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ABSTRACT

Neuropsychology is an area in which the functioning or integrity of the brain is linked to measurable human behavior. This paper describes the use of the Reitan batteries (Reitan and Davison; 1974) in public school settings for documenting and prescribing appropriate academic programs. Three individual case studies are presented. Case 1 is a 16 1/2-year-old male, who was placed in a foster home after severe family upheaval. The results of the evaluation showed greater impairments in problem solving than would be expected from psychological and neuropsychological scores. A program focusing more on his emotional than academic needs was recommended. Case 2 is a 10-year-old girl with Turner's Syndrome (a chromosomal abnormality). The neuropsychological evaluation showed higher level functioning on indicators of brain integrity than would be expected from her psychometric scores. Her inclass program was shifted toward one resembling that of a learning disabilities child with a visual-spatial orientation deficiency. Case 3 is an Arabic adolescent who had spent years in trainable or educable mentally handicapped programs, based on nonverbal assessments. The neuropsychological evaluation showed severe dysfunction on all tests. This led to the premise that his previously measured strengths were not indicators of academic potential but merely unexpected skills. Neuropsychological evaluations, although a time- and material-expensive procedure, can provide another dimension for understanding human potential and planning educational programs. (LLL)

Applying Clinical Neuropsychology in the Public Schools

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Brief Background of Neuropsychology

Neuropsychology has been an area of interest to researchers as Luria, Reitan and Halstead since WW II. It is an area where the functioning or integrity of the brain is linked to measurable human behavior. There are two main batteries for assessing neuropsychological functioning. This paper will focus on the use of the Reitan batteries (Reitan and Davison, 1974) in public school settings for documenting and prescribing appropriate academic programs.

There are five main themes to keep in mind with regard to the Reitan tests. These are:

1. Research was done to prove how brain-damaged hospitalized people were different from nonneurologically hospitalized people, thus balancing for some stress factors.
2. The test was validated on a variety of brain damaged people: open, closed head injury; intrinsic, extrinsic tumors; vascular anomolies; degenerative and other diseases, etc.
3. Many items on the test allow for four areas of diagnosis:
   a) Overall level of function (0.0 to 1.0 index).
   b) Laterality (R or L hemisphere).
   c) Localization within one hemisphere.
   d) Possible causes.

   There are a number of studies showing good validity of test results to the specifics above.

4. Over time the adult test was scaled down to an older children's (9-15) form and then a younger children's (5-8) form was made with different yet equivalent process tests.*
5. Recently research has looked at differential profiles for normal, LD and brain-damaged older children.

Early Uses of Neuropsychology

Originally I examined children with a history of neurological impairment. Testing was done to document how much of their psychological impairment was accountable for by their neurological dysfunction. I hypothesized that children with abnormal EEGs; histories of brain tumors (especially intrinsic); diagnosed atrophy of the brain; encepholitis history; and other severe insults to the brain would show large areas of severe dysfunction. I also hypothesized that: problems early in life, closed head injuries; and extrinsic tumors would show mild (compared to their psychological level) dysfunction if any that may or may not be discernable scorewise from what is often seen in "MBD" labelled LD child.

After one year of using the Reitan and seeing some children, it appeared that age and severity of insult were important factors. Children with very early (even perinatal or 1st year) problems generally showed little difference between psychological and neuropsychological functioning (as measured by the Weichsler's and Reitan tests). Generalization of damage had indeed occurred and localization rarely was documentable. The children with less

*Note: The older children's test takes about 4 hours including WISL-R and younger child's test takes about 3-3-1/2 hours including WISL-R or WPPSI.

serious incidents generally did not show any more impairment in neuropsychological functioning than many low-average "normals."

Early Rethinking

What had occurred at this time in my use of the Reitan was only to be able to verify what was essentially known. This did not seem to be worth the effort. In talking with others and an earlier presentation (Federhar, 1981) at RMPA I proposed use of the Reitan as a tool to look at children showing a wide variety of educational problems (LD, EMH, and all ranges of EH) in order to discern what proportion of their educational impairment appears to be related to neuropsychological or brain impairment rather than due to traditional IQ or processing factors or environmental stress. My goal was to improve staff's understanding of how much or how little a student's impairment in neuropsychological functioning may effect both behavioral and academic progress.

Some Examples of this Rethinking and Reapplication

Case 1 - This is a 16-1/2 year old male who after severe family upheaval was placed in a foster home. He has a history with an EEG showing right temporal lobe irregularities; seizures that may be stress induced; no academic progress or credit in 1-1/2 years; behavior problems at school; and a WAIS-R (VS=100; PS=80). The results showed overall results to be on the cut-off between normal and mildly impaired. He had mild yet documentable problems on half of the laterality tests for right hemisphere problems as well as some specific deficit areas. The results of the

evaluation showed some impairment in problem solving that were greater than would be expected by the Psychological and Neuropsychological scores. Thus the recommendation was made for a program to focus more on reducing his emotional needs than his academic needs based on an MBD diagnosis (one recommendation made earlier). The staff was given guidance to focus on his probably needing more than a basic EH program. He would need extensive rehearsal and cueing to reduce his confusion of social cues that was accentuated by situational stress.

Case 2 - A 10 year old girl with Turner's Syndrome (i.e. X___). There has been a small history of research looking at this chromosomal abnormality and relating it to a learning disabilities profile based on psychometric properties (Pennington, et al, 1982). The neuropsychological evaluation showed higher level functioning on the general indicators of brain integrity than would be expected for her psychometric scores. However, there were some mild right hemisphere indicators that correlated with lower OA and BD scores on the WISL-R. This young girl was doing within the norms of her regular school classroom. However, this assessment recommended that much of her potential (especially in the language areas) was far above her previously thought potential. Her inclass program was shifted more toward one resembling a learning disabilities child with a visual-spatial orientation deficity. Follow-up teacher and standard test scores showed strong improvements to above average performance in linguistic or language arts areas (about 1-5 years in 6 months).

Case 3 - An Arabic adolescent who had spent a number of years in either TMH or EMH programs based on nonverbal assessments (as the Leiter and CMMS). He was referred for a neuropsychological after his most recent updated standard evaluation. When he finished the last item offered by the examiner he asked her what was in the briefcase next to her. She opened the WAIS and he asked to work with the materials. She found he had scaled scores of BD = 8, OA = 10, and a PIQ of 85. The neuropsychological showed severe dysfunction on all tests of neuropsychological functioning. This led to the premise that his 2 strengths were not indicators of academic potential but merely 2 unexpected skills he had. Obviously his program worked to apply these isolated strengths, even though the student may not have known how he was doing what he was.

Discussion

Thus neuropsychological evaluations can provide another dimension toward understanding human potential and planning educational programs. Granted, this is a time and material expensive procedure - it cannot be used with all children. I am continuing to gather follow-up data with respect to long range goal acquisition in response to neuropsychological recommendations and hope to look at it in detail as the number of cases and data increase. Neuropsychological information does appear to have more use than purely confirmation of already diagnosed medical deficits.

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