So Many Troubled Children, So Little Time, and So Many in the Prison: A Neuropsychological Inquiry

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Abstract

The incredible and honorable responsibility of raising children is becoming more and more scary and overwhelming for many patients as more and more disturbed and dangerous children roam our streets. Those who will become their victims are countless. As many of them are put in prisons, still many more are at risk of despicable delinquent and mischievous behavior. As one time mom’s “sweetheart” drops out of school, turns to drugs, picks up guns to kill, rape people, and break homes and shops, many dedicated and conscientious parents whose children are involved would turn around and ask, “Where did we do wrong?” “What did we not do?” “We taught we did everything right!” These are soul-searching questions from broken hearted patients, as well as for researchers on neurodevelopmental disabilities. In attempt to answer this question, neuropsychologists have uncovered in human brain propensities the tendencies that may be responsible for some bizarre and “out-of-the-blues” delinquent behaviors that may develop in children regardless conscious parental precautions and dedications toward their children. With the discovery of brain-behavior relationship, many brain-behaviour theorists have discovered some of the mysteries of early childhood-related behavioral problems. Where these problems are diagnose and treated early, many of our children will be rescued and given meaningful lives, especially those with neurodevelopment disabilities. This article attempts to investigate whether there are adequate and effective neuropsychological tests that would uncover neurodevelopmental problems early before they become explosive or damaging to children, family, and to the entire society. This effort will provide a review of neuropsychological testing that are often used with children and adolescence, while highlighting how they can be beneficiary to parents, teachers, and to the public.

Keyword: Neuropsychology, cognitive neuropsychology, neurodevelopmental disability, neuropsychological tests,

Introduction

Neuropsychology or cognitive neuropsychology developed from cognitive psychology, which seeks to understand the dualistic components of mind and behavior. In
other word, it seeks to investigate the mechanism behind thought processes, acquisition and retention of information (knowledge), memory, and behaviors within a group (Rolls, 1999). The strongest tenet of the mind-body theory is the functional connectedness of what we thought (cognitive) and behavioral (functional) processes. Following the concept of the mind-body theory, neuropsychologists sustain propositions that support functional and corporate relationships between the human brain and behavior pattern (Kolb & Whishaw, 1995). This concept also has found its way into pediatric neuropsychology, which seeks to understand causal factors behind the early development of antisocial and delinquent behaviors in children (Nigg, 1999). A link between IQ, memory, and cognitive function and delinquent behaviors has been hypothesized for decades and has received steadily and quality researches in neuroscientific researches (Nigg, 1999; Kandel et al., 1988; Wolf, Beauermeister, Cohen, and Ferber, 1982).

Another well research area is the relationships between the executive function of the brain and human behaviors (Pennington, 1988), which distinguishes between cognitive functions from executive functions (Barkley, 1997). The general finding of child neuropsychologists is that some later behavior problems of children and adolescents may start with unidentified cognitive problems, which later affects other parts of the child’s whole life (Sequin, Phil, Harden, and Tremblay, 1995). The traumatic side of brain-related developmental problems is that they are so hidden and removed that before they are known irreparable harm has been done to the children mental and social function. But thanks goodness that modern science is trying to break the hideous and unsightly effects of many brain problems so that the can be dictated and treated early in the child’s life. In many cases, most serious delinquent behaviors have their early signs in memory and cognitive impairment which can be exhibited in the form of learning disability, disinterestedness in social issues, much preoccupation in external or internal activities, and externalizing behavior problems in children (McGee, Williams, Moffitt, and Andersson, 1989). Even Mentally retarded and physically handicapped children, if determined very early in life can be beneficiary to both the child and caregivers. This is why the early psychological assessment of infants, children, and adolescents are wise and reasonable step that should be taken be every conscientious patient.

This article will provide a review of neuropsychological testing that are often used with children and adolescence, while highlighting how they can be beneficiary to parents, teachers, clinicians (Nigg, 1999). The focus will be on how the tests of intelligence, academic achievement, personality, and neuropsychological functioning will help general public dictate the early signs of behavior problem caused by brain damage. For lack of space and the scope of this article, a comprehensive review of all psychological tests or even an in depth review of any individual tests will be precluded. However, curious readers are expected to consult, several books that provide comprehensive reviews of neuropsychological literatures that deal with assessment
instruments and their relationships to human behaviors (Anastasi and Urbina, 1997; Kamphas and Frick, 1996).

Furthermore, it may not be possible to cover all behavior rating scales and personality inventories in this article because the data they generate are not qualitatively different from data derived from objective psychological testing. Unlike rating scales which provide direct (although subjective) information about how individuals function within his/her environment, psychological testing does not measure functioning in the natural environment and, only rarely provide direct evidence about the presence or absence of psychiatric symptoms. Rather, psychological testing provides objective measures of behavior and/or functions derived in a laboratory-like setting.

Psychological testing, as well as neuropsychological testing are particularly good for assessing current cognitive or emotional status, what someone has learned, and/or a person’s thinking process. Test data are best understood in the context of a comprehensive clinical evaluation and cannot, in isolation with guidelines and criteria, provide DSM-IV Axis I diagnosis (Faraone, 1998). It does not mean, however, that psycho-neurological testing cannot essentially be used to determine diagnosis or to clarify etiological factors. Rather, such determinations generally require clinical inferences that go beyond the test data (Faraone, 1998). Psychological testing is more often useful for assessing aspects of a child’s cognitive and emotional status that may have important implications for treatment planning (Pine, 1993; Stokman, CJ, Shafer, D., Ng, S., O’Connor, P., Wolff, R. (1986). Assessment of neurological soft sign in adolescents: reliability studies. Developmental Medical Child Neurology, 28, p.428), rather than for differential diagnosis per se.

Understanding Test Scores

Before discussing specific psychological tests, we will present a brief review of how to interpret test score. Psychological testing reports rarely refers to raw scores, which indicate the number of items correct (or number of errors) Rather, they provide scores that indicate how performance relates to that of similar others on the same measures. For example, knowing that a 10-year-old child correctly answer 41 of 50 questions on a test means little unless you know how 10-olds in general perform in the same measure.

There are three common methods for reporting performance on psychological test: developmental score, percentiles, and standard score. In somewhat different ways, each of these reflects performance relative to that of others. The most common developmental scores are mental age and grade equivalents; although many tests provide age equivalent scores. The primary strength of developmental scores is their descriptive
appeal. Hearing that Johnny has a mental age of 7 years, or a third grade reading level, provide what seems to be a vivid picture of where Johnny stand within these domain. Yet one must be cautious when interpreting developmental scores, which unlike chronological age, are not in ratio or even an interval scale of measurement. The unit of measure on developmental scale systematically shrinks with age. A 5-years-old child functioning at the 3-year-old level might be quite impaired, whereas a 12-year-old functioning at the 10-year-oldlevel might be only moderately behind. The different in functioning between 19-and –1-year old might be meaningless. Thus, at different age, discrepancies in developmental scores mean different things. Furthermore, developmental score provide litter information about the variability of test performance, which often varies across ages. Thus within a given measure, how much do normal 10-year-olds vary around a 19-year age score? Percentile scores provide an index of where one stands relative to others on a scale of 1-100. Importantly, a score at the first or 100th percentile does not mean that person got all of the questions of the test right or wrong, it means that the individual performed worse or better than everybody else in the comparison scores have the advantage over developmental scores of maintaining their meaning at different ages. Nonetheless, like developmental scores, percentiles are on the ordinal scale. The unit of measure varies across the range. The is relatively little difference between scores at the 40th and 60th percentiles (these are equivalent to IQ scores of approximately 96 and 104, respectively), a 20-point difference near either tail of the distribution will be substantial (e.g., the 1st and 21st percentiles equal IQ scores of about 65 and 88, respectively).

In contrast, not only do standard score scales have advantage of being indicative of performance relative to others, but the unit of measures remains constant across the range of scores. Standard score scale reports scores in standard deviation (SD) unit from the normative sample’s mean. Some test report Z scores, which directly indicate SD units. Thus, a z score of 0 means that the child scored exactly at the mean of the normative sample, score of +1.0 means the child score 1 SD above the mean, and a score of –0.2 means that the child scored 0.2 SD below the mean as assessed via the normative sample. Most tests, however, do not present scores as z score. Rather a wide array of standard score scales are used which can all be interpreted in the same manner. Whereas a z score reflects performance on a scale with a means of 0 and SD of 1, an IQ score is more likely to be on a scale with a mean of 100 and SD of 15 or 16. To follow the example above, someone who scored exactly at the mean of the normative sample would receive an IQ score of 100. Someone scoring 1 SD above the mean would receive an IQ score of 115 (or 116), and someone scoring 0.2 SD below the mean would receive an IQ score of 97 (i.e., 0.2x 15=3). Thus, to interpret standard score, one must know the means and SD of the scale on which it is based.
Types of Assessment Instruments

Intelligence tests usually provide an estimate of global cognitive functioning as well as information about functioning within more specific domains. Compared to measures of virtually all other human traits, intelligence test scores are quite stable. However, degrees of stability increases with age such that early childhood and preschool measures of intelligence function are far less predictive of later functioning than assessments taken during middle childhood. Furthermore, despite their relative stability, intelligence test score may change as a function of important environmental factors. Therefore, intelligence score is descriptive of a child’s function at a point in time. This could change as a result of alteration in the child’s psychiatric status, environmental condition, and educational program or incentives.

The Weschsler’s Assessment Instruments

The Weschsler intelligence scales are the most popular among intelligence tests (Watkins, et al., 1996; Chattin & Bracken, 1989; Wilson and Reschly, 1996), and therefore, they will be described in greater detail than others. They were originally adapted directly from the Weschsler-Bellevue Intelligence Scale (Seashore, Wesman, & Doppelt, 1950). There are three different of Weschsler intelligence tests that are structurally similar but differ with regard to the target age-range. The Weschsler Preschool and primary scale of Intelligence-Revised (WPPSI-) (Weschsler, 1989), The most recent version of the test normed from ages 3 to 7.3 years; the Weschsler intelligence scale for children-Third Edition (WISC-III) (Weschsler, 1991) is normed for ages 6 to 16 years, 11 month; and the Weschsler Adult Intelligence Scale-Third Edition (WAIS-III) (Weschsler, 1997) is normed for ages 16 to 74. Years. All three are well-normed tests with considerable data supporting their reliability and validity. The Weschsler tests generate three major IQ scores: Verbal IQ (VIQ), Performance IQ (PIQ), and Full Scale IQ (FSIQ). These are all deviation IQ scores standardized by with a mean of 100 and SD of 15. Classification ranges are provide in the manuals such that the average range is considered to be between 90 and 109. High average is considered to be is 110 to 119 superior is between 120 to 129; very superior is 130 and greater. Going downward, low average is between 90 and 89 borderline is 70 to 79 and the intellectually deficient range is below 70. These tests are not particularly sensitive to individual differences below the mildly deficient range (i.e., 2 to 3 SD below the mean). Furthermore, as discussion below, Mental retardation should not be diagnosed only on the basis of data from an intelligence test. The individual must also be assessed by a measure of adaptive function.

The Verbal and Performance scales of all three Weschsler intelligence tests are composed of subtests which are scaled with a mean of 10 and SD of #, and they generate
scores ranging from 1 to 19 (i.e. +3 SD from the mean). All verbal subtests are administered orally by the examiner and require a verbal response from the examinee. They require no reading or writing by the examinee, do not involve manipulation of objection, and other than the Arithmetic subject, all Verbal subtests are untimed. The verbal subtests vary considerably with regard to the context of the material ascertained as well as relative degree of receptive and expressive linguistic demands. For example, questions on the information and Arithmetic subtests can generally be answered accurately with a one- or word response, whereas the Vocabulary, Similarities, and Comprehensive subtests frequently require lengthy explanations. With regard to receptive skill, several questions on the Arithmetic and Comprehensive subtests are semantically and syntactically complex, whereas those of the Vocabulary and the Similarity subtests involve a single word or two words, respectively.

The performance subtests primarily involve visual perceptual organization, motor speed and coordination, and visual motor integration, along with reasoning abilities. All Performance subtests are timed. Importantly, Performance tasks are not affected by poor verbal abilities. Instruction are verbally administer, and many of the tasks can be best performed using verbal mediation.

When interpreting Weschsler scores one typically looks initially for the FSIQ score, followed by VIQ-PIQ discrepancies, and finally patterns of subtests scatter (Walsh & Betz, 1995). FSIQ may be the single indicator of overall functioning, but it is true when there is not a significant differences between VIQ and PIQ scores. In the context of large difference between VIQ and PIQ, the FSIQ may of little utility. In general large discrepancies between VIQ and PIQ are indicative and suggestive of uneven development across domain of function. Although, there is some variability across ages, for the WISC-III, differences of approximately 11 points are statistically significant at the .05 level. Yet large differences are not necessarily suggestive of pathological or dysfunctionality. More than a half of the children in standardization sample for the WISC-III, comprising of 2,200 children aged 6-16, had VIQ-PIQ discrepancies greater than 9 points, and about 25% had discrepancies of 15 points or greater (Weschsler, 1991 & Walsh & Betz, 1995). Nevertheless, great differences may be indicative of language (where VIQ is very low) or perceptual motor (where the PIO is very low) problems.

In addition to a verbal IQ (VIQ), a Performance IQ (PIQ), and Full Scale IQ (FSIQ), further subtests analysis can be obtained. The subtests can be best accounted for by a four-factor scores comprising of, Verbal Comprehension, Perceptual Organization, Freedom From Distractibility, and Processing Speed (Weschsler, 1991). Generally speaking, these factors are not strictly used for diagnostic purposes, but poor performance in either of the tests may indicate difficulties in that area. For example, poor score in the Verbal Comprehension factor may be indicative of intrinsic or potential language
problem. Furthermore, children with attention-deficit/hyperactivity disorder and/or learning disabilities perform poorly on the Freedom From Distractibility and Processing Speed factors (Weschsler, 1991; Halperin, 1998). These analytic factors are not absolute in that poor performance of a child in these factors may not mean dysfunctionality because poor performance in Weschsler subtests caused by variety of reasons (Chattin & Bracken, 1989). The reliability (average across ages) for WISC-III subtests varies from a low of 0.69 for Objects Assembly, to a high of 0.87 for Vocabulary and Block Designed subtests. In contrast, the reliability values of VIQ, PIQ, and FSIQ scores are 0.95, 0.91, and 0.96 respectively (Walsh & Binet, 1995; Halperin, 1989, Weschsler, 1981; Mattarazzo, 1985). Therefore interpretations based on subtests should be with caution and only in the context of other supporting clinical and psychometric data or assessments.

Stanford-Binet Intelligence Scale (SB_IV).

It is noteworthy to mention out rightly that the WISC-III and SB-IV some major similarity, as well as some distinctive components. Like the WISC-III, the Stanford-Binet intelligence Scale are by far best-known and most widely used intelligence tests in the world (Walsh and Betz, 1995). Although both WISC-III and SB-IV are highly reliable instruments for measuring a general component of intelligence, there may be some situation where one will be more valued than the other (Walsh & Batz, 1995). The SB-IV represents several advances over the previous editions (Chattin, & Bracken, 1987; Halperin, 1989; Thomdike et al., 1986). First, the Stanford-Binet was designed for primarily for use with children and young adults, and early versions did not have enough high-rating items for use with superior adolescents and young adults. As a matter of facts, the SB-scale is well structured for retarded adults because the WISC-III, on the other hand, has too little easy-to-do items for individuals in this category. Invariably, like the WISC, the SB-IV is an individually administered test that required extensive training to administer. It is normed for infancy through adulthood, thus allowing assessment of younger children than does of Weschsler Preschool and Primary scale of Intelligence-Reversed (WPPSI).

The SB-IV is composed of 15 tests, which are divided into four cognitive areas: Verbal Reasoning, Abstract/Visual Reasoning, Qualitative Reasoning, and Short-term Memory. The SB-IV is composed of 15 tests. However, one does not need to administer all 15 tests in order to determine a reliable result. The SB-IV no longer uses the term IQ, instead it uses Standard Age Scores with a mean of 100 and SD of 16 for each of the four cognitive areas and composite score. The Standard Age of the individual has a mean of 50 and SD of 8. In the United States, the normative data for the SB-IV is nationwide to determine the reliability coefficient of excellent performance or “the Gifted Kids”.
Kaufman Assessment Battery for Children

Like the WISC and SB-IV tests, the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983), is an individually administered intelligence test. It is structured to accomplish the same general purposes as the Stanford-Binet test. However, the K-ABC was designed from a theoretical orientation, which posits a distinction between information that was processed through simultaneous versus sequential processing (Kaufman and Kaufman, 1983; Walsh & Betz, 1995; Halperin, 1989). Simultaneous processing is used on information that is presented in its entirety or as a whole. Sequential processing is used on temporal or successively presented information. In general, the Simultaneous subtests are visually presented perceptual tasks, whereas the Sequential tasks are more likely to involve verbal processing, memory, and/or sequential movements. The K-ABC yields four scores based on 16 subtests for use with children ages 21/2 to 121/2.

Infant Assessment

Several of the tests described above are appropriate for assessing preschool children, but none are adequate for testing infants. The second edition of Bayley Scales of Infant Development (Bayley-II (Bayley, 1996), which is the most commonly used test for assessing infants (Wilson and Reschly, 1996), consisted of three subsection, namely; Mental Scale, Motor Scale, and Behavior Rating Scale. The Mental Scale assesses responsivity to environmental stimulation, as well as an array of sensory/perceptual, memory, learning, and early language/communication abilities. Motor Scale assesses both gross and fine motor skills. The behavior Rating Scale is not an objective psychological test, but rather a rating of behavior processes based on the information gathered from the parents of the children or the personal observation of the clinician. The Bayley-II has reliability based on 1,700 children, divided into 17 different groups, with gender representation of 50/50 (girls 50 and boys 50). The procedure lasted between 1 and 42 months. The Mental and Motor Scales yield separate standardization scores with the mean of 100 and SD of 15. The Behavior Rating Scale yields a percentile score, supposedly interpreted under three categories: Non-Optimal, Questionable, or Within Normal Limits.

The stability of cognitive function increases with age. As such, the predictive ability of the Bayley-II is limited. This instruction should be used to assess current development level, not to predict future potential. Thus, for children within the normal range this test provides only a limited utility. However, due to the ever increasing high-risk children with pre-and or postnatal complication as a result of substance abuse, misused of prescription drugs, and prematurity, this test can be of great value for assessing current function of a child or to determine early intervention strategies.
Assessment of Mental Retardation

One may wonder what a permanently retarded child will benefit from test batteries. Gone are the days when the society thinks that all is ended with retarded children that they are good for nothing, than to be dumped and be allowed to die. The age of science and technology has made new conceptual and political changes on the way we see the retarded individuals, and in the way the retarded persons see themselves (Halperin, 1989). Of particular relevance to this view is the position that intelligence tests alone should not be used to determine the whole personality of a retarded child. It is necessary and essential that a measure of functional ability is used along side with the intelligence test. In most intelligence tests, the score of 2 SD below the mean shows that the individual is retarded. We must understand also that, notwithstanding the low intelligence scores, many retarded persons can be helped to develop effective functional lifestyle.

Furthermore, most intelligence tests have difficulties with floor effects. As such, they lack sensitivity to varying degrees to varying degree of mental retardation. To help assess the retarded children effectively, two instruments can be used: The Vineland Adaptive Behavior Scales (Halperin, 1989; Sparrow, et al., 1984; Lambert, et al., 1993), and the American Association of Mental Retardation Adaptive Behavior Scale-II (Halperin, 1989; Sparrow, et al., 1984; Lambert, et al., 1993). These scales assess the functional capacities in a wide array of domain including daily living skill, communication skills, and socialization. Most of these tests, especially, The Vineland Adaptive Behavior Scale, come in many versions, but most of them are administered as semi-structured interviews to parents, teachers, and caregivers. These tests have been accredited for their high reliability and validity. Even though the tests can be used as standard intelligence test for all, but they are more useful for setting up treatment modalities and plans for mentally deficient people.

Assessment of the Physically Handicapped

The physically handicapped persons face the same ordeal with the mentally retarded. There is erroneous feeling that the handicaps are “useless” and therefore cannot help themselves or survive by themselves. Such conception is as good as saying that a newly born baby is useless because he/she cannot function without the help of others. The increasing social awareness of the needs of the handicapped persons has facilitated advances in psychological testing for handicapped individuals. With this advancement and awareness, many handicapped persons have achieved greater self-confidence, self-esteem, and the power to live comfortably and survive the incredible pressures in the society. Most of the physically handicapped individuals are easy to test, while others are
very difficult because of part of the body affected. The assessment of hearing-impaired children, for example, is complicated. This is not only by the sensory loss associated with the impairment, which can be dealt with by administering orally presented verbal items in written format, but also by the language deficits that often accompany early hearing loss.

One of the ways to overcome such obstacle is the use of performance-type subtests found in various intelligence tests. Except for the research conducted on the validity and reliability of performance-type method, its popularity is not widely recognized. More popular method of testing the handicapped persons is the Hiskey Nebraska Test of Learning Aptitude (Hiskey, 1966). This test was developed and standardized on sample of hearing-impaired children and children with adequate hearing, and it is normed for ages 3 and 17 years. The test, which is unlimited, assesses a wide range of cognitive functions. Instructions are presented primarily through the use of pantomime and practice exercise structured.

And practice exercises. Assessment of visually impaired individuals is commonly done through the use of verbal-and elimination of performance tests from standard intelligence tests. For example, the Wechsler scales have been modified for blind examinees through the elimination of the Performance scale and few Verbal scale items that requires sight. Several adaptation of Stanford-Binet have also developme and normed for the visually impaired persons. The most recent of these is the Perkins-Binet Test of intelligence for the Blind (Davis, 1980).

Cross-Cultural Testing

The cross-cultural Testing scale was developed to answer the problem of discrepancies based on cultural difference of the persons involved in testing. It is very certain that many countries of the world are multi-cultural and therefore may not record valid result if cultural differences are not taken into consideration. For this reason, the use of psychological testing with children from diverse culture has increased in recent years. Although no test is free of all cultural influences, but attempts have been made to make culture-fair tests. These tests limit or avoid completely the use of language, timing, reading, and stimuli that may have greater familiarity in one culture relative to another. As described above the K-ABC uses less language than the WISC-III and may have have greater validity with children of non-English-speaking background. However, it still uses speed and several stimuli characteristic of American/Western cultures. In contrast, the Leiter International Performance Scale-Revised (Roid and Miller, 1997) is an untimed, which is normed for ages 2 to 20 years, and administered using essentially no verbal instructions. Each set of items beings with a simple example which is through pantomime. This revised version covers four domains of functioning: Reasoning,
Visualization, Attention, and Memory. Unlike its predecessor, the revised Leiter generates standard scores rather than the cruder ration IQ scores.

Another test is relatively free of cultural bias is Progressive Matrices (Court and Ravens, 1995). This test comes in three forms, two of which are appropriate for use with children: the colored Progressive Matrices (normed for ages 1/2 to 11 1/2 years) and the Standard Progressive Matrices (normed for age 6 to 60 years). Ravens Matrices are administered in multiple-choice format. The test starts with simple visual discrimination and gradually moves to more difficult perceptual analogies and reasoning problems. The Ravens Matrices are untimed and can be administered using virtually no language.

Academic Assessment Tests

Academic assessment test is one of the oldest tests available for assessing school performance. Today, this test has included other factors, which were left uncounted. Previously school tests and examination were conducted to the purpose of promoting a student from one grade/stage to the other. Recent development in school psychology has revolutionized the concept and use of academic test to include assignment for grade, identification of special need for remediation, and assessment of progress made by each pupil or the whole class. In all schools, high quality group-administered general achievement batteries are typically administered, and different types of these tests are available today. They include the California Achievement Tests, and Comprehensive Tests of Basic Skills, the IOWA Tests of Basic Skills, the Metropolitan Achievement Tests. These tests have excellent norms and psychometric properties and are often quite useful for identifying children with educational deficits.

However, individually administered tests of academic achievement are generally warranted for children with cognitive, emotional, and/or learning problems because these characteristics frequently have a negative impact on the child’s performance within the group format. Furthermore, the individualized assessment, which is carefully structured and observed by the clinician, is likely to provide a more detailed assessment of the nature of the child’s difficulties along with a profile of strengths and weaknesses. Finally, individualized tests are particularly useful for determining the presence of learning disabilities and to identify and highlight specific achievement-related deficiencies that may be targeted for treatment. There are many well-normed and highly reliable individualized tests of academic achievement available in schools and psychological clinics. For all these test, three most popular ones will be identified here: the Wide Range Achievement Test 3 (WRAT3) (Watkins et al., 1996; Wilson & Reschly, 1996; Wilkenson, 1993), the Weschsler Individual Achievement Tests (WIAT) (Psychological Corporation, 1992), and the Woodcock-Johnson Psychoeducational Battery-Revised (Woodcock and Johnson, 1989).
The WRAT3 contains separate tests of reading/decoding, spelling to dictation, arithmetic. The test is normed for ages 5 through 75 years and ranges in difficulty level from preschool skills (e.g., recognizing/naming letters, counting) though problems that are beyond high school level. Unlike most other tests, the WRAT3 contains matched forms of each test, making it useful for retesting after remedial intervention. Whereas the WRAT3 is generally adequate for assessing a child’s level of function in the basic skills of decoding words, spelling, and arithmetic, and thus for assessing the presence of a learning disabilities, its narrow range of focus is limiting with regard to elucidating more subtle aspects of learning difficulties such as reading comprehension, language difficulties, and writing problems.

The WIAT, on the other hand, is individually administered battery that was developed and normed (for ages 3 to 19) along with the WISC-III. This facilitates the ability to draw comparison between a child’s intellectual and academic achievement, which is an important component in diagnosing most specific developmental disorders as defined by DSM-IV. The WIAT has two recommended formats for administration. The WIAT Screener consists of three tests: Basic reading Spelling, and Mathematics Reasoning. The Screener, which can usually administered within 20 minutes, provides limited information similar to the generated by the WRAT3. However, for a more comprehensive assessment of academic achievement, the full WIAT contains additional tests of Reading Comprehension, Numerical Operation, Listening Comprehension, Oral Expression, and Written Expression. These latter tests are only necessary when there is every reason to believe that the child has learning disability, because they provide pictures of the child’s abilities in wider range of academic and social domains.

Added to the academic achievement tests is the Woodcock-Johnson Psychoeducational Battery. This test battery is designed for ages 2 to 95, and it has 21 tests of Cognitive Ability and 18 Achievement Tests. The Cognitive aspect of the test battery include long and short term memory assessment, auditory and visual processing, processing speed, comprehension, and reasoning. Within the achievement domains, the test assess not only level of functioning, but also the underlying processes, such as word attack skills, reading comprehension, letter-word identification, and vocabulary. Similar subcomponents are assessed for writing and math skill. As such, this test battery is particularly useful for evaluating the underlying component skills that go into academic competency. Therefore, it can provide information necessary for developing remedial plans.

Neuropsychological Testing

The neuropsychological assessment testing covers a wide array of cognitive functions of the individual and interpret the data in the context of a comprehensive
understanding of brain-behavior relationships. The test is useful in discriminating between psychiatric and neurological symptoms (Lezak, 1995). In many instants, neurological problems may be the underlying factor in the child’s poor social and academic developments. The need for neuropsychological test, therefore, has become central in child’s psychological test batteries. For this reason, neuropsychological testing has made a rapid expansive in popularity since approximately 25 years ago it was founded (Halperin, 1989; Lezak, 1995). The primary goal of neuropsychological testing “is to determine whether the patient had brain damage (e.g. is it organic?), and if so, which part of the brain was damaged (Halperin, 1989, p.5).” Although the neuropsychological testing is more popular with adults (especially, the accident victims and the elderly with memory diseases), its clinical use for children has been popularized with the statistic representation that about 0.8% of children, during infancy had one or more unidentified or recorded head injuries resulting from falls and beatings. Such injuries can constitute a big factor in a child’s mental and physical development, of which academic and function developments may be included (Halperin, 1989)

Whereas this application is still used with certain patient population (e.g., closed head injury), this is rarely the purpose of neuropsychological testing in child and adolescent psychiatric patients. More often than not, the goal of neuropsychological testing in children and adolescents is to provide a detailed assessment of individual’s cognitive functioning. Comparing performance across tests allows areas of strengths and weaknesses to be identified, and a comprehensive assessment of how the individual encodes, processes, stores, and outputs information is often provided. The data can then be examined to determine the ways in which the patient style of information processing either impairs functioning or can be modified to improve functioning. Although rarely diagnostic by themselves, neuropsychological assessment many play a particularly useful role in understanding the deficits in many child psychiatric patients and in treatment plan. Neuropsychological assessment is most useful in patients with wide array of at least partially neurologically based disorders such as learning disabilities, Tourette’s disorder, autism, pervasive developmental disorders, and attention deficit/hyperactivity disorder.

Many neuropsychologists use standardized neuropsychological test batteries such as the Halstead-Reitan (Reitan and Wolfson, 1993) or Luria-Nebraska Battery (Golden et al., 1986). These test batteries have separate versions for children and adults. A more recently develop neuropsychological test battery, developed specially for children, is the NEPSY (Korkman et al., 1997). The NEPSY, which is normed for ages 3 through 12 years, was designed to detect subtle deficits that interfere with learning in five functional domains: language and communication, sensory-motor functions, visual-spatial abilities, learning and memory, and executive functions. This latter domain includes function such as attention, planning, and problem solving.
The use of a standardized battery is likely to ensure that the assessment is comprehensive with regard to the breadth of domains assessed. In addition, normative data for the individual tests that make up the battery are usually adequate, and comprehensive manual facilitate interpretation of the tests scores, which is generally done via various pattern analyses. Yet many neuropsychologists contend that fix format of test batteries require excessive testing in some domains, which may not be necessary for some patients, while lacking more in-depth measures in other domains needed. Thus the lack of flexibility to tailor assessments to the individual patient may jeopardize validity of results. Furthermore they may not be adequate for comprehensively assessing the process by which individual take in information.

For this reason, many neuropsychological evaluations comprise of wide array of tests, which are hand picked by examiners. This approach may have some advantage for skilled neuropsychologists, with regard to selecting the most appropriate test for assessing the process of interest for an individual patient. Even at this, caution must be taken in the choice of each neuropsychologists because many minor neuropsychological tests do not have adequate norms, and the reliability and validity may not have been adequately tested. Whatever may be the case (whether using the standardized version or self-organized set of tests) the neuropsychological tests assess sensory, perceptual, linguistic, motor, cognitive, and executive functions.

Personality Assessment

Personality Assessment in children and adolescents involve several approaches including behavior rating scales, self-report inventories, and projective techniques. Projective testing is based on the notion that, when presented with a vague, unstructured, or ambiguous stimulus or task, the production of the individual will reflect the aspect of the personality that might be otherwise unavailable to consciousness or for assessment. In most cases the examinee is unaware of what the examiner is looking for and thus the interpretation of the test is disguised and less susceptible to faking. Yet this lack of structure, which results in a nearly infinite number of potential responses, creates psychometric problems for most projective tests. In general, normative data are sparse and interscorer reliability is problematic. Notwithstanding, there are always extremely popular tools for assessing children. The most commonly used projective instruments (Watkins et al., 1996; Wilson and Reschly, 1996) fall under one of the three categories: drawings, inkblot techniques, and verbal/storytelling techniques.
Drawings

According to a survey by Wilson Reschly (1996), the three most commonly used projective techniques are the Human Figure Drawing Test, the House-Tree-Person Test, and the Kinetic Family Drawing. The Human Figure Drawing Test (Koppitz, 1984), which is standardized for children aged 5 to 12 years, is scored for the presence of emotional indicators. While the frequency, or aggregate, of emotional indicators has been found to distinguish between normal and patient populations (Naglieri and Pfeiffer, 1992), individual indicators cannot be used for diagnostic purposes. Furthermore, the data should be interpreted in the context of other clinical material. The House-Tree-Person Testing required the child to produce separate drawing of a house, tree, and person. Again, data should be interpreted with caution, and should be used primarily to generate, not confirm, hypotheses about the child. The Kinetic Family Drawing (Handler and Habenicht, 1994) requires that the child draw a picture of his family doing something together and is interpreted in terms of the distances between individuals and the degree to which they are interacting.

The Inkblot Techniques

The most popular inkblot technique is the Rorschach (Watkins et al., 1996), which consists of 10 bilaterally symmetrical inkblots. The lack of adequate assessments’ reliability and validity, as well as the absence of a single clear procedure for administration and scoring, led to a decline in confidence in the Rorschach throughout the 1960s and 1970s (Exner and Weiner, 1994). However, the development of Exner (Exner and Weiner, 1994) comprehensive system for administering and scoring throughout the past two decades has begun to reverse that trend. By gleaning aspects of several previously described systems, Exner’s atheoretical Comprehensive system has begun to apply modern psychometric procedures to the Rorschach. There are now clear guidelines for administration and scoring, as well as normative data of children and adults. Furthermore several reliability and validity studies on the Rorschach tests have yielded positive results and the newly revived test data may provide useful data regarding aspects of thinking, perception, and effective responsivity in children. Although, caution must be used in interpreting their data, they must not be used in isolation for making important decisions about diagnosis, etiology, or prognosis of problems.

Storytelling Techniques

There are several types of Storytelling Techniques where the child is required to tell a story in response to a picture. There are two popular tests to be discussed here: the Thematic Apperception Test (TAT) (Watkins et al., 1996; Bellak, 1993), which is reported to be applicable to adults as well as children down to the age of 4 years, and the
Children’s Apperception Test (CAT) (Bellak, 1993), which was designed for children aged 3-10 years. Whereas the TAT consists of sets of black-and-white pictures depicting various scenes, the CAT depicts cartons-like pictures of animals in human situations that relate to various developmental themes (e.g., toilet training, feeding, and sibling rivalry). The task is for the examinee to tell story based on the picture. Despite the common use of the TAT and CAT, few clinicians use systematic procedures for administration (even varying which cards they choose to present), and true scoring of inferences about social relationships and interpersonal interactions are often made. Because of that lack of standardized procedures and objectivity in scoring, these results must be interpreted with extreme caution.

Reference


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