

Assessment of organicity in India

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ABSTRACT: Term organicity also refers to neuropsychological functioning that could be understood as a science of brain behaviour study. Each psychological functioning like cognitive, conative and affective mediates through central nervous system and brain therefore in general clinical practice it is called organicity. In a stimulus- response paradigm of psychology, processes of responding to a stimulus are reception, perception, consolidation and execution. Therefore, impairment of any of these processes may mark difficulty in the responses and in general behaviour of the human responses.

Key Words: Assessment, Organicity, India

Generally, in clinical sense, organic brain pathology refers to the pathological condition arising from structural, toxic [continuous abuse of drugs and chemical substances] or metabolic defects of the brain and manifesting in the form of impairment of orientation, memory, comprehension, calculation, learning capacity, logic capacity and judgment. All these problems together may be called problems related to intellectual function or cognitive function. In addition to this, There may also be disturbances of mood, lowering of ethical standards and exaggeration or emergence of personality traits and diminished capacity for independent decision. Thus following changes may associate with any brain pathology:

- Decline in fluid intelligence
- Decline in its speed of cognitive functioning;
- Disturbance in new learning and retrieval of information.
- Decline in ethical standards; more so lifting social/ libidinal inhibition
- Changes in personality traits
- poor logic and disturbance in connection of stream of thought
- difficulty in simple addition and subtraction

Generally, decline in cognitive functioning makes a person more disable and causes impairment in maintaining daily activities of life. Depending upon the nature and degree of brain pathology, his earning and decision-making capacities also declines to a great extent. To sketch the history of assessment of brain behaviour researches it will not be out of place to remember the names of Herman Von Helmholtz who worked on improving functioning of occipital lobe, minimum and maximum audible frequency of sound and worked on speed of nerve conduction [.....] and of FECHNER who published in 1860 voluminous treatises on 'Psychophysics'. Two point's threshold experiments in experimental psychology are still popular in psychological experiments. The systematic studies on brain behaviour in India, however, could not be thought of until the program was integrated in the university departments. Even the departments of psychology alone cannot demonstrate utility of brain behaviour researches without clinical psychology with practicum. Therefore, it is important to trace the history of psychology and of clinical psychology in India.

Development of Psychology in India:

In India, history of development of psychology is about 100 years old and development of clinical psychology is about 50 years old, as under:

1906, Calcutta University introduced experimental psychology in philosophy

1916, Calcutta University established department of psychology

1925, Indian Psychological Association was formed

1947, Indian Psychiatric Society became independent

1956, two years post MA in clinical psychology started at NIMHANS, Bangalore

1962, post MA course started at CIP, Kanke; Ranchi

1968, Indian association of clinical psychology formed

1974, Indian journal of clinical psychology started from Chandigarh

1993, RCI-Act promulgated

1995, RCI started monitoring standard and objectivity in clinical psychology

Institutes for Training in Clinical Psychology in India:

- 01) National Institute of Mental Health and Neurosciences, Bengaluru
- 02) Central Institute of Psychiatry, Kanke, Ranchi
- 03) College of Allied Health Sciences, Kasturba Medical College, Manipal
- 04) Ranchi Institute of Neuropsychiatry and Allied Sciences, Kanke, Ranchi
- 05) Regional Institute of Medical Sciences, Imphal, Manipur
- 06) Postgraduate Institute of Behavioral and Medical Sciences, Raipur
- 07) Institute of Human Behavior and Allied Sciences, Jhilmil, Delhi
- 08) Ramchandra Medical College and Research Institute, porur, Chennai
- 09) University College of Science & Technology, Kolkata
- 10) Sweekaar Academy of Rehabilitation Sciences, Secunderabad
- 11) Amity University, Noida
- 12) Amity University, Rajasthan, Jaipur
- 13) Gujarat Forensic Science University, Gandhinagar
- 14) Government Medical College and Hospital, Chandigarh
- 15) Pt.BD Sharma PGIMS, Rohtak
- 16) Government Medical College, Srinagar
- 17) KG Medical College, Lucknow
- 18) Institute of Mental Health and Hospital, Agra
- 19) SCB Medical College, Cuttack- Odish
- 20) Gautam Budha University, Greater Noida

Various terms used for evaluation of organicity:

The use of term will largely depend upon the purpose for which one is concerned and the authority one is professing. As an applied psychologist, largely, brain behaviour researches are concerned with psychiatric disorders including diagnosis, management and training for rehabilitation. Following three, terms are more popular in behavioural sciences.

- Neuro psychological test batteries
- Cognitive assessment
- Cognitive psychiatry

Neuro psychological test batteries are based on the assumption that the brain has differential functions and different structures of the brain are responsible for different functions. Morgan has probably rightly stated ' we find it natural to say that people are different in the measurement of personality, intelligence or some other aspects of the behaviour but we often seem to assume that the brains are standard product tinned out on an assembly line so that they look like as much alike as new cars. The fact is that brains vary a lot in their size, shape and function. These test batteries ignores the brain mechanism like, adaptability, equipotentiality and compensatory. These batteries are time consuming and good for theoretical research purpose than for practical purposes. Central Institute of Psychiatry, Ranchi and Ranchi Institute of Neuro Psychiatry and Allied Sciences, Ranchi are working on Luria-Nebraska Neuropsychological Batteries now for the last About 25 years and encouraging doctoral research work on this tool. Dr. Ashima Nehra from All India Institute of Medical Sciences, Delhi, is also working for the last ten years to develop aphasia battery.

Cognitive assessments are based on; practical aspects of behaviour including validated concept of intelligence, memory attention concentration, etc. PGI Battery of Brain Dysfunction is using this concept. Author in collaboration with his colleague reviewed the literature from 1974 to 1988 to find out what psychological parameters are assessed to describe cognitive dysfunctions in neurology – head injury cases, epilepsy, cannabis abuse, gases inhalation, long term use of lithium etc. these studies have used intelligence tests, memory tests, perceptuo-motor function tests and NIMHANS Battery.

Cognitive psychiatry is another term mentioned by Dalal and Sivkumar [2010] who said that cognitive researches had huge potentials in India and can help us to unravel mysteries of the human mind. They presented web-based review accessed through Google scholars and PUBMED search from 1980 onward tracing beginning of cognitive psychiatry in India. Authors based on their review concluded that cognitive abilities are assessed in wide varieties of psychiatric disorders. The first study in India, however, was published in the year 1966 by Murthy et.al, on the result of ECT on intelligence and memory in schizophrenic patients.

History of development of tests for organicity:

There are three main comprehensive test batteries in India. These test batteries are presented below in their chronological order of development:

- [1] PGI Battery of Brain Dysfunction [Pershad, D and Verma, S K, 1990]
- [2] AIIMS Comprehensive Neuropsychological Battery in Hindi-Adult Form [Gupta Surya, 2000]
- [3] NIMHANS Neuropsychology Battery [Rao, Subbakrishna, Gopukumar, 2004]
- [4] NIMHANS Neuropsychological Battery for Children [Kar, Rao, Chandramouli and Thennarasu, 2004]

These three batteries were developed working with psychiatric and neurological patients in India. The development of the tool took more than a decade in each case. The funds were made available from different funding agencies in India for the development and conduct of standardization process. Each of the battery has used the name of the institute where these were developed and standardized.

Except for PGI Battery, other two are time-consuming process and there are no short cuts.

PGI Battery is published by a test publisher of renowned and is priced low to enable the users to purchase and make use of it in their clinical practice and research.

AIIMS Battery is published by the author and is priced heavily that restricts its routine use in practice. Author of the test trains the user of the battery personally.

NIMHANS Battery is published by the institute itself and is commendably low priced. However, the standardized test material of the battery is not available only published manual is made available. This restricts its use.

Do we need a test for organicity?

All comprehensive neuropsychological test batteries developed over sea or in India are focusing on the localization of the lesion. This is probably a concept from Luria-Nebraska or Halstead-Reitan Test Batteries that were developed before the invent of radio diagnostic procedures such as [1] Computerized Axial Tomography [CAT], [2] Magnetic Resonance Imaging [MRI], [3] Positron Emission Tomography [PET] and other. At that time, psychological procedures were considered non-invasive [non-traumatic] procedure of getting an idea about the site of brain lesion. Procedures had significant role in the assessment of neurological and psychiatric cases.

Now the scenario had changed. The cognitive test batteries are more useful in assessing cognitive deficit or deterioration in psychological functioning for compensation in the roadside accident cases, to understand the course of chronic mental illnesses and to study the outcome for rehabilitation/ cognitive training.

Approaches for assessment of brain pathology:

two main approaches are described by pershad and verma,[1990] in their popular book on PGI Battery of Brain Dysfunction:

- [1] Multi-factorial approach
- [2] Unitary approach

<u>Multi-factorial approach</u>	Unitary approach
Based on the assumption of functional autonomy of the structures	Based on the assumption of functional unity of the brain as a whole following mass action and equipotentiality mechanism of the brain
Assessed by comprehensive batteries such as Luria-Nebraska, Halstead-Reitan, NIMAHANS, AIIMS batteries.	Assessed by the psychological tests of unitary functions such as test of intelligence, memory, perceptuo-motor function, etc

Misconception of brain behaviour:

There are various misconceptions about function of brain even in professional. some of misconception are like (a) All brain pathologies are demonstrable on available clinical investigation, (b) All behaviour follows STIMULUS-RESPONSE [R- S] pattern, (c) Brain behaviour theories are facts, (d) All brain pathologies can be quantified, (e) Brain pathology causes fall in behaviour, (f) Assumption of normalcy in intelligence/memory/behaviour/ethical standard pre-morbidly

Necessity for assessment:

Scientific development and psycho-socio-politico-cultural development may make the advent of the past only a matter of historical importance not of practical utility in present era. This belief may also be applied

with regard to the evaluation of the brain pathology through psychological tests. There was a time when a suggestion for brain pathology was required from the psychological testing procedures. Now psychological testing is not required for the evidence of brain pathology rather testing is required for cognitive/brain dysfunction. Neuropsychological testing has now become an important ancillary procedure to neurological diagnostic evaluations [Heaton and Pendleton, 1981]. They rarely consider the results of such psychological testing sufficient to make diagnosis, but their role has increased in the understanding of the patients for total management for providing rehabilitatory measures. Cognitive dysfunction is currently used for the following purposes:

- [1] Extend and nature of cognitive dysfunction for planning cognitive training.
- [2] For planning home based training for the patient and counselling for the family
- [3] Helping family members to develop insight into the illness, prognosis and outcome
- [4] Collecting evidence for suggesting costly investigation
- [5] To evaluate the effect of therapeutic processes
- [6] To assist judiciary to decide quantum of compensation after roadside accident or trauma
- [7] To evaluate extend of dysfunction for certification of disability for state benefits

Testing procedures developed in India:

There are number of psychological tests batteries have been developed/ standardized in India using concept of dysfunction. A few of them are based on well recognized concept of higher brain functions like functioning intelligence, estimation of past intelligence, memory functioning, perceptual acuity etc [Pershad & Verma, 1990]. Others are based on neurological examinations and follows evaluation of functioning of hemisphere and lobes [Gupta, 2000 and Rao et al 2004]. Some of the significant test batteries published during the last about two decades in India are given below:

[A] PGI Battery of Brain Dysfunction. [1990, Second edition 2007] By Dwarka Pershad and S.K.Verma.

This battery includes five tests viz. Bhatia's Short Scale, Verbal Adult Intelligence Scale, PGI Memory Scale, Bender Visual Motor Gestalt Test and, Nahor Benson Test of Perceptual Acuity. All these tests are fully validated and widely acclaimed through out the world. Norms are developed for 20 to 50 years age group; following factorial sampling design of 2 X 3 X 5 [two levels of sex, three levels of education and five levels of age]. It gives global rating of cognitive dysfunction based on 19 test variables and estimates well accepted/validated psychological concepts of (a) intelligence, (b) memory and (c) gestalt formation or perceptual acuity. It provides a profile of current cognitive functioning of the subject.

[B] AIIMS Comprehensive Neuropsychological Battery in Hindi [Adult Form] by Surya Gupta et al [2000].

This comprehensive tests battery is largely based on Luria-Nebraska Neuropsychological Battery and potentially useful for both diagnosis and rehabilitation. It consists of thirteen basic scales- Motor Scale, Tactile Scale, Visual Scale, Receptive Speech Scale, Expressive Speech Scale, Reading Scale, Writing Scale, Arithmetic Scale, Memory Scale, Intellectual Processes Scale, Left Hemisphere Scale, Right Hemisphere Scale, Pathognomonic Scale and Total Score Scale. It consists of 160 items. It is claimed that it is an ideal psychological instrument for clinical and research settings facilitating identification, lateralization and localization of brain lesions, in the subjects from 15 to 80 years of age.

[C] NIMHANS Neuropsychology Battery - 2004 by Rao, Shobini L, et. al [2004].

There are 19 tests in all, which measures 15 functions, in seven neuropsychological domains such as: Speed, Attention, Executive functions, Comprehension, Verbal learning and memory, Visuo-spatial construction and, Visual learning & memory. The sub tests used in the battery include, [a] Finger Tapping Test [b] Digit Symbol Substitution [c] Color Trails [d] Digit Vigilance [e] Traids Test [f] Controlled Oral Word Test [g] Association Test [h] Animal Names Test [i] Design Fluency Test [j] N Back Test [verbal and visual] [k] Self Ordered Pointing Test [l] Tower of London Test [m] Wisconsin Card Sorting Test [n] Stroop Test [o] Token Test [p] Auditory Verbal Learning Test [q] Passages Test [r] Complex Figure Test and [s] Design Learning Test. Normative data has been established for adults in the age range of 16 to 65 years following a factorial sampling design. A separate manual has been published under the name of NIMHANS Neuropsychological Battery for Children by Kar, Bhoomika R, et al [2004] for the children in the age range of 5-15 years.

[D] Measurement of Organic Brain Dysfunction [kapoor, 1978] this test battery is not published and the material required is not available. This battery was published as a research article. Thus, it is not in use.

Tests of unitary functions:

There are a number of other simple, internationally well-known and popular tests, widely used in India for research purposes and for a quick clinical impression. These tests are assessing unitary function of the brain

and gives impression about the lesion in the parieto-occipital region in general. Name of some of these tests are given below for the benefit of those who are pursuing research work. Detail of these tests can be had from any standard reference/source book on psychological testing. Other tests that are frequently used in India for the diagnostic profile of organic brain dysfunctions include- Wechsler's Intelligence Scale [both verbal and performance tests], PGI Memory Scale [Pershad, 1977], Wechsler's Memory Scale [Wechsler, and Stone, 1945], etc.

*Bender Visual Motor Gestalt Test

*Benton Visual Retention Test

*Nahor and Benson Test of Organicity

*Hooper's Visual Organization Test

*Graham Kendall Memory for Design Test

*Stroop Color and Word Test

*Trail Making Test

*Set Test

*Wisconsin card sorting test

No one can answer as to which test need to be preferred in clinical practice. It all depends upon the purpose in hand and the time available to the clinician for the evaluation. One thing is sure that before using comprehensive NIMHANS and AIIMS batteries one should have undergone some training under supervision or with ones own efforts to have workable confidence. Tests of unitary functions and those included in the PGI Battery however, do not require much training. Aim of the author here was not to critically evaluate the neuropsychological tests and batteries, rather to provide only the information because many of these batteries and tests have not yet been included in the standard text books of measurement specially the three-test batteries that were developed in India

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