makes an error and enters in a blind alley, he is not allowed to take his pencil from the path. He is asked to retrace the path and come back to the correct alley. No change was made in these directions at the outset.

CHANGES MADE IN THE SCORING SYSTEM

AND SCORING STANDARDS

WISC manual gives various scoring systems for various items on all the tests of its battery.

Some of the verbal tests viz. Information, Arithmetic and Digit - Span are scored either 0 or 1 depending on the
correctness or the incorrectness of the answers. This type of objective scoring is possible as the nature of the items insists on only one possible correct answer. The language of the answer is not taken into consideration.

The correct responses on the other three Verbal tests viz. Comprehension, Similarities and Vocabulary are scored at two levels viz. 1 or 2 depending upon the generalization and quality. Clarity of thought and richness of content are taken into consideration and credited. The WISC manual presents three appendices, corresponding to these three tests, for the criteria for scoring and for sample answers. They give general rules that are to be followed and the typical marginal sample responses which are to be scored 0, 1 or 2.

During the process of adaptation the tentative scoring system based on these principles was prepared. The sample answers were translated and other possible answers were thought out at the outset so that they can be helpful in later evaluation. Specific sample answers were also thought out and listed at all the levels of scoring for the newly coined items in Information, Comprehension and Similarities. Vocabulary being an originally prepared test, no sample responses were translated but the general scoring principles given by Wechsler for 2 - Point Responses, 1 - Point Responses and 0 - Point Responses were translated. A tenta-
tive list enumerating sample answers at all these three levels, based on the meanings given in standard Gujarati dictionaries was prepared in the beginning with a view to achieving objectivity later on.

The scoring of the responses on Performance tests is quantitative as compared with that of the Verbal tests which is qualitative to some extent.

The possible score per item on performance tests ranges from 0 to 9. The Picture Completion test is scored either 0 or 1 for the correct or incorrect pointing out of the missing part. According to the WISC manual, if a subject points to the correct missing part, but either fails to name it or names it incorrectly, he is given the score. On the contrary if he names the missing part correctly but points at an incorrect place he is penalised. These principles together with the others prescribed by Wechsler were followed serupulously.

The scoring of the items on other 5 performance tests viz. Picture Arrangement, Block Design, Object Assembly, Coding and Mazes depends mostly on the time taken by the subject to finish them correctly. Thus for example, if a subject completes an item 'Fire' within 1 to 5 seconds he gets the score of 7, but if he finishes it within 16 to 45 seconds he gets the score of 4. Similar ranges of time are given for other scores. Wechsler calls these as bonus
scores for speedy performance. The range of time and the range of scores varies from item to item and from test to test depending upon the nature of the task and its difficulty. The scoring of the items prescribed for younger children in these tests, does not carry any bonus for speedy performance. Different scores for the first trial and the second trial are also prescribed. Moreover Object Assembly test gives credit for partial correct arrangement. For example, if the subject arranges 'Manakin' test by omitting 2 legs he is credited with 2 points. The WISC manual gives all these complicated procedures and scoring system in detail. Though these things were translated during the adaptation, the final decision regarding the time limit, bonus scores, etc. were deferred to time when the analysis was done on the data collected through Gujarati population.

The Maze test gives time bonus for speedy performance and at the same time penalizes for the errors made either in terms of faulty entrances or in taking up the pencil from the paper. An appendix is provided in the WISC manual showing the blind alleys with dotted lines. Each entrance in these alleys is considered as an error. This procedure was adapted without change. Errors were evaluated as per the rules given by Wechsler. Similarly specific rules given for the scoring of Coding tests were also adopted as they are in the manual.
It will be seen from the discussion throughout this chapter, that though many changes are made in the contents of the tests to take care of cultural differences, the basic principles of test administration and scoring are not changed.