

## What Else Do Intelligence Tests Measure

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### Abstract

It is a theoretical paper discussing briefly the history of intelligence testing. It describes the use of intelligence testing in the neurological area. Intelligence tests can find out the deterioration index in the victims of roadside accidents and can give some idea about the prognosis of neurological conditions. Never heard before, discrepancy in the performance of Kohs block and the Pass-Along tests may suggest epileptogenic personality [high chance of seizure disorder]. Children's Intelligence Scales, an abridged edition of MISIC can unearth parenting styles responsible for influencing learning and schooling in children. Performance on the Bhatia's Short Battery of Intelligence when administered on normal healthy subjects can suggest the ability to adjust in office family and marital competency in unmarried young girls.

**Keywords:** Children's Intelligence Scales; Unmarried Young Girls; Neurological Conditions

**Abbreviations:** IQ: Intelligence Quotient; ADHD: Attention Deficit Hyperactivity Disorder; LD: Learning Disability; ASD: Autism Spectrum Disorder; ODD: Oppositional Defiant Disorder; DQ: Deterioration Quotient; CIS: Children's Intelligence Scale; MISIC: Malin's Intelligence Scale for Indian Children; TQ: Test Quotients.

### History of Intelligence Testing

Interest in intelligence testing dates back to more than a century ago. But it wasn't until a school psychologist Alfred Binet (1857-1911) was asked by the France government to identify which students needed educational assistance that the first intelligence quotient (IQ) test was born De Boeck, et al. [1]. Binet in association with a physician Theodore Simon [1873-1961] developed, historically, the first intelligence scale in 1905 to identify school students in need of special education, this pioneering procedure was known as Binet-Simon Intelligence Scale. The test developed a series of tests designed to assess mental abilities. Rather than focus on learned information such as math and reading, Binet instead

concentrated on other mental abilities such as attention and memory. Although it has its limitations, Binet's IQ test is well-known around the world as a way to assess and compare intelligence. It also set the stage for the development of several of the IQ tests that are still in using today Michell J, et al. [2].

IQ tests are well known and are highly used psychological instruments the world over yet defining intelligence is a controversial issue. Once there was a hot discussion amongst scholars to decide its nature. After a long discussion, the participants unanimously agreed to disagree about its concepts but agreed intelligence was what the intelligence tests test [3-5] what intelligence tests measure was a set of responses to the auditory or visual stimuli given by the subject. In addition to assessing proficiency in schooling and the need for special education, intelligence tests were also developed for US Army recruits during World War I.

The Army Alpha and The Army Beta were group-administered tests. The tests were developed by Robert

Yerkes [6] and six others to evaluate the many U.S. military recruits during World War I. It was first introduced in 1917 due to a demand for a systematic method of evaluating the intellectual and emotional functioning of soldiers. These tests were group tests, meant for literate [Army Alpha Test, verbal] and for illiterate and foreign subjects- non-English speaking, Army Beta Test [nonverbal test]. These two tests were primarily to discriminate soldiers for Army. Army Alpha was used to determine a soldier's capability of serving, his job classification, and his potential for a leadership position. Illiterate or foreign-speaking [non-English speaking] recruits would take the Army Beta, the nonverbal equivalent form of the test. The Army discontinued the test after World War I [7].

## IQ Tests are Routinely Used in Medical/ Rehabilitation Areas

Intelligence tests are routinely used in the fields of medicine/ psychiatry/ rehabilitation to identify subjects suffering from intellectual disability [ low IQ, 70 or below] to qualify them to obtain a disability certificate that would entail them to obtain certain benefits pronounced by the state and central governments time to time. Subjects complaining of behavioral problems such as attention deficit hyperactivity disorder [ADHD], learning disability, [LD], autism spectrum disorder [ASD], and Oppositional Defiant Disorder [ODD], are also supposed to be tested for their intellectual functioning and chances for betterment. This is about 10% of the general population or nearly 15% of the clinical population visiting hospitals for remedial programs. In addition to this population where intelligence testing is done a sizeable subject consults the counselor for aptitude testing that also include intelligence testing.

## Newer Use of Intelligence Testing

### IQ as Neuro-Cognitive Assessment

- Victims of Roadside motor vehicular accidents when approaching the court for compensation, also require to submit credentials of loss of intellectual capacity along with other physical deficiencies. The greater the loss of intelligence greater will be the compensation. This assessment requires the utmost attention of the tester. He is supposed to decide the quantum of premorbid IQ and administer intelligence tests to find out current IQ points. Premorbid IQ can be decided by collecting a history of achievements in educational, occupational, and social areas. A difference between performance/ nonverbal and verbal IQs and the deterioration quotient [DQ] are other procedures to decide the decline in IQ that could be attributed to the accident [8].
- A senior citizen who has not operated his bank account

for a long period and now desires to operate it is also supposed to give a certificate of current intellectual functioning indicating the ability to take decisions independently.

- IQ tests can also help diagnose epileptogenic personality, if a subject finds difficulty in completing the first one or two designs of the Kohs' Block Design test and passes five or six designs of the Alexander's Pass-along test comfortably, indicates that the subject is likely to be suffering from epileptogenic personality [seizure disorder]. EEG in 80% of such cases is found to be abnormal [9].
- IQ test as prognostic indicators: if a case is referred from the neurology or neurosurgery services having brain disease or after a surgical intervention or head injury then compare his performance on Kohs Block and Pass-Along tests. If his Kohs block performance is significantly better than his performance on Alexander's pass-along then he is likely to have a good prognosis. If his performance on Kohs is poorer than Alexander's pass-along, than he is likely to have a poor prognosis. The reason is that Kohs is a measure of abstract, logical, analytic, and synthetic abilities. It is also related to new learning and accumulation. Whereas the pass-along is a measure of concrete/practical ability and the operational part of the accumulated energy. If analytic-synthetic abilities are retained then this ability can be used to furtherance his capacity through psychotherapeutic and cognitive retraining procedures to compensate for his loss. However, if the subject analytic- synthetic capacities are less than his capacity to profit from psychological would be poor indicating a poor prognosis.

### IQ Test and Psycho-Social Problems

- Adjustment capacity can also be assessed using intelligence tests. Kohs block and Pass along tests are powerful tests that can discover adjustment problems in the subjects having IQs above average [1SD higher]. This can also be ascribed to young unmarried girls as an indicator of marital competence/ incompetence [9]. Kohs block design test is a measurement of abstract/ logical, analytic, and synthetic capacity, whereas, the pass-along test is a measure of concrete reality orientation. If someone with above average IQ can pass comfortably the 9 or 10 design of Kohs Block and finds difficulty with the 6th design of Pass-Along then his adjustment in the office [workplace] and with colleagues is likely to be disturbed. The reason is, such an individual will be more concerned about his rights, he will be more argumentative in dealing with his seniors and juniors. The excessive argumentativeness may jeopardize his adjustment with others. If this type of person suffers from mental health problems he is likely to suffer from a

paranoid condition.

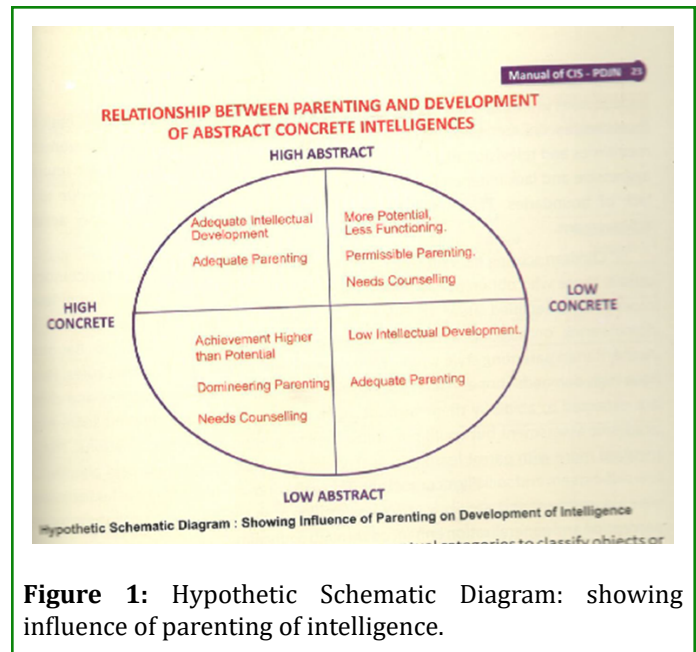
- Marital competence/ in competence index: if an unmarried young lady performs on Kohs block and passes along as above, then she is likely to face some problems in her new home. The reason being she would be more critical of the comments of other members of the family in the new home. She would be responding quickly to the comments rather than examining them logically and in social settings in which comments were passed. She would not wait to understand others in the new premises. This would create some misunderstanding among the members and would disturb the cohesiveness in communication. If the problem is identified earlier before the marriage then a few sessions of counseling may help her.
- IQ test and parenting style: IQ as measured on Children's Intelligence Scale [CIS] can give some insight into the parenting style [10] that affects the schooling of the child. The CIS was an abridged form of the Malin's Intelligence Scale for Indian Children [MISIC], and the MISIC [11] was an adaptation of WISC [12] the. CIS consisted of 6 subtests, two performances – Block Design and Picture Completion, and 4 verbal - Information, Comprehension, Arithmetic and Digit span. These 6 subtests were further grouped into three indexes- [1] Abstract Index; akin to fluid intelligence, measured by Block Design and comprehension, [2] Concrete Index; akin to crystallized intelligence measured by Picture Completion and Information, and [3] Numerical Index; akin to working memory measured by arithmetic and digit span subtests. Test quotients {TQ} for six subtests were adjusted for the Flynn effect [13-15].

The abstract index is the capacity to use conceptual categories to classify objects or ideas using their particular characteristics. It is an ability to think abstractly and to move between thinking about particular things and things in general. It is required in derivation, generalization, analysis – synthesis. It is similar to Cattell's fluid intelligence. A concrete index is similar to crystallized intelligence which is developed by training or experience. It relates to rote learning long-term memory and retrieval from stored material without generalization. It is required in routine work and schooling.

Based on abstract and concrete indexes a Quadrant model was developed that suggested that

- If a subject obtained a high score on all the six subtests and his abstract and concrete indexes were comparable then his intellectual development would be adequate, and he would be a person with adequate parenting.
- If he obtained low score on both indexes but comparable on both abstract and concrete indexes then he would be a person with low intellectual development with adequate parenting.

- If he secured high on abstract, and low on concrete then his intellectual development would not be optimal, had more inborn potential than being utilized and his parenting could be poor [named permissible parenting]. Such children and their parents would need counseling for the optimization of potential.
- If a subject obtains high on concrete and low on abstract then he would be excelling in academic/ memorizing without understanding logic and rationale, such a person is believed to have domineering parenting and would meet failure in a real-life situation (Figure 1).



**Figure 1:** Hypothetic Schematic Diagram: showing influence of parenting of intelligence.

### Other Usages Of Iqs and Derived Indexes

- If Performance IQ is significantly higher than Verbal IQ and Full Scale IQ is within normal range then the child should be interviewed to find out, if is he a case of learning disability or suffering from hearing impairment.
- If IQ is not within the average range, but his performance is better than verbal, he should be interviewed to explore features of autistic spectrum disorder.
- If there is a significant discrepancy in Verbal and Performance IQs, he should be interviewed in detail to find out any history of brain injury, fall from height, or attention deficit and deal accordingly.
- If a subject gets significantly higher [nearly 1 SD higher] on Abstract Index compared to Concrete, it may suggest that his available potentials were not optimized [unfolded/ unlocked] adequately and this might be due to poor ineffective parenting or poor home training. In such cases, interactive counseling as proposed by Jain N [16] and Pershad D [17] may be used to improve parenting or to discipline interaction through rescheduling daily

activities with family support.

- If a subject gets low on Numerical Index, he may be interviewed to explore, whether is he suffering from dyscalculia or induced fear of numbers by the parents [18].

It may also give some indication about parenting style as below and as depicted in the hypothetic schematic diagram [as above]

- Abstract > Concrete [Permissive: parenting style, parents do not want to upset child]
- Concrete > abstract [demanding/ nagging: parenting style with high hope from the child with strict obedience without realizing his emotional needs and intellectual potential]

## Summary

This theoretical write-up described the usages of two popular and time tested tests such as Kohs Block and Pass-Along tests of intelligence. The difference in performance on these well-known tests may indicate epileptogenic personality, prognosis in neurological cases, the decline in IQ after head injury and brain surgical intervention, and adjustment and marital competence in unmarried young girls. Children's intelligence scale meant for 6 to 16-year-old children [corrected for Flynn effect] is another test that can reveal parenting style and need for counseling in addition to the IQ of the child.

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