

PSYCHOLOGY OF INDIVIDUAL DIFFERENCES

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ON INTELLIGENCE

TERMAN MERRILL

“ Intelligence is a general ability and contains the capacity to reason, plan, solve problems, think abstractly ,understand complex ideas, learn fast and learn from experiences. It does not include rote learning of specific skills learned at school (reading, writing),it does not refer to skilled dealing with intelligence tests. It is a broad and deep capacity that refers to insight in ,and understanding of affairs in the everyday life. It helps to decide what has to be done ,and is distinguished from creativity, character ,personality and other traits.” (Neisser et al ,1996)/

Reference

Neisser,U.,etal.(1996).Intelligence known and unknown. American Psychologist,51(2),77-101

Historical development of intelligence testing can be classified into three distinct periods.

- PRE- BINET PERIOD
- BINET PERIOD
- POST BINET PERIOD

WEAKNESSES OF THE PRE-BINET PERIOD

- ✓ Intelligence was identified as the acuity of senses.
- ✓ Complex functions were not measurable
- ✓ Tests were too simple and limited to measure intelligence
- ✓ Fine mental abilities could not be measured with the help of physical sensory tests

“Intelligence is the completeness of understanding, inventiveness, persistence in a given task, and critical judgment” –Binet.

In other words, Binet’s conception of intelligence emphasizes three characteristics of the thought process:

- (i) Its tendency to take and maintain a definite direction;**
- (ii) The capacity to make adaptation for the purpose of attaining a desired end; and**
- (iii) The power of auto-criticism.**

Mental age was first defined by the French psychologist Alfred Binet , who introduced the intelligence test in 1905, with the assistance of Theodore Simon. following the introduction of a law mandating universal education by the French Government

He began developing a method of identifying "slow" children, so that they could be placed in special education programs, instead of being labelled "sick "and sent to the asylum.

Mental age is a concept related to intelligence. It looks at how a specific individual, at a specific age—usually today, now—performs intellectually, compared to average intellectual performance for that actual age, measured in time from birth. The physical age of the child is compared to the intellectual performance of the child. If a child can pass the tests suitable for 9 yrs. old, his mental age will be 9 yrs. whatever the chronological age may be.

He created an experiment that was designed as a test to be completed quickly and was taken by various ages of children.

As was expected, the older children performed better on these tests.

However, the younger children who had exceeded the average of their peers were said to have a higher "mental age" and those who performed below average were deemed to have a lower mental age.

Binet's experiments on French school children laid the framework for future experiments throughout the Twentieth Century.

Timeline

YEAR	TEST/AUTHORS	COMMENT
April 1905:	Development of Binet-Simon Test announced at a conference in Rome	
June 1905:	Binet-Simon Intelligence Test introduced	SIMPLE 30 ITEM TEST
1908 REVISION OF BINET SCALE	Binet and Simon	INTRODUCED THE MENTAL AGE CONCEPT

YEAR	TEST/AUTHORS	COMMENT
<p>1911 REVISION OF BINET SCALE</p>	<p>Binet and Simon</p>	<p>EXPANDED TO INCLUDE ADULTS</p>
<p>1916 Stanford Revision of Binet Simon Scale</p>	<p>Stanford-Binet First Edition by Terman</p>	<p>INTRODUCED THE IQ CONCEPT</p>
<p>1937 Stanford-Binet Second Edition</p>	<p>Stanford-Binet Second Edition by Terman and Merrill</p>	<p>FIRST USE OF PARALLEL FORMS (L AND M)</p>
<p>1960 Stanford-Binet THIRD Edition</p>	<p>Stanford-Binet THIRD Edition by Terman and Merrill</p>	<p>MODERN ITEM ANALYSIS METHODS USED</p>

YEAR	TEST/AUTHORS	COMMENT
1972 Stanford–Binet THIRD Edition	Stanford–Binet THIRD Edition by Terman and Merrill	SB-3 RESTANDARDIED ON 2,100 PERSONS
1986 Stanford–Binet FOURTH Edition	Fourth Edition by Thorndike, Hagen, and Sattler	COMPLETE RESTRUCTURING INTO 15 SUBTESTS
2003 Stanford–Binet – Fifth Edition	Stanford–Binet – Fifth Edition by Roid	FIVE FACTORS OF INTELLIGENCE INCLUSION OF VERBAL AND NON VERBAL DOMAINS AND INCLUDES FLUID REASONING.

Although successive revisions differed from one another and from the original scale but there is a body of features that characterize all versions of the revised scales.

1. Items and tasks are grouped on the basis of their difficulty beginning with easy items..
2. They yield a general global measure of intelligence rather than an analysis of separate special abilities He abandoned faculty psychology, and tested general intelligence, as a sum-total of mental processes, like memory, attention, imagination etc. and not as separate faculties. therefore unsuited for measurement of differential aptitudes.
2. The Tests have been constructed to maximize the measurement of a general factor and minimize the influence of group factors or separate abilities. .(G factor of Spearman)

- 4. The scales are grouped by age levels and measure mental growth of the subject.**
- 5. They are primarily a measure of scholastic aptitude, and heavily loaded with verbal ability, especially at higher levels.**
- 6. They are excellent for identifying children of abnormally slow development.**
- 7. They are administered individually by a skilled examiner and require high proficiency.**
- 8. The system of scoring in all Binet tests is tied to the age norms. A child's mental age indicates the age group for which his performance would be typical.**

❑ Second Stanford revision appeared in **1937**, known as **Terman-Merrill** revision.

❑ It consisted of two equivalent **forms—L and M**.

❑ The 1937 tests were less verbal at the lower levels, and the earlier emphasis on rote memory at the upper levels was corrected. Earlier Binet tests called for judgement, discrimination and attention.

❑ The number of items in Binet Scale of 1916 was 54, in Stanford revision it was 90, in 1937 revision each forms had 129 test items.

❑ The limit of mental growth in both Stanford revision and Terman- Merrill revision is 16 years. The age level after 14 years is called the average adult level, as equivalent to a mental age of XV. There are three more tests in order of difficulty, known as superior adult I, II and III, altogether there are tests for twenty levels.

This test differs from that of 1916 in many details, but it does not differ in its essential and basic conceptions. “The revision utilizes the assumptions, methods and principles of the age scale as conceived by Binet”(Terman and Merrill).They however regard it as a better standardized and more useful scale than its predecessors. The principle differences are as follows:-

- The 1937 scale has two equivalent forms(L and M),each of which contains 129 items as compared to 90 items in the first Stanford Binet scale.**

- Items that proved unsatisfactory in the original were eliminated and new ones were added.**

- The 1937 scale extends downward to the level of age 2 and upward through three levels of “Superior Adult”(Superior Adult 1,Superior Adult II and Superior Adult III)thus increasing its usefulness.**

- The levels below age 5 and above age 14 have been more carefully and validly standardized.**

- **Scoring standards and instructions for administering the tests are improved.**
- **From age 2 to age 5, this test provides groups of test items at half –year intervals. Thus, more accurate and more highly differentiating test results are obtainable .**
- **Groups of tests were provided at age 11 and age 13 that were absent in the 1916 scale.**
- **Although the 1937 scale is predominantly verbal in character, it does provide more performance and other non verbal materials at the earlier age levels, especially through age 4. In all of these , verbal ability is a factor to the extent that verbal directions must be understood.**

•“ The 1937 revision was standardized on a carefully chosen and extensive group of subjects. Its component members are regarded as more representative of the population”. (Terman and Merrill,1937)

However, only American born white subjects were used in the standardization of this scale, the total number being approx,3000.

•Whereas the maximum mental age attainable on the 1916 Stanford Binet was 19 years and 6 months, the maximum on the 1937 revision is 22 years and 10 months .

- A 3rd revision was published in 1960, it provided a single form (L-M) incorporating the best items from the two 1937 forms.
- The 1960 scale did not involve a re-standardization of the normative scale
- A major innovation introduced in the 1960 Stanford-Binet scale was the substitution of deviation I.Q.'s for the ratio I.Q. used in earlier forms. These deviations I.Q.s are standard scores with a mean of 100 and an SD of 16. The principal advantages of this type of I.Q. are that it provides comparable scores at all age-levels thus eliminating the vagaries of ratio I.Q.s.
- A second innovation is the extension of the IQ tables to include chronological ages 17 and 18 because retest findings indicated that mental development as measured by Stanford –Binet continues at least that long.

Why is the *Chronological Age* of an Adult

Considered to be 15?

“For our data, the yearly gain becomes relatively small by the age of fifteen and mental age shows but little tendency to improve thereafter. Chronological age beyond this point has therefore been disregarded in computing the IQ.

However, in keeping with the fact that age improvement ceases gradually rather than abruptly, we begin at thirteen years to disregard increasing fractions of successive chronological age increments.

From 13 to 16,we cumulatively, drop one out of every three additional months of chronological age and all of it after 16”.

Piaget’s stage of FORMAL OPERATIONS

(Terman and Merrill)

The appropriate chronological age divisors to be applied in computing IQs (Table 4 of Terman Merrill Test Manual)

ACTUAL C.A	CORRECTED C.A DIVISOR	ACTUAL C.A	CORRECTED C.A DIVISOR	ACTUAL C.A	CORRECTED C.A DIVISOR
13-0	13-0	14-0	13-8	15-0	14-4
13-1	13-1	14-1	13-9	15-1	14-5
13-2	13-1	14-2	13-9	15-2	14-5
13-3-	13-2	14-3	13-10	15-3	14-6
13-4	13-3	14-4	13-11	15-4	14-7
13-5	13-3	14-5	13-11	15-5	14-7
13-6	13-4	14-6	14-0	15-6	14-8
13-7	13-5	14-7	14-1	15-7	14-9
13-8	13-5	14-8	14-1	15-8	14-9
13-9	13-6	14-9	14-2	15-9	14-10
13-10	13-7	14-10	14-3	15-10	14-11
13-11	13-7	14-11	14-3	15-11	14-11
				16-0 and above	15-0

The C.A of the subject who is between the ages a 13-0 and 16 -0 is counted as 13-0 plus 2/3 of the additional months he has lived. This means that a true C.A of 14 is counted as 13-8; a true C.A of 15 as 14-4; a true C.A of 16 as 15-0 which is the highest divisor used in the computation of an IQ. (Table of Adjusted C.A)

The Computation of IQ:-

- Errors can occur in converting years and months into months.*
- Confusion arises in case of subjects in between age 13 and age 16.*
- We longer cease counting C.A abruptly at a given age but by degrees.*
- Upto 13-0 the entire C.A is counted, beyond 16-0, none of it.*

Intelligence Quotient or I.Q:

The ratio between chronological age and the mental age is called the intelligence quotient or the I.Q.

The formula is $I.Q. = \text{Mental age (in months)} / \text{Chronological age (in months)} \times 100$.

In the Terman-Merrill revision there are :-

- six tests for each six months from two years to five years. That is, each test is calculated to be one month in age.
- From six years to fourteen years there are six tests for each year. That is, the value of each test is two months. This is because, in case of children, the rate of growth is very rapid, so the value of each test is one month.
- In case of average adult level (AA) there are eight tests, each test is valued two months.
- In superior adult level (S.A.L.) there are six tests, each test is valued four months.

In this scale the maximum possible mental age is twenty-two years ten months.

Definition of *basal age*

Level of mental age at which all items in a standardized intelligence test can be passed. Specifically, it applies the Stanford-Binet intelligence scale

The mental age level at which all the items on an intelligence test can be creditably passed

CEILING AGE

The age level at which a child is unable to answer a standardized test correctly. It is the maximum level which a child can reach on a scaled like the Stanford-Binet . At this level, all items on a test are failed such that further testing is discontinued.

Chronological age

refers to the actual amount of time a person has been alive. In other words, the number of days, months or years a person has been alive

IS THE STANFORD BINET SCALE ADEQUATE AT THE ADULT LEVEL?

The standardization group of 1937 included individuals of 18 years but it did not include an adult population. Therefore the test items at the several adult levels rest upon theoretical considerations already mentioned, rather than upon actual samplings of adult performance. Perhaps, due to the methods used in standardizing the scale at the superior Adult Level, it has been frequently observed inadequacy with college students, who, as a group would be ranked above average. The inadequacy of the scale is especially marked when administered to very superior students, for it is not difficult enough at the higher levels of adulthood.

ADMINISTRATION

IQ	PER CENT	CLASSIFICATION
160-169	.03	
150-159	.02	VERY SUPERIOR
140-149	1.1	
130-139	3.1	
120-129	8.2	SUPERIOR HIGH AVERAGE
110-119	18.1	
100-109	28.5	AVERAGE
90-99	23	

IQ	PER CENT	CLASSIFICATION
80-89	14.5	LOW AVERAGE
70-79	5.6	BORDERLINE DEFECTIVE
60-69	2	
50-59	.4	MENTALLY DEFECTIVE
40-49	.2	
30-39	.03	

In order to secure a valid result in the use of the Stanford Binet Scales, three requirements must be satisfied.

1. The Standard procedures must be followed.

- **Control of Conditions**-The test method to the extent that it does control the conditions under which the behaviour is called forth, is an experimental method, and as such it yields results which are valid for the specific conditions in question. The procedure for giving these tests has been carefully standardized for each test situation and should be followed without deviation.

- **Avoidance of giving help**-One serious danger in even minor departures from the standard formula arises from the examiner's conscientious desire to see the child perform to the limit of his ability. It is never permissible to repeat the question after an unsatisfactory response is given, however sure the examiner may be that the subject is capable of answering correctly. The rule has, however one exception : if the subject's response indicates that a part of the formula has been misunderstood because of the examiner's faulty pronunciation or the subject's imperfect hearing, the entire formula is repeated.

▪ When in the **vocabulary test**, for example, a subject sometimes defines the word tap as “something you wear on your head,” it is obvious that he understood the examiner to say cap. Another difficulty arises when the subject gives a response which cannot be scored because of lack of clearness or ambiguity as to the meaning it was intended to convey. The situation is especially likely to arise in giving the vocabulary test. In order to bring out a scoreable response in such cases the examiner should say, “Tell me what you mean” or “Explain what you mean”

▪ **Order of presenting the tests**: the tests of each year group should be given in the order in which they appear in the manual and record booklet. If the child shows resistance towards a certain kind of test, such as repeating digits, drawing, etc., it is better to shift temporarily to a more agreeable task. When the subject is at his ease again it is usually possible to return to the troublesome tests with better success.

2. The child's best efforts must be enlisted by the establishment and maintenance of adequate rapport

In a subtle way like an understanding smile, an exclamation of pleasure, an appreciative comment or just the air of quiet understanding between equals that carries assurance and appreciation. However, he must avoid common practices of dragging out responses by too much urging or cross questioning.

3. the responses must be correctly scored.

- Detailed instructions of Form L and Form M are given in part II. It is very necessary for the examiner to acquaint thoroughly with the scoring rules laid down.

- The examiner must be free from prejudices of ungrammatical speech and be as willing to credit a correct response awkwardly expressed as one that is given in the best literary form.

Avoidance of Halo Effect

Each response must be judged independently with its own merits without being influenced by success or failures of other responses.

- **Scoring not purely mechanical**

Scoring of Binet tests can never be made as objective as the stencil scoring. A good many of the tests bring a response so near the borderline that the most competent examiners would not agree unanimously in scoring it. The remedy is to learn to score each test as nearly as the possible way it was scored in the process of standardizing it. Considerable practice as well as careful study of the instructions is necessary in order to acquire a ready skill.

**Credit in months at each level Total credit
(Manual of Terman Merrill pg 66)**

Level	Credit in months	No of Tests	Total credit
Average Adult	2 months	8	16 months
Superior Adult Level I	4 months	6	24 months
Superior Adult Level II	5 months	6	30 months
Superior Adult Level Iii	6 months	6	36 months

Basic Concept-

- **Binet's Definition**
- **Concept of IQ**
- **Types of intelligence**
- **Description of the test**
- **Basal Age and Ceiling Age**

Introduction

- **Historical Background**
- **Difference between Point Scale and Age Scale**
- **Age Norms**

□ *Psychological Testing-Freeman*

□ *Measuring Intelligence-Manual of Lewis M.Terman Maud A. Merrill*

□ *Question:-*

□ *Should we explain the concept of position of the subject in NPC?*

Thank You