

***Functional Assessment  
of Individuals with  
Cognitive Disabilities:  
A Desk Reference  
for Rehabilitation***

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# ***SECTION 1: Introduction and Overview***

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## **Introduction to This Handbook**

This handbook was created as a reference for vocational rehabilitation (VR) counselors, psychologists providing services to state VR agencies, vocational evaluators, individuals with disabilities, and other professionals working with persons with cognitive disabilities. The handbook was supported, in part, through two U.S. Department of Education, Rehabilitation Service Administration grants, "Rehabilitation Psychology Training Program for Psychologists and Rehabilitation Professionals: Assuring Functionally Useful Assessments, (H129J10012) and Functional Assessment of Individuals with Severe Cognitive Disabilities: A National Short Term Training Project, (H246D30003)."

The handbook is designed to provide background and reference materials in the area of functional assessment of cognitive disabilities. The first section provides an overview, for non-VR professionals and consumers, of the vocational rehabilitation system and the legislation that governs this system. General information regarding cognitive disability types and manifestations is presented and functional assessment is defined and illustrated.

In the second section of the handbook, a framework for understanding the functional impact of cognitive disabilities is presented. As a result of providing functional assessment services for individuals with cognitive disabilities, and conducting multiple training programs in the content area, it became very clear that knowledge of assessment procedures was not sufficient to enable professionals to conduct functional assessments and fully understand the impact of cognitive disabilities on work and daily living. Practitioners need to have a working knowledge of cognitive domains influenced by disabilities such as learning disability and acquired brain injury. Developing an intuitive feel for the effect of cognitive disability is a prerequisite to effectively using functional assessment for this population. This section presents the cognitive domains that should be considered, an overview of the potential impact of impairments in each of the domains, and a framework for functionally evaluating vocational and everyday performance in each of seven cognitive domains.

The next section of the handbook deals with the procedures utilized in functional assessment. These include use of existing information, functional interviewing, incidental observation of cognitive behaviors in informal contacts with the individual, psychological and neuropsychological testing, vocational assessment, and simulations and observations in the natural environment. Also discussed in this section are developing appropriate referrals, pre- and post-assessment dialogue, and reporting and communicating the results of the functional assessment.

A critical component of the functional assessment process is relating the individuals' abilities and impairments to the demands of the chosen goal and the environment in which he or she will be required to perform. In order to accomplish this, the cognitive demands of the goal and environment must be identified. The next section deals with how to systematically assess cognitive demands in the natural environment.

Section five provides suggestions for maximizing the utility of the assessment process in

vocational rehabilitation, including shaping the diagnostic and testing process to be more useful, improving the counselor's functional assessment skills, and cultivating providers of more functionally relevant assessments for individuals with cognitive disabilities. A glossary of common terms, a case example and sample functional assessment report, a list of references, and a description of tests and test score interpretation guide are among the appendices.

While this handbook describes an intensive functional assessment process which can be completed as a whole, it is important to remember that various aspects of the process can be readily incorporated into the routine of all counselors, psychologists, therapists, and educators. Looking at obstacles to vocational or educational goals in the contexts of cognitive domains will enhance rehabilitation and educational planning, and allow for personal growth and greater success on the part of the individual.

# Assessment in the Context of the State-Federal Vocational Rehabilitation Process

Since 1920, the federal and state governments have assisted individuals with disabilities to achieve employment through the state-federal vocational rehabilitation program. This program operates as a federal-state partnership with the federal role being that of leadership and provision of resources while the states' role has been that of administering the program.

The Rehabilitation Services Administration (RSA), within the Office of Special Education and Rehabilitation Services, U.S. Department of Education, oversees the program at the federal level. Through each of ten regional offices, RSA provides guidance, technical assistance, and leadership to the states. RSA is responsible for approving state plans which identify and detail proposed operations, service priorities, and budgets. The state agency administers the program through local offices throughout the state. The state agency and local offices are responsible for providing and arranging services and assistance to individuals with disabilities.

The goal of the state-federal vocational rehabilitation program is to assist individuals with disabilities to achieve employment outcomes. The program provides services to eligible individuals with disabilities, consistent with their strengths, resources, priorities, concerns, abilities and capabilities, so that these individuals may prepare for or engage in gainful employment. The purpose and policies of the vocational rehabilitation program is consistent with the principles of the Americans with Disabilities Act (ADA) of 1990. The VR program is carried out based upon the following principles:

- Individuals with disabilities, including individuals with the most severe disabilities, are generally presumed to be capable of engaging in gainful employment;
- Individuals with disabilities must be provided opportunities to obtain employment in integrated settings;
- Individuals must be active participants in their own rehabilitation programs, including making meaningful and informed choices about the selection of their vocational goals, objectives and services;
- Families and natural supports can play an important role in the success of an individual's vocational rehabilitation program;
- Qualified rehabilitation personnel can facilitate the employment goals of the individual with a disability; and
- Individuals with disabilities and their advocates are to be full partners in the rehabilitation program and be involved in a meaningful manner in policy development and implementation.

Once determined eligible, a VR counselor who is assigned to the individual gathers as much information as possible about the individual's work history, education and training, abilities and interests, rehabilitation needs and possible career goals. Together, the counselor and the individual develop an individualized written rehabilitation program (IWRP) that identifies the individual's long-term vocational goals, along with the steps necessary to achieve the individual's goals, the services required to help the individual reach those goals, and the evaluation criteria used to determine whether goals have been achieved. The IWRP also contains a description of how the individual was involved in choosing among alternative goals, objectives, services, and service providers.

## **Vocational Rehabilitation Legislation**

The State/Federal vocational rehabilitation system is based in a number of legislative acts dating back to the passage of Public Law 236 - the Smith-Fess Act in 1920. This act essentially extended existing vocational education legislation for the rehabilitation of soldiers returning from war to civilians with disabilities. The act provided funds for the rehabilitation of physically disabled persons who were either totally or partially incapacitated for remunerative occupation (Rubin & Roessler, 1987). In 1943, the Bardon-Lafollette Act was passed which extended the federal-state vocational rehabilitation program services to individuals with mental retardation and mental illness. In 1954, Public Law 565 increased the federal share of the federal-state match to 60% and expanded services to persons with mental retardation and mental illness through the development of research and demonstration grants, funding extension and improvement grants (for serving individuals not previously served and for developing new rehabilitation services), and through rehabilitation facility development. In 1965, Rehabilitation Act amendments expanded service eligibility to individuals with behavioral disorders diagnosed by a psychologist or psychiatrist, made individuals of socially disadvantaged groups eligible for evaluation and adjustment services, and established 6- and 18-month extended evaluation services for determining the employment potential requirement for eligibility.

The Rehabilitation Act of 1973 brought about a specific emphasis on serving individuals with severe handicaps, and greater involvement of individuals with disabilities in the vocational rehabilitation process. In this Act, the commitment was to serve individuals with *severe* physical, intellectual, and emotional disorders (which were diagnosed by qualified and knowledgeable physicians or psychologists). The Act required that individuals receiving rehabilitation services participate with the counselor in developing a service plan, the Individualized Written Rehabilitation Program (IWRP). The IWRP was to identify rehabilitation goals, services to be provided, and a mechanism for evaluating attainment of goals. In addition to individuals participating more actively in their own programs of rehabilitation, the Rehabilitation Act of 1973 called for greater involvement of consumers of rehabilitation services in state and federal policy development and planning. The 1978 amendments to the Rehabilitation Act of 1973 established independent living services to individuals through the state-federal vocational rehabilitation program.

The Rehabilitation Act Amendments of 1992 reflect the most current legislation governing the state/federal vocational rehabilitation program, and extended the Rehabilitation Act of 1973 for a five year period. The 1992 amendments specify that the Rehabilitation Act is consistent with the principles of the Americans with Disabilities Act of 1990. The purposes of the Rehabilitation Act were identified as to empower individuals with disabilities to maximize employment, economic self-sufficiency, independence, and inclusion and integration into society through: comprehensive

and coordinated state-of-the-art programs of vocational rehabilitation; independent living centers and services; research; training; demonstration projects; and the guarantee of equal opportunity. Furthermore, the Act insured that the Federal government play a leadership role in promoting the employment of individuals with disabilities, especially individuals with severe disabilities, and in assisting states and providers of services in fulfilling the aspirations of such individuals with disabilities for meaningful and gainful employment and independent living. A major theme of the amendments provided assurances of client involvement in the vocational rehabilitation process and informed choice of goals, services and service providers.

The key tenets of the 1992 amendments pertaining to the delivery of vocational rehabilitation services include:

- With respect to eligibility, the requirements were clarified to specify that an individual is eligible if he or she is an individual with a disability, and requires vocational rehabilitation services to prepare for, enter into, engage in or retain gainful employment. The bill provided that it shall be presumed that an individual can benefit from vocational rehabilitation services unless the designated state agency can demonstrate, by clear and convincing evidence, that such individual is incapable of benefiting in terms of an employment outcome.
- The state agency must make eligibility determinations within 60 days, unless exceptional and unforeseen circumstances exist that are beyond the control of the state agency, and the individual concurs with the extension or an extended evaluation is required.
- The individual with a disability must be involved jointly in the development of a rehabilitation plan (IWRP) which must be fully accessible in form and content to the individual, and which must contain the following: an employment objective consistent with the unique strengths, priorities, and capabilities of the individual; a statement of goals and intermediate rehabilitation objectives which are based on assessment of needs and career interests and which include placement in an integrated setting; the specific services to be provided along with the projected dates for initiation and anticipated duration of each service.
- That special effort be made to meet the vocational rehabilitation needs of individuals from traditionally under served populations, including individuals with disabilities from minority backgrounds.



## **Vocational Rehabilitation Eligibility**

To be eligible for VR services, an individual must meet three criteria:

- 1) The individual must have a physical or mental impairment that is a substantial impediment to employment;
- 2) The individual must be able to benefit in terms of employment from VR services; and
- 3) The individual must require VR services to prepare for, enter, engage in, or retain gainful employment.

The eligibility determination is made by the counselor on the basis of information obtained in the assessment process. Sources of information include school records, medical and developmental history, interviews with parents and other informants such as teachers and counselors, and formal assessment procedures such as psychological and neuropsychological testing, vocational evaluation and situational assessments. With the Rehabilitation Act Amendments of 1992, the VR program is required to use information from existing sources, particularly information used by education officials and the Social Security Administration, as well as information provided by the individual and their family member to make eligibility determinations, as well as choose goals and plan rehabilitation services. Determinations of disability may be used to meet the VR requirement that the individual meet the definition of an individual with a disability. Furthermore, under the new rehabilitation legislation, an individual with a disability that presents as a substantial impediment to employment is presumed to be able to benefit from rehabilitation services in terms of an employment outcome.

## **Assessment for Vocational Rehabilitation**

Assessment in vocational rehabilitation with individuals with cognitive disabilities can be viewed as serving two major purposes: 1) to provide information which enables one to make a diagnostic and eligibility determination; and 2) to provide information about an individual's functional abilities and challenges in order to determine the impact of the cognitive disability and develop and implement a vocational rehabilitation plan.

Because conditions underlying cognitive disability can influence a number of cognitive domains, assessment must be comprehensive enough to cover all the potential areas of deficit specified (executive abilities, attention, memory, communication, functional academics, sensory and motor skills, and psycho-social functioning), as well as provide the necessary clinical information upon which to assign a medical diagnosis. Thus, the assessment process must be able to yield a diagnosis and specify the functional impediments or impact of the disability to allow the rehabilitation counselor to make an eligibility determination.

With respect to vocational rehabilitation goals, the assessment process must also yield information on what an individual can and cannot do, that is, the individual's functional abilities and the obstacles to attaining employment outcomes. This information is necessary to jointly develop a rehabilitation plan. The information collected through the assessment process facilitates planning around such topics as identification of a meaningful, attainable vocational goal, delineation of strategies that are required and the degree to which these are required for

overcoming obstacles. Planning of accommodative, remedial or compensatory strategies derived from assessment, along with recommendations for environmental and demand modifications enable the individual to meet the requirements of training and employment.

In assessment for vocational rehabilitation, a comprehensive and multidisciplinary approach is required. Rationale for such an approach is provided by the broad range of cognitive, behavioral, and emotional characteristics identified in individuals with cognitive disability through research studies which have described this population.

Most commonly, individuals with cognitive disabilities are provided with standard psychological or psychoeducational assessment through their initial involvement with the VR system. Typically, this includes intelligence, achievement testing and some measure of personality. This approach is largely insufficient to meet the needs of the individual in vocational rehabilitation. In a vocational rehabilitation setting, reliance upon a psychological test battery might result in a failure to identify the disorder, or the potential impact of the disorder, in an individual whose deficits might not be readily gleaned from psychological tests alone. Assessment of adolescents and adults with difficulties resulting from cognitive disabilities should be accomplished through the administration of a combination of clinical and psychometric tools including the clinical interview, collection and review of existing historical data such as developmental milestones and school records, behavioral observation of the client, norm referenced tests and expanded functional assessment procedures designed to identify the impact of cognitive disabilities.

## **Services Available**

The scope of services that may be provided to eligible individuals include:

- assessment to determine eligibility and VR needs;
- vocational counseling, guidance and referral services;
- physical and mental restoration services;
- vocational and other training, including on-the-job-training;
- maintenance for additional costs incurred while the individual is in rehabilitation;
- transportation related to other VR services;
- interpreter services for individuals who are deaf;
- reader services for those who are blind;
- services to assist students with disabilities to transition from school to work;
- personal assistance services (including training in managing, supervising, and directing personal assistants) while receiving VR services;
- rehabilitation technology services and devices;
- supported employment services; and

□ job placement services.

Through the involvement of the VR system, the above services are typically available. However, differences in policy and service availability among individual states, and regions or districts within states, may result in considerable variability in the actual accessibility of services. Furthermore, the identified vocational rehabilitation needs of individuals with cognitive disabilities may extend beyond these traditional services. Individuals with cognitive disabilities require supports and pragmatic interventions to assist them to accurately appraise their abilities and challenges, and the specific obstacles they are likely to encounter in the pursuit of their vocational goals. They require assistance in vocational and career exploration activities, involving experiential and supported learning opportunities to enable individuals to make better decisions about jobs and careers. They also need practical community-based supports for developing and maintaining accommodations and environmental/demand modifications, both in the training and work environment.

# Overview of Cognitive Disabilities

Persons with severe cognitive disabilities resulting from acquired brain injuries (ABI), specific learning disabilities (SLD), other neurologically based disorders, attention deficit disorders (ADD), and severe mental illness present a difficult challenge to vocational rehabilitation. Because of the multiple disabling conditions (cognitive, physical, communication) that these persons may experience, rehabilitation success rates are low. Difficulties in the accurate appraisal of abilities and limitations, for eligibility decision making, vocational goal setting, and for rehabilitation planning, are cited as areas in which rehabilitation counselors experience significant problems. The challenges are further compounded by the lack of available resources for obtaining accurate information on the vocationally significant functional limitations and capacities of individuals with cognitive disabilities, as standard assessment procedures, including psychological and neuropsychological tests, have not been effective in identifying the functional impact of cognitive disabilities.

Persons with cognitive disabilities comprise a group of persons whose disabilities present severe cognitive, behavioral and emotional challenges. Although the etiologies differ for persons with TBI, other acquired brain injuries, SLD, ADD, and mental illness, empirical and clinical experience indicate that they share similar challenges in cognitive domains such as attention, planning, insight, initiation, memory, perception, and information processing which have a negative effect on vocational outcome. Considerable information about why persons with severe cognitive disabilities do not have successful vocational outcomes is reported in the literature. Factors most frequently cited include behavioral and social difficulties, and cognitive problems, particularly related to attention, memory and communication.

## Diagnostic and Definitional Issues

In identification of a cognitive disability for vocational rehabilitation purposes, an individual is likely to be assigned a diagnosis of either an organic mental disorder, a specific developmental disorder, or a psychiatric disorder. In addition, the individual will meet definitional criteria identified by the federal/state VR system that identifies a specific "disability" which may be served by the VR system. The assessment process is essential in both formulations.

In TBI or other acquired brain injuries, the etiological condition is often known by history. By this condition, the individual may be coded within the VR system. Assignment of diagnosis is made by identification of the specific criteria for a DSM (DSM-III-R, DSM-IV) or ICD (9th or 10th revision) categorization. Identification of early life trauma or unknown organic conditions are more complex, both with respect to diagnosis and definition. Issues of retardation vs. specific "brain damage," or "brain damage" vs. LD arise frequently.

In long-term mental illness (LTMI), a psychiatric diagnosis should be made on the basis of a detailed clinical-diagnostic interview. This diagnosis can be made by a psychologist, but such diagnoses are difficult to establish on the basis of an interview without a clear and reliable history. The administration of projective and objective psychological tests may assist in making the diagnosis, but never should a psychiatric diagnosis be made on the basis of the psychological tests alone, without factoring information from a structured diagnostic interview, behavior and background, particularly in the population of individuals who experience cognitive limitations, as these may interfere with psychological testing to the degree that results may be influenced by

cognitive/organic factors rather than emotional/psychiatric/personality factors.

Diagnosis of SLD is a more complex and controversial issue due to the extreme heterogeneity of the SLD population, the lack of a clear consensus on one definition of SLD, and difficulties which arise from the basic inconsistencies between what is an appropriate diagnosis and what are disability categorizations of learning disability. Eligibility policies have resulted in an operational definition of learning disability for the education system and for vocational rehabilitation. However, these definitions do not constitute a formal clinical or medical diagnosis. RSA's policy with respect to eligibility of persons on the basis of SLD stipulates that in order for an individual to be categorized as having a specific learning disability, they must be diagnosed by a physician or psychologist who is knowledgeable in the identification of specific learning disability, supported by data developed by members of an interdisciplinary team, including medical, psychometric and vocational evaluation personnel. While the RSA criteria do not specify the diagnostic categorization system to be employed, both the DSM (Diagnostic and Statistical Manual of the American Psychiatric Association, 1987, 1994) and ICD (International Classification of Diseases, U.S. Department of Human Services, 1980) diagnostic categorization systems are options. Neither the DSM or the ICD provide a diagnostic category or grouping that is consistent and comprehensive with respect to the definition of SLD as set forth by RSA. The most logical diagnostic options are the Specific Developmental Disorders of the DSM. In some cases, where the primary presentation of the SLD is not academic (academic discrepancy or deficit is not required to establish the presence of an SLD), options such as an atypical developmental (Developmental Disorder, Not Otherwise Specified) or Organic Mental Disorder can be considered. For example, an individual who presents with a number of perceptual, attentional, and/or memory deficits, with poor coordination and deficits in the ability to read social cues, but has developed compensatory academic skills which enable him or her to score normally on academic achievement tests meets RSA definitional criteria of SLD, but in order to assign a DSM diagnosis, one must consider diagnoses in either the atypical or organic mental disorder categories. Table 1 (page 13) provides a breakdown of DSM diagnoses which are within the scope of the RSA definition of SLD.

**Table 1**  
**DSM Diagnostic Options For Learning Disability**

**SPECIFIC DEVELOPMENTAL DISORDERS**

**Learning Disorders**

- 315.00 READING DISORDER
- 315.10 MATHEMATICS DISORDER
- 315.20 DISORDER OF WRITTEN EXPRESSION
- 315.90 LEARNING DISORDER, NOT OTHERWISE SPECIFIED

**Communication Disorders**

- 315.39 PHONOLOGICAL DISORDER
- 315.31 EXPRESSIVE LANGUAGE DISORDER
- 315.31 MIXED RECEPTIVE-EXPRESSIVE LANGUAGE DISORDER
- 307.90 COMMUNICATION DISORDER, NOT OTHERWISE SPECIFIED

**Motor Skills Disorder**

- 315.40 DEVELOPMENTAL COORDINATION DISORDER

**ATTENTION DEFICIT AND DISRUPTIVE  
BEHAVIOR DISORDERS**

- 314.01 ATTENTION-DEFICIT/HYPERACTIVITY DISORDER
- 314.90 ATTENTION-DEFICIT/HYPERACTIVITY DISORDER, NOT OTHERWISE SPECIFIED

**ORGANIC MENTAL DISORDERS**

- 294.90 COGNITIVE DISORDER, NOT OTHERWISE SPECIFIED

# The Functional Assessment Process

Attention directed to the specific limitations of persons with cognitive disabilities has focused on the difficulties these individuals have in achieving successful vocational and community integration. Both higher education and the federal-state system of vocational rehabilitation have been significantly challenged in the provision of services to these persons because of the cognitive, behavioral and psycho-social presentations of the disability. A critical component of the assessment process is establishing not just the presence of a disability, or elucidation of the deficits that might be associated with cognitive disabilities, but determining how the disability impairs or impedes vocational and independent living functions. Unlike the limitations of physical disabilities, the cognitive manifestations of disability are not easily quantified, and the impact of specific cognitive deficits is difficult to ascertain. Assessment must provide detail as to how deficits might interact with task and environmental demands to impact the individual's functioning in real life situations.

For assessment to be optimally useful, results should yield information on how the individual functions in the natural environment, when faced with work, education and training, and independent living demands. Assessment conducted in a vacuum with little relevance to real world demands is of limited use in the planning and delivery of rehabilitation services. Therefore, functional assessment becomes an integral part of service provision to persons with cognitive disabilities.

## Definition of Functional Assessment

Functional assessment may be defined as the analysis and measurement of specific behaviors that occur in real environments and are relevant to life or vocational goals (Halpern & Fuhrer, 1984). Functional assessment always involves an interaction between the purposeful or "goal directed" behavior and environmental conditions such as people, rules, physical barriers, or schedules. Because the demands placed upon a person differ from one environment to another and from one task to another, functional assessment is always a highly individualized process.

Functional assessment is undertaken to determine the impact of disability on behavior. Medical evaluations, diagnostic evaluations, and psychological testing are measures of disability. In contrast, functional assessment, which relates to purposeful behavior such as performing a specific job task, is a measure of the degree of impediment. The *environmental specificity* and *goal directedness* of functional assessment separate it from other types of assessment. Put simply, functional assessment is the measurement of what persons can or cannot do (their strengths and weaknesses) in particular situations, under certain conditions and in light of unique demands.

The objective of functional assessment is to identify the unique obstacles to goal attainment for the individual with a cognitive disability. Obstacles occur as the deficits associated with the cognitive disability (e.g., auditory inattention) interfere with the individual's ability to meet demands and conditions imposed by the environment in which the individual must function (e.g., noise and distractions), the goal the person aspires to attain (e.g., accounting clerk) or the specific task requirements of a particular situation the individual must master. The challenge of functional assessment is not only to identify the individual's strengths and weaknesses, but to understand fully the demands and conditions of the environment in which the individual expects to function. The purpose is to delineate the functional obstacles that are likely to occur so that

rehabilitation intervention might be systematically applied.

Functional assessment with an individual with cognitive disabilities should reveal information about assets and about limitations or potential problem areas. An *asset* is defined as a skill, ability, or knowledge that represents a strength area relevant to the rehabilitation goal. Assets should be objectively stated and operationally defined to the extent possible (for example, when, where, with whom, under what circumstances) and should specify the frequency, duration, and intensity in which the asset occurs. An example of an asset statement is "has excellent verbal communication skills, characterized by good vocabulary, clear expression of thoughts and ideas, good comprehension of spoken technical information, such as medical terms, and pleasant interpersonal affect in work and social situations."

In addition to specifying assets, information regarding functional limitations is obtained. A *functional limitation* is defined as any factor, condition, or situation resulting from a disability that impedes an individual's ability to function independently or attain goals (Miller & Mulkey, 1983). The clinician should always identify functional limitations in behavioral, not in diagnostic terms. For example, describing a functional limitation as "unable to pay attention to information that is presented auditorially (verbal instructions on the job) when noise from other conversations, radio, etc., occurs. This often happens in the workplace and results in reduced efficiency, effectiveness, and ability to learn," is more useful than simply using "attention deficit disorder." In this example, a specific type of inattention is specified, in a particular situation and under specific conditions. It also identifies the impact of the behavior.

Functional assessment should span the entire rehabilitation process with an individual. Initial assessment should be conducted within the clinical or rehabilitation setting, with subsequent assessments ultimately performed in the natural environment. Functional assessment data are gathered throughout the entire process, using approaches such as role plays, situational assessments, work simulations, and through direct observation in a number of real life settings.

Active involvement of the individual with a cognitive disability in the assessment process improves the validity and reliability of the information gathered and enhances the individual's understanding of and investment in rehabilitation. Personal involvement in gathering functional assessment information may also provide a therapeutic approach to gaining more accurate self-appraisal and insight into strengths and limitations because it is not a clinical process; rather, it is the observation and recording of real life behavior.



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## ***SECTION 2: Framework for Functional Assessment***

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### **Overview of a Model of Functional Assessment of Cognitive Disabilities**

The goal of functional assessment is to gather information and understand the problem solving capacities of the individual. This involves obtaining knowledge beyond an individual's success or failure at a task; the specific *reasons* for success or failure, and the *conditions* under which this occurs must be considered. Approaches to functional assessment must lend themselves to obtaining information which is relevant to what an individual can or cannot do in specific situations and in light of the individual's particular goals and objectives.

Functional assessment utilizes a number of specific tools, including obtaining direct information from the individual with a cognitive disability, and from informants such as family members and others aware of that individual's functional abilities. Information is obtained through interview, the administration of rating scales and questionnaires used to quantify the observations and reports of the individual and other informants, administration of more traditional assessment tools such as psychological and neuropsychological tests, observation of performance on simulations and situational assessments, and direct observation in the natural environment. All information gathered in this process constitute data upon which inferences are made about an individual's ability to meet the demands of the work, vocational training or higher education and daily living. The various sources of information should be integrated, with successive approaches used to refine impressions regarding functional abilities.

Rehabilitation professionals involved in providing services to individuals with cognitive disabilities must have a working knowledge of cognitive functions. Developing an intuitive feel for the effect of cognitive disability is a prerequisite to using functional assessment for this population. In the following segments, the cognitive domains that should be considered will be presented, along with an overview of the potential impact of impairments in each of the domains. We will also present a framework and guide for obtaining functional information in each of seven cognitive domains using functional assessment procedures.

# Cognitive Domains to be Considered

The following is a general discussion of seven domains affected by cognitive disability. While there are many ways to conceptualize cognitive domains, those chosen here reflect a pragmatic grouping upon which to base a functional assessment. The purpose is to provide a model upon which to structure an assessment of the impact of a cognitive disability, and to understand the vocational and everyday obstacles resulting from the disability. There may be redundancy across domains, and such a conceptualization is not meant to imply that the problems experienced by individuals can be explained exclusively by their performance in one or several of these cognitive domains. We realize that a complex relationship exists between these human abilities, and it is often very difficult to tease out to what a functional obstacle may be attributable. For example, if an individual experiences a problem in learning, is the problem due to limited intellectual capacity, failure of attention during the learning process, limitations in comprehending spoken or written information during learning, or a memory deficit in storage or retrieval of information? Within this framework, information is collected systematically along the domains through various procedures, then synthesized to determine functional obstacles and the reasons for these obstacles. With the understanding that these domains are not exclusive, and that functional problems may have more than one cause, we pose this framework for gathering and then integrating information into rehabilitation planning to overcome functional obstacles.

In the following discussion, a definition of the domain and critical areas to explore within the domain are presented. You will also find information regarding specific assessment strategies for evaluating each domain. Information is presented on the following domain areas: executive functioning, attention, learning and memory, language and communication, sensory/perceptual/spatial abilities, motor skills and social/emotional functioning. Also included is a segment on evaluating the individual's *resourcefulness*.

## **Executive Skills:**

Executive skills involve a number of fundamental abilities that allow an individual to appraise a problem, formulate and initiate a plan of action, and monitor and make adjustments in that plan on the basis of feedback. Executive functioning includes the following sub-domains:

***Problem/Goal Identification:*** The ability to identify problems and formulate goals is dependent upon accurate self-awareness; understanding of one's abilities, limitations and needs; and a correct appreciation for the specific demands a particular goal places on the individual. It also requires that the individual project themselves into the future, anticipate potential obstacles and integrate this information into goal formulation. This behavior may be observed through statements made by the individual regarding their strengths and weaknesses, by the goals they identify and the obstacles they identify, the degree to which they talk meaningfully about their goals, and by the impact of obstacles on goal setting or reformulation. Direct inquiries may be required to obtain information on this behavior.

***Organization and Planning:*** These behaviors have to do with the ability to structure and organize information and develop a plan to accomplish goals. Planfulness refers to the development of a plan for guiding behavior toward a goal. Inherent in this is the ability to revise the plan as needed when obstacles to attainment of the goal are encountered. Within planning and organization is the ability to develop an approach to solve problems identified by generating and

weighing a number of alternative solutions. Time management and the ability to schedule based upon time estimates and organize sequentially is also critical to planning. For this to occur, an individual must set priorities and these must be incorporated into the plan/schedule. Task rules for carrying out the actions must be established and internalized to guide the individuals behavior.

Problems in planning can be directly observed by an individual's approach to problem solving or moving toward a goal. These abilities should be observed in situations where an individual must complete a complex task in which little or no instructions are given. Observations of the degree to which they prepare for action by organizing materials, assembling required materials, and proceeding in the proper sequence are examples of sound planning. Asking individuals to "think out loud" may be helpful (but may actually present a confound to assessment in that self-talk may regulate behavior in a way that would not ordinarily occur). The presence of task rules may be inferred from their performance, or from statements they make about their approach. Attempts should be made to classify the individual's problem solving as random (haphazard approaches and wild guessing), trial and error (concrete-operational □ selecting a viable solution and trying it out), or hypothetico-deductive (considering a number of possible solutions and selecting the best before implementation). Because the details of planning are usually not apparent on observation, a method may be derived for obtaining information about an individual's plan. This might involve asking them what their plan was immediately following the action. Listing the steps in their plan is another possible approach.

***Implementation and Evaluation:*** This refers to the ability to effectively follow a plan or task rules to achieve goals. The individual must be able to initiate actions toward accomplishing the goal without external cues or prompting. Self-regulation is important to implementation. Self-regulation requires that an individual accurately monitor his or her own performance throughout the activity, as well as external feedback such as environmental cues (verbalizations, facial expressions or other input from others) and examination of the product or outcome of the action. Self-correction is required when self-monitoring reveals that the action is not adequate to meet the goal, when the rules and schedules established are not effective, or at a higher level when knowledge or past experience allows the individual to modify their behavior (generalization).

Initiation is observed by whether or not action is taken without direct external influence or cues. Self-monitoring may be observed through an individual's behavior which might suggest that they are attending to internal and external cues about their performance. For example, if they are monitoring their effectiveness in understanding spoken directions, requests for clarification indicate that they are aware when information obtained is insufficient for action. Self-evaluation can be checked by asking the individual how well they did after they have completed the task, and by asking them to rate the effectiveness of their performance in completing the task.

***Cognitive Dexterity:*** This refers to the individual's ability to shift fluidly between tasks or mental sets. Higher level problem solving may require that an individual perform multiple tasks. This requires effective orientation to each task, the ability to disengage from one task and orient to and initiate another, and shift the focus of attention or the task approach to problem solving. Cognitive dexterity also refers to the ease and speed with which an individual makes the above noted shifts. Problems in cognitive dexterity are observed most clearly by perseverative behaviors in which the individual seems to get stuck in a particular approach or solution, and is unable to generate or initiate other behaviors. Dexterity may also be observed by slow processing and problem solving, by frequent shifting from task to task without accomplishment, and by a focus on one element of a solution to the disregard of other important elements.

**Attention:**

Attention is defined as the ability to maintain alertness to stimuli. Concentration or vigilance is the ability to sustain alertness to that stimuli and is attention over a period of time. Attention should be addressed across sensory input modalities, particularly visual and auditory, depending upon the demands of the problem solving situation. Higher level attentional demands, such as divided attention, should also be assessed because of the requirements for such in complex everyday problem solving. Divided attention refers to the individual's ability to selectively attend to one stimuli while maintaining an alertness and responsiveness to other types of stimuli. For example, attending to a clerical sorting by numbers task while maintaining an alertness to typographical errors in item titles.

Attention can be assessed through neuropsychological tests. However, because of the relatively short time demands and the highly structured nature of psychometric tests, these instruments may not provide accurate information on the presence and impact of attention problems. Attention can be observed in simulations and in everyday tasks that require attention such as listening to instructions or attending to a quality control task. Attention can also be assessed through behavioral observations by informants such as teachers or family members who are familiar to the individual's response to extended demands for their attention.

### **Learning and Memory:**

This domain can be defined as including: the ability to encode, store, and retrieve information that has been perceived in a manner that can occur in a typical information-providing environment (conversations, classes, book reading, telephone calls, etc.); the ability to draw on static knowledge to problem-solve; and the ability to use active learning/recall strategies to organize and recall tasks or information in the future. Like sensory input, memories can be encoded using various modalities (tactual/visual, spoken verbal and written) and can involve several types of learning and recall (factual, task/procedural, episodic, prospective).

In functional assessment, description of learning and memory should delineate between sensory modality differences in new learning, separate out awareness and access of factual knowledge from ability to generalize such, identify previous compensatory strategies, identify awareness/self-evaluation of memory ability, and describe previous/current environmental demands for various types of learning and memory. A functional description of learning and memory includes the ability to recall instructions (oral and written), spontaneous use of mnemonic or compensatory strategies, and typical methods of succeeding and handling prospective memory tasks (how to remember appointments, social commitments).

Observation of learning and memory can occur via: neuropsychological tests (especially on those tests that are more oriented to real life memory abilities like the Rivermead Behavioral Memory Test); tasks and simulations requiring memory; debriefings after assessments which require the individual to recall what and how they performed; simulations or naturalistic activities (e.g., the spontaneous use of compensatory strategies); recall of staff names, roles, etc.; recall of personal history presentation (clinical interview, job interview); and through functional rating scales completed by the individual or an informant.

## **Language and Communication Skills:**

Language skills are those primarily involved in communication of thoughts and feelings. They involve receptive or comprehension skills and expressive skills. Language is modality based, so that language may occur in spoken, written and non-verbal forms. Expressive language problems include difficulties in basic articulation or mechanical speech problems, inadequate store of vocabulary to draw from, inability to recall words or naming, substitutions of either the wrong word or nonsense words, omissions, and circumlocution, or the tendency to use an unusually large number of words to explain relatively simple ideas. Areas to be addressed include: rate of speech, voice tone, volume, and the relevance of the content of conversation.

The ability to comprehend spoken language should be assessed. It should involve a description of the level of complexity that an individual comprehends, span of comprehension or the amount of material which may be comprehended at any given time (regardless of the level of complexity), the rate at which information can be understood, and if the individual has difficulties with specific types of language (e.g., spatial terms).

The comprehension of written language should be explored along similar parameters (level of complexity, rate), as well as the individual's ability to express their thoughts in writing. Functional math skills should also be assessed.

Nonverbal communication is used to convey feelings and emotions, often more accurately than verbal communication. In assessing nonverbal language, attention should be paid to: kinesics (body language, which involves the use of the body for communication, specifically facial expressions, gestures, and posture); the use of space for communication (distance between people, spatial arrangements, and territories belonging to a person); the use of prosodic features (voice pitch, loudness, tempo and pause, paralinguistic features such as giggling or whispering, and nonlinguistic features such as yawns). The impact of clothing and cosmetics as means of communication should also be considered.

Formal language tests may be used to identify problems but the degree of functional impact may have to be identified through simulations under conditions that replicate real life demands, such as comprehending instructions in an environment that may include distractors. Naturalistic observation may also be useful, but debriefing procedures may be required to identify language breakdowns versus problems in other areas (e.g., executive functions, memory, conceptual abilities).

## **Sensory/Perceptual/Spatial Abilities:**

This involves basic awareness (sensation) and interpretation (perception) of external stimuli through a sensory modality (visual, tactile, hearing, taste, smell). Limitations or strengths should be documented in terms of current/possible compensation, functional limitations, awareness of sensory status, and impact on higher level cognitive and emotional functions. Etiology (central/peripheral nervous system, organ disease, etc.) should also be assessed and discussed. Spatial skills involve the ability to perform analysis of complex visual information such as two and three dimensional designs and models, perform spatial operations mentally (rotate images, visualize), accurate sense of direction and temporal (time) analysis, and are also linked to constructional (drawing, building) abilities.

Higher-level cognitive problems with awareness of body part location and body movement in relation to objects should be assessed with functional uses in mind, such as ambulation, awareness of self-presentation in public, "wandering" limbs, and balance/gait. In functional assessment with an individual, the ability to hear and speak well enough to carry on a conversation in various environments (party, outside, with distractions, etc.), ability to read books/magazines, signs outside, and to see well enough to make sense of moving objects/distance judgement, and the capacity to walk around safely should be evaluated. The ability to handle any routine physical manipulation at home or work, such as tool use should be defined. Reported changes or problems in taste or smell should be explored in terms of safety issues (fire, gas, poison protection), and personal level of adjustment to sensory changes. Describe the individual's personal perspective on sensory loss (expectation for improvement vs. understanding of performance), personal and significant other attributions of sensory loss (hurt arm vs. central nervous system changes). Also explore the impact of sensory changes on self-confidence, interpersonal/intimate relationships, social anxiety.

Sensory problems are observed during interview, neuropsychological tests, simulations or naturalistic observation.

### **Motor Skills:**

Motor functioning involves carrying out some purposeful activity requiring fine motor or gross motor skills. Assessment should encompass speed or rate of activity, coordination or sensorimotor integration (eye-hand, auditory-motor, and tactual-motor). Control and regulation of motor functions is through the brain, and even subtle injuries or developmental abnormalities may have impact on motoric skills. Any problems in planning and carrying out routine motor acts (apraxia) or pretended movements should be identified. Gross motor skills including walking should be investigated. The interaction of other cognitive skills on motor function should be noted, such as impaired coordination during divided attention tasks. Assessment of motor skills can occur on psychometric tests, in simulations, or in observations of everyday activities.

### **Social/Emotional:**

This domain relates to a number of areas including social skills, interaction, social awareness, and emotional status. It is the ability to monitor impact of self on others, to modify verbal/pragmatic communication skills in response to others towards a goal, and the degree/character of emotional response to real or perceived events in external environment. It also involves affective responses, awareness of what these are modified by, and ability to co-exist and maintain minimum functional level concurrent with strong affective response.

Functional assessment of social/emotional status includes solicitation of independent opinions from the individual and from others regarding performance in relationships, public behavior, and determination of overall description and attributions of the individual's social/emotional status by others. Investigation of social milieu/values, pre-injury psychological history and ways of coping, previous versus current number of friends, relationship partners, social contacts, and satisfaction with all should be undertaken. Functional assessment should explore emotional reaction to current circumstances (unaware of changes, performance anxiety, social isolation, etc.), self-esteem and self-concept (i.e., "damaged goods" versus "new lease on life"). It should describe general life philosophy, especially regarding disability status, and explore

ramifications for cognitive distortions, self-limiting restrictions, and depression. If social/emotional problems are suspect, the suspected etiology should be cited and evidence for the source of problems (characterological, catastrophic reaction, organic etiology, adjustment reaction, etc.) should be described. Social/emotional status also includes the individual's perspective on changeability, locus of responsibility in change, and motivation/willingness to participate in intervention (psychotherapy, cognitive rehabilitation, medication, exercise, social skills training, etc.) Social/emotional abilities can be observed during the interview, in interpersonal interactions on simulations, on role plays, and in informal contact and waiting room behavior.

### **Assessment of Resourcefulness:**

In functional assessment, identification of resources that are available to the individual, and the individual's ability to access and utilize resources, is important for planning rehabilitation intervention. Assessment involves resource awareness and use, activities of daily living, transportation, instrumental activities such as telephone use, budgeting and shopping, and use of disability-related community information and supports such as peer groups, literature, workshops, etc.

Resourcefulness is described as the ability to employ existing knowledge base, new learning skills, communication skills, and social skills toward problem-solving or goal attainment in such a way that makes use of external things, either individuals (friends or paid professionals), literature, systems, etc. toward personally determined and temporally relevant objectives.

Functional assessment of resource awareness requires some appreciation on the examiner's part of the individual's current needs and circumstances (finances, home management status, emotional needs, etc.) to determine if the individual is matching needs with resources. It is important to describe both successful and failed attempts at learning about and using community resources (appeal of SSI, returned phone calls from caseworker, talks to others with similar problems, goes to support groups repeatedly). One should evaluate whether or not an individual can explain their role in using resources (fill out forms, go to appointment, send in check, etc.) and can identify competence to follow through with examples of independent work. Assessment should document assistance by others and attitudes toward level of responsibility. It should describe the individual's insight into usefulness and availability of community resources, and any stated obstacles to using such resources (transportation, can't fill out forms, too much work, no one with my problems, no friends to ask, etc.). The person's general orientation toward problem-solving (hopeless/insecure or paralyzed versus proactive versus overbearing/intrusive) should be described.

Functional assessment of resourcefulness can be undertaken in interview, simulations, observation in naturalistic settings, and through clarification questions on various tasks and simulations. It can also be observed in mock job interviews.

## Vocational Impact of Cognitive Disabilities

For assessment to be optimally useful, results should yield information on how the individual functions in the natural environment, when faced with work, education and training, and independent living demands. Assessment conducted in a vacuum with little relevance to real world demands is of limited use in the planning and delivery of rehabilitation services. However, due to the complex and invisible nature of cognitive disability, the impact is often difficult to discern, both for the individual and the counselor. Due to insight difficulties, or simply due to the fact that individuals have been trained through their involvement in rehabilitation to focus upon their "deficits," they may not readily understand or present how the deficits affect them on a daily basis. Assessment resources available to the counselor typically address deficit identification and diagnosis, not functional obstacles. Identification of impact involves comparing information on cognitive abilities with the specific cognitive demands placed on the individual. It requires: a) functional assessment of the individual; b) analysis of the cognitive demands of the environment and/or goal; and c) integration of this information to identify the specific impact of the disability and the obstacles to goal attainment. From this information, a specific rehabilitation plan can be developed and initiated.

While determining impact is highly individualized, the following Table 2 (page 24) presents examples of how impediments in specific areas of cognitive functioning have vocational impact. The table is designed to assist the counselor to understand the range of possible obstacles that might result from a cognitive disability. Potential vocational and everyday impacts are listed for each of seven cognitive domains. The table should be used as a general guide, to better understand the overall impact of cognitive disability, however, in conducting a functional assessment with an individual, the vocational and everyday impact is determined through careful analysis and integration of the individual's abilities and limitations with the specific cognitive demands placed on the individual.



**Table 2**  
**Cognitive Impact Table**

<b>Cognitive Domain</b>	<b>Everyday and Vocational Impact of Deficits</b>
<b>Executive Functioning</b>	<ul style="list-style-type: none"> <li>- disorganized or unfocused job search strategies</li> <li>- confusion over how to register for classes</li> <li>- excessive time and distress when grocery shopping</li> <li>- unable to determine vocational goals</li> <li>- chronic tardiness or missed deadlines</li> <li>- unable to schedule own time or projects effectively</li> <li>- unaware of how supervisors assess their work</li> <li>- often surprised and unprepared for problems on the job</li> <li>- unrealistic expectations</li> <li>- slow to "catch on" to office procedural changes</li> <li>- poor follow-through on direction or assignments</li> </ul>
<b>Attention</b>	<ul style="list-style-type: none"> <li>- loses track of current task</li> <li>- frequently observed to be "off-task"</li> <li>- unable to sit through a lecture at school</li> <li>- difficulty proof-reading</li> <li>- excessive socialization</li> <li>- distracted by outside noise</li> </ul>
<b>Language and Communication</b>	<ul style="list-style-type: none"> <li>- difficulty with telephone use, misunderstands messages</li> <li>- poor or very slow report writing</li> <li>- does not catch on to "hints" from others</li> <li>- talks too slowly for others</li> <li>- confuses other staff when attempting to explain or teach job tasks</li> <li>- frequently misinterprets supervisor memos</li> </ul>
<b>Sensory Perceptual</b>	<ul style="list-style-type: none"> <li>- may get lost easily</li> <li>- unable to learn how to read blueprints</li> <li>- requires repetition/simplification of messages</li> <li>- incorrect recording of telephone messages</li> <li>- unable to recognize differences between similar work materials</li> <li>- problems assembling items from a diagram</li> </ul>
<b>Motor Skills</b>	<ul style="list-style-type: none"> <li>- clumsiness or slowness handling equipment</li> <li>- frequent accidents/injury on the job</li> <li>- messy work samples due to poor dexterity</li> <li>- slow or inaccurate typing, data entry, or handwriting</li> <li>- problems with mobility or lifting</li> </ul>
<b>Social/Emotional</b>	<ul style="list-style-type: none"> <li>- history of conflict with supervisors or coworker</li> <li>- unable to "connect" with customers or deal with complaints</li> <li>- problems accepting constructive feedback</li> <li>- highly distressed or agitated over everyday work demands</li> <li>- perceived as cold or unhelpful by retail customers</li> <li>- shares personal life details with clients or coworkers</li> </ul>

# **A Framework for Functional Assessment**

To serve as a guide to practitioners conducting functional assessments with individuals with cognitive disabilities, Tables 3 through 9 (pages 26-39) present a framework for assessing the functional manifestations of cognitive disabilities across the seven domains. For each domain table, information is listed regarding what to assess and how to go about the assessment in six procedural categories:

- 1) use of existing information;
- 2) functional interviewing;
- 3) incidental behavioral observations;
- 4) psychological testing;
- 5) rating scales and questionnaires; and
- 6) direct observation in simulated and natural environments.

## EXECUTIVE FUNCTIONING

Existing Information	Interview	Incidental Observation	Questionnaires	Testing	Simulations and Naturalistic Observations
<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- History of developmental or acquired brain injury to the frontal/subcortical regions</li> <li>- Reference to anosognosia, disinhibition, lack of initiation, perseveration</li> <li>- History of job loss or poor school performance with reference to poor attendance, lack of organizational skills, tardiness, poor preparation</li> <li>- Difficulties with schedules and in unfamiliar environments</li> <li>- Lack of study skills</li> </ul> <p><b>Where to look? (referral, medical, school/training, work, testing, volunteer, recreation, etc.)</b></p> <ul style="list-style-type: none"> <li>- Medical records</li> <li>- School records</li> <li>- Employment records</li> <li>- Previous testing</li> <li>- Permanent products (projects, portfolios, papers, resume, etc.)</li> <li>- Previous rehabilitation records</li> <li>- Therapy records and MH contacts</li> <li>- Vocational training records</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Client reports of difficulty organizing everyday tasks (e.g. organizing and prioritizing weekly school assignments)</li> <li>- Informant reports or client reports and performance</li> <li>- Unrealistic views of work or academic standards</li> <li>- Inability to identify own strengths or weaknesses</li> </ul> <p><b>How to get the information?</b></p> <ul style="list-style-type: none"> <li>- Ask client how certain activities in their life are carried out, gaining information on their executive abilities. (e.g. prompt how they plan a party, how s/he remembers or stores important telephone numbers, opening and storing daily mail).</li> </ul> <p><b>Who to talk to?</b></p> <ul style="list-style-type: none"> <li>- Interview with client and significant other</li> <li>- Interview past teacher or therapist</li> <li>- Interview a work supervisor</li> </ul>	<p><b>What are you looking to observe?</b></p> <ul style="list-style-type: none"> <li>- Arriving on time and on the correct day for appointments</li> <li>- Requesting information</li> <li>- Using a scheduling book or calendar</li> <li>- Anticipating length of stay and planning or it (e.g. babysitting, lunch)</li> <li>- Bringing in required information or materials</li> <li>- Follow through with assignments</li> <li>- Arranging for novel requests</li> <li>- How novel information is obtained</li> </ul> <p><b>Where are these behaviors observed?</b></p> <ul style="list-style-type: none"> <li>- During the interview</li> <li>- During the formal assessment, counseling or training sessions</li> <li>- Lunch and coffee breaks</li> <li>- In any other setting such as an a voc eval, on the job etc.</li> </ul> <p><b>And when?</b></p> <ul style="list-style-type: none"> <li>- Phone calls to schedule appointments</li> <li>- During the interview and assessment</li> <li>- When activities are changed</li> </ul>	<p><b>What questionnaires?</b></p> <p>PAF and RAF PCRS and PCRS-R DEX</p> <p><b>Which items?</b></p> <p>PAF and RAF - Items 6-10, 25-28, 30-34, 38, 42-48 PCRS and PCRS-R - 1-8, 12, 15, 16, 24, and 26</p> <p><b>How administered?</b></p> <ul style="list-style-type: none"> <li>- By VR counselor</li> <li>- By Educators or School Counselors</li> <li>- By Voc Evaluator</li> <li>- By Psychologist</li> </ul> <p><b>To whom?</b></p> <ul style="list-style-type: none"> <li>- Client</li> <li>- Significant Others</li> </ul>	<p><b>Which tests?</b></p> <p><b>Traditional Tests:</b></p> <ul style="list-style-type: none"> <li>- Wisconsin Card Sort Test</li> <li>- Trails</li> <li>- Porteus Maze</li> <li>- Category</li> </ul> <p><b>Less Traditional:</b></p> <ul style="list-style-type: none"> <li>- Cognitive Estimates</li> <li>- Tower of Hanoi, etc.</li> <li>- Six Elements (BADS)</li> <li>- Tinkertoy Test</li> <li>- Field of search (BADS)</li> </ul> <p><b>Administration issues?</b></p> <ul style="list-style-type: none"> <li>- Needs to be administered by a person familiar with administration and interpretation of neuropsychological tests</li> </ul> <p><b>Interpretation issues?</b></p> <ul style="list-style-type: none"> <li>- The evaluator should rely on observation data and historical information because traditional neuropsychological testing may not be effective in ascertaining subtle deficits in executive functioning</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Ability to set goals</li> <li>- The individual's ability to sequentially organize multiple tasks</li> <li>- Planning and the steps involved</li> <li>- Information gathering</li> <li>- Processing information that is complex and sometimes contradictory</li> <li>- Evaluate own performance</li> </ul> <p><b>How to design a simulation in this area from scratch (e.g., role play); What to include?</b></p> <ul style="list-style-type: none"> <li>- Tasks should be open ended to allow the evaluator to glean information about the client's internal processing of information</li> <li>- Tasks should require the client to envision the outcome, and the outcome should not be apparent from the prompts given to complete the task</li> </ul> <p><b>How to modify an existing procedure (e.g., work eval) to include information on this domain?</b></p> <ul style="list-style-type: none"> <li>- Combine multiple tasks</li> <li>- Have the client perform the tasks over an extended time and/or over several days.</li> <li>- Modify degree of structure in task (e.g., cues or prompts)</li> <li>- Ask individual to self-evaluate</li> </ul>

## ATTENTION

Existing Information	Interview	Incidental Observation	Questionnaires	Testing	Simulations and Naturalistic Observations
<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Evidence of ADD diagnoses, medication; reports of hyperactivity, distractability, impulsivity</li> <li>- Presence of special education, or other placements (S&amp;ED)</li> <li>- Evidence of behavior control problems</li> <li>- Evidence of brain injury, concussion, LOC</li> </ul> <p><b>Where to look?</b></p> <ul style="list-style-type: none"> <li>- School records, teacher observation, test reports; by medical history,</li> <li>- Family and teacher reports</li> </ul>	<p><b>How to get the information?</b></p> <ul style="list-style-type: none"> <li>- Direct questioning regarding inattention, impulsivity, hyperactivity</li> <li>- Use DSM-III criteria as a prompt...should orient the questioning to adult issues.</li> <li>- Ask if problems in past in school, work, social, recreation, etc</li> <li>- Ask about subjective feelings of restlessness (can't sit still, caged animal, etc.) Ask if currently a problem; if distractible, by what, when, how often.</li> <li>- Ask does anything work to reduce the problem; do you do anything to compensate?</li> <li>- Use indirect methods of questioning: How long do you attend to book/ magazine/tv/movie? How long can you attend to a formal speaker? informal conversation? Describe how you go about home or work projects? what is the typical course that you take? Do you typically finish projects in one setting, or jump around? How many (unfinished) projects have you got going? What was the last thing you completed?</li> </ul> <p><b>Who to talk to?</b></p> <ul style="list-style-type: none"> <li>- Individual</li> <li>- Parent, spouse or sibling</li> <li>- Teacher, academic support provider</li> <li>- Work supervisor</li> </ul>	<p><b>What are you looking to observe?</b></p> <ul style="list-style-type: none"> <li>- Evidence of distractability (looking around during conversation or task, attention to objects in room, extraneous sounds, looking out the window)</li> <li>- Doesn't seem to be listening to what you say.</li> <li>- Requires frequent repetition. Can't sit still, restless. Blurts out answers before question is finished. Acts on task before cued to do so, such as beginning to write before instructions are finished. Makes careless errors, doesn't keep track of time or pace self.</li> </ul> <p><b>Where and when are the behaviors observed?</b></p> <ul style="list-style-type: none"> <li>- Interview</li> <li>- On tasks (testing, filling out forms, etc.)</li> <li>- While waiting</li> <li>- When bored</li> <li>- In the presence of distractors</li> </ul>	<p><b>Which Questionnaires?</b></p> <p>LD Characteristic Checklist (Dowdy) PCRS PAF Connors</p>	<p><b>Administration/Interpretation Issues:</b></p> <p>Caution that traditional psychometric tests that are described as sensitive to attention may be too structured and too short to fully tax attention, concentration and vigilance demands. For example, the attention triad of Digit Span, Arith, and Digit Symbol of the WAIS may miss even significant attention difficulties. Longer and more challenging tests must be used, but only secondary to history and direct observation. Also, recognize that inferences about attention may also be confounded by other problems (e.g., comprehension, motor, visual)</p> <p><b>Tests:</b></p> <p>Digit Vigilance PASAT Seashore Rhythm Digit Span Digit Symbol (&amp; Symbol Digit) Divided attention Continuous performance (preferable due to extended time requirements)</p>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Attention and on-task capabilities</li> <li>- Impulsivity</li> <li>- Hyperactivity</li> <li>- Problems with task focus</li> <li>- Distractability</li> <li>- Vigilance</li> </ul> <p><b>How to design a simulation?</b></p> <ul style="list-style-type: none"> <li>- Long periods of focussed attention</li> <li>- divided attention (alertness to one stimuli while attention focused on another)</li> <li>- response to varying degrees and types of distractors on performance</li> <li>- quality control tasks (error tracking)</li> </ul> <p>Consider modifying existing approaches to vary distractors</p> <p><b>How to modify an existing procedure (e.g., work eval) to include information on this domain?</b></p> <ul style="list-style-type: none"> <li>- Investigate modifications (e.g., distractor screens, secluded placement) and accommodations (e.g., cuing mechanisms)</li> </ul>

## LEARNING AND MEMORY

Existing Information	Interview	Incidental Observation	Questionnaires	Testing	Simulations /Naturalistic Observations
<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Existing diagnosis of "mental retardation", "borderline" or "low" IQ, or "learning disability".</li> <li>- Previous history of special education services, including special classroom placement or learning support.</li> <li>- History of medical conditions linked to memory and learning problems, including labor and delivery problems, anoxia, cerebral palsy, head injury, brain tumor, encephalitis, or meningitis</li> <li>- Description by individual or informants as "slow learner", "forgetful" or "absent-minded".</li> <li>- History of academic failure or difficulty in training programs</li> <li>- History of difficulty with Math, Reading, "taking in information" or "remembering things".</li> <li>- History of failure in more complex jobs as opposed to routine jobs</li> </ul> <p><b>Where to look?</b></p> <ul style="list-style-type: none"> <li>-Medical records</li> <li>-School records</li> <li>-Previous testing</li> <li>-Previous rehabilitation records</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Does the individual seem to grasp information provided in the interview, and can they retain it from the beginning of the session till the end? Can they retain information from one session to the next?</li> <li>- Is the individual an accurate, organized informant?</li> <li>- Can he/she provide a complete history?</li> <li>- Does the individual demonstrate an understanding of "real life" information - such as public transportation or their own finances?</li> <li>- Does the individual have areas of interest in which they particularly knowledgeable such as sports, gardening, cars, etc.</li> <li>- Can the individual describe their own learning style, including strengths and weaknesses?</li> <li>- How does the individual typically get information they need e.g. from TV, the newspaper, library, word of mouth, use of social agencies, formal schooling?</li> </ul> <p><b>How to get the information ?</b></p> <ul style="list-style-type: none"> <li>- Interview client and significant other</li> <li>- Interview past teachers / therapists</li> <li>- Interview a work supervisor</li> </ul>	<p><b>What are you looking to observe?</b></p> <ul style="list-style-type: none"> <li>-Problems in processing information, especially when it is complex</li> <li>-Problems retaining information that has been understood e.g. can individual remember your name, how to find your office after the first trip, what the procedures are for signing in.</li> <li>- Problems remembering what needs to be done and doing it at the right time e.g., completing assignments, getting to appointments</li> <li>- Differences in ability to remember things independently vs. ability to remember when given a cue</li> <li>- Ways in which the individual helps him or herself to learn and remember; e.g. writing things down, bringing a helper or advocate, asking for repetition and clarification, checking for accuracy</li> </ul> <p><b>Where are these behaviors observed?</b></p> <ul style="list-style-type: none"> <li>- Waiting room: Chatting with receptionist, or others waiting</li> <li>- In the assessment, counseling or training setting</li> <li>_ In staffings or other meetings</li> </ul> <p><b>And When?</b></p> <ul style="list-style-type: none"> <li>- Phone calls to schedule appointments</li> <li>- Lunch and coffee breaks</li> <li>- During formal assessment, counseling or training sessions</li> </ul>	<p><b>What questionnaires?</b></p> <ul style="list-style-type: none"> <li>- EMQ</li> <li>- PAOF</li> <li>_ PCRS and relative PCRS</li> </ul> <p><b>Which items?</b></p> <p>PAF - Scale II Language and Communication</p> <p>PCRS - Items related to starting conversations, getting help when confused, participating in groups, understanding directions, recognizing others' responses.</p> <p><b>How Administered?</b></p> <ul style="list-style-type: none"> <li>- By VR Counselor</li> <li>- By Educators or School Counselors</li> <li>- By Voc Evaluator</li> <li>- By Psychologist</li> </ul> <p><b>To Whom?</b></p> <ul style="list-style-type: none"> <li>- Client</li> <li>- Significant others</li> </ul>	<p><b>Which Tests?</b></p> <p><u>Learning - IQ</u></p> <p>WAIS -R Stanford-Binet Kaufman Ravens Progressive Matrices Liter WJB - R Part 1 Detroit Test of Learning Aptitude Test of Nonverbal Intelligence (TONI)</p> <p><u>Academic Achievement</u></p> <p>Woodcock-Johnson -Battery, Revised, Part II WRAT Metropolitan Achievement Tests SAT's ACT's Reading Batteries <u>Memory</u></p> <p>WMS-R MAS RBMT California Verbal Learning Rey Ostereith Verbal Learning</p> <p><b>Interpretation Issues</b></p> <p>Learning disabilities may account for an artificially low IQ score</p> <p>Cultural differences will impact IQ scores and Achievement tests</p> <p>Language difficulties will have a negative impact on IQ and achievement tests</p>	<p><b>What to look for?</b></p> <p>Difficulty processing instructions even when they are presented in a variety of formats including demonstration</p> <p>Failure to retain instructions or procedures</p> <p><b>How to design a simulation in this area from scratch (e.g. role play). What to include:</b></p> <ul style="list-style-type: none"> <li>- Giving the individual an opportunity to learn any novel skill e.g., sending a FAX,</li> <li>- Identify follow up procedures involving appointments, mail card, etc (prospective memory)</li> <li>- Have them read an article or procedural manual and cue for recall of information (look at output modalities - say &amp; write vs do)</li> <li>- Create variety of learning modality tasks to determine best modality</li> </ul> <p><b>How to modify an existing procedure:</b></p> <ul style="list-style-type: none"> <li>- Rate memory and new learning in interviews, work evals, staffings.</li> <li>- Try providing instructions in a variety of modalities. Try looking for delayed recall after several hours or several days. Look for incidental learning.</li> <li>- Add "recall" requests to routine tasks (e.g., question them as to the steps they took to complete a task afterwards)</li> </ul>

## COMMUNICATION

Existing Information	Interview	Incidental Observation	Questionnaires	Testing	Simulations /Naturalistic Observations
<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Previous history of speech and/or language problems including: late onset of development, poor intelligibility, limited oral motor functions, receptive or expressive language problems, dysfluency, voice disorders, hearing loss, history of chronic ear infections, structural anomalies such as a cleft lip or palate.</li> <li>-History of speech therapy</li> <li>- Primary language other than English - including use of ASL</li> <li>- Use of hearing aids, or adaptive communication devices</li> </ul> <p><b>Where to look?</b></p> <ul style="list-style-type: none"> <li>-Medical records</li> <li>-School records</li> <li>-Previous testing</li> <li>-Previous rehabilitation records</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>-What is the primary method of communication? <ul style="list-style-type: none"> <li>Spoken language? Which?</li> <li>Sign language?</li> <li>Writing?</li> <li>Use of communication device?</li> </ul> </li> <li>-Any unusual communication style? Accent or dialect?</li> <li>- Is the individual easily understood? If not, why not? <ul style="list-style-type: none"> <li>Articulation?</li> <li>Loudness?</li> <li>Rate?</li> <li>Expressive language?</li> <li>Word finding?</li> <li>Fluency?</li> <li>Staying on topic?</li> <li>Use of a communication system different than yours?</li> </ul> </li> <li>- Does the individual seem to understand you? Do they have any difficulty: <ul style="list-style-type: none"> <li>Hearing you?</li> <li>Understanding your words?</li> <li>Paying attention as you speak?</li> </ul> </li> <li>- Can the individual follow simple directions? Complex directions?</li> <li>- Can the individual rephrase what you have said in his/her own words verbally or through an alternate communication method?</li> <li>- Does the individual ask for information to be repeated or clarified?</li> <li>- Does the individual ask for more time to express his/her ideas?</li> <li>- Can the individual manage the "rules" of polite conversation? Turn taking? Choosing appropriate topics?</li> </ul> <p><b>How to get the information ?</b></p> <ul style="list-style-type: none"> <li>- Interview client and significant other</li> <li>- Interview past teachers / therapists</li> <li>- Interview a work supervisor</li> </ul>	<p><b>What are you looking to observe?</b></p> <ul style="list-style-type: none"> <li>- Failures to communicate</li> <li>- Individual's awareness of miscommunications</li> <li>- Ability to seek out information</li> <li>- Ability to express ideas</li> <li>- Individual's style and judgement in making social contact</li> </ul> <p><b>Where are these behaviors observed?</b></p> <ul style="list-style-type: none"> <li>- Waiting room: Chatting with receptionist, or others waiting</li> <li>- In the assessment, counseling or training setting</li> <li>_ In staffings or other meetings</li> </ul> <p><b>And When?</b></p> <ul style="list-style-type: none"> <li>- Phone calls to schedule appointments</li> <li>- Lunch and coffee breaks</li> <li>- During formal assessment, counseling or training sessions</li> </ul>	<p><b>What questionnaires?</b></p> <ul style="list-style-type: none"> <li>- PAF &amp; RAF</li> <li>_ PCRS and relative PCRS</li> </ul> <p><b>Which items?</b></p> <p>PAF - Scale II Language and Communication</p> <p>PCRS - Items related to starting conversations, getting help when confused, participating in groups, understanding directions, recognizing others' responses.</p> <p><b>How Administered?</b></p> <ul style="list-style-type: none"> <li>- By VR Counselor</li> <li>- By Educators or School Counselors</li> <li>- By Voc Evaluator</li> <li>- By Psychologist</li> </ul> <p><b>To Whom?</b></p> <ul style="list-style-type: none"> <li>- Client</li> <li>- Significant others</li> </ul>	<p><b>Which Tests?</b></p> <ul style="list-style-type: none"> <li>-Audiological Evaluation</li> <li>-Boston Diagnostic Aphasia Exam</li> <li>-Boston Naming Tests</li> <li>-Western Aphasia Exam</li> <li>-Controlled Oral Word Association Test</li> <li>-Token Test</li> <li>-Speed and Comprehension of Language Processing</li> <li>-Psycholinguistic Assessments of Language Processing in Aphasia</li> <li>-Peabody Picture Vocabulary Test</li> <li>-Test of Language Competence</li> <li>-Clinical Evaluation of Language Function</li> <li>-Oral Directions Test</li> <li>-WAIS-R Vocabulary, Similarities and Comprehension Subtests</li> </ul> <p><b>Administration Issues</b></p> <ul style="list-style-type: none"> <li>- Tests should be administered by a qualified professional</li> </ul> <p><b>Interpretation Issues</b></p> <ul style="list-style-type: none"> <li>- Tests developed for Aphasia may not detect subtle language processing problems, and not usually well normed for younger populations</li> <li>- Developmental language tests normed only through high school age, but provide good clinical information in adult populations</li> <li>- WAIS subtests are not tests of language per se, but performance will be grossly affected by language competence</li> <li>- Test performance by individuals who typically use a communication system other than spoken English should be interpreted with caution</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Communication failures: whenever speaker of listener fails to "get the message".</li> <li>-Awareness of communication failures</li> <li>- Any approaches to repairing failed communications</li> <li>- Initiation of communication</li> <li>- Social communication skills</li> <li>- Nonverbal communication skills</li> <li>- Pragmatic communication skills - issues such as tone of voice, selection of topics, choosing the most appropriate words and phrases, timing.</li> </ul> <p><b>How to design a simulation in this area from scratch (e.g. role play). What to include:</b></p> <p>Opportunities for a variety of communication tasks:</p> <ul style="list-style-type: none"> <li>-Social conversation</li> <li>-Following directions</li> <li>-Giving directions</li> <li>-Seeking information or clarification</li> <li>-Making requests</li> <li>-Stating an opinion</li> </ul> <p>Face to face communication as well as phone or TTY communication. Individual can call for information, and ask in person.</p> <p>Comparison of communication in a variety of settings with a variety of listeners</p> <p>Examples: getting ticket or schedule information, registering a complaint, dealing with confusing or incomplete directions</p> <p><b>How to modify an existing procedure:</b></p> <p>Rate communication in mock job interviews, work evals, staffings. Try providing incomplete or confusing directions.</p>

## SENSORY-PERCEPTUAL/SPATIAL

Existing Information	Interview	Incidental Observation	Questionnaires	Testing	Simulations and Naturalistic Observations
<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Look for evidence of impairment of peripheral visual, hearing or tactual problems.               <ul style="list-style-type: none"> <li>- Visual impairment</li> <li>- Hearing impairment</li> <li>- Orthopedic, nerve damage to hands, arms</li> </ul> </li> <li>- Look for evidence of a processing problem in school records. In school records, a processing problem may take the form of a "diagnosis" or may be used as a descriptive term. Accommodations used in classroom for such problems may be noted (sits near the teacher to better hear what is said or see what is written on the board).</li> <li>- Medical evidence of a condition that would influence sensory perception (e.g. stroke, or other focal lesion) or a developmental condition that would result in poor coordination between the senses and motor output (e.g., visual-motor or tactual motor problems).</li> <li>- Look for poor results on tasks, tests or situations which require sensory integration and processing (e.g., sports, shop, crafts, arts, etc.</li> <li>- Evidence of treatment for sensory problems (sensory integration)</li> </ul> <p><b>Where to look?</b></p> <ul style="list-style-type: none"> <li>- School records</li> <li>- medical records</li> <li>- vocational evaluation</li> <li>- employer records</li> <li>- previous testing</li> </ul>	<p><b>How to get the information?</b></p> <p>Ask about preferred modes of learning or processing; screen for difficulties with visual, hearing or hands-on (touch) activities;</p> <p>Ask about how individual learns optimally, ask them to describe situations in which they are successful or feel confident.</p> <p>Ask about hobbies that might have sensory demands (baseball, stamp collecting, ham radio) - or ask about their interest level in activities that have sensory perceptual demands.</p> <p>Inquire with informants about similar issues; (if parent is informant) inquire about such issues while individual was growing up.</p> <p><b>Who to interview?</b></p> <ul style="list-style-type: none"> <li>- Individual</li> <li>- Parents and spouses</li> <li>- teachers</li> <li>- employer/supervisors</li> <li>- physicians</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Look for evidence of problems in visual perception (e.g., inability to read map to find office, difficulties in problem solving when faced with visual requirements.</li> <li>- Look for evidence of reduced efficiency due to verbal/auditory input; look for discrimination problems in "mishearing" words; look for problems in hearing ability when other noises are present (others talking or radio).</li> <li>- Look for tactual motor problems such as clumsiness or awkwardness, difficulty handling fine objects such as pencils, coins or drinks.</li> </ul> <p><b>Where and when observed?</b></p> <ul style="list-style-type: none"> <li>- During testing or interview</li> <li>- in the waiting room</li> <li>- lunch or coffee break</li> </ul>	<p><b>What questionnaires?</b></p> <p>Use cognitive disabilities questionnaires like the PAF or the PCRS, or even some more generic rehab questionnaires like the FAC (ok due to the more physical/sensory nature of this domain)</p> <p><b>How administered?</b></p> <p>Look into "learning style" questionnaires that were popular in identifying the learning preferences of persons with LD. Look at individuals preferences for visual/hearing or hands on activities on such questionnaires.</p>	<p><b>Which tests?</b></p> <p>Visual</p> <ul style="list-style-type: none"> <li>- WAIS (PC,PA,BD,OA,DSym)</li> <li>- Hooper</li> <li>- Benton Line, Faces, Forms</li> <li>- Money Map</li> <li>- Trails</li> <li>- Category</li> <li>- Visual sensation, visual fields</li> <li>- Imbedded figures</li> </ul> <p>Auditory</p> <ul style="list-style-type: none"> <li>- Speech Sounds</li> <li>- Rhythm</li> <li>- LNNB Rhythm and Language</li> <li>- PASAT</li> <li>- Hearing sensation test (SPE)</li> </ul> <p>Tactile</p> <ul style="list-style-type: none"> <li>- Tactile Performance test</li> <li>- Motor tests</li> <li>- Stereognosis (TFR)</li> <li>- Touch sensation tests (FT#W, SPE)</li> <li>- LNNB Tactile</li> <li>- McCarron Dial</li> </ul> <p><b>Administration/Interpretation issues?</b></p> <ul style="list-style-type: none"> <li>- Acknowledge breach of standardization due to sensory problems (and implications for interpretation)</li> <li>- Sensitive to alternative explanations for perceptual deficits</li> <li>- Test and report strengths</li> </ul>	<p><b>How to develop simulations?</b></p> <p>Set up situations with multiple sensory input and output options for similar problem solving demands (have visual, hearing or modeling input requirements for the same task). Tap someone's ability to follow diagrams.</p> <p>Have individual learn by watching/doing.</p> <p>Set up simulations with competing auditory (or visual) stimuli to detect deterioration of performance due to sensory processing difficulties.</p> <p><b>How to modify existing procedures?</b></p> <p>Vary work samples to address the above outcomes. Select work samples or job tasks which have identifiable sensory perceptual demands.</p>

## MOTOR

Existing Information	Interview	Incidental Observation	Questionnaires	Testing	Simulations and Naturalistic Observations
<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Developmental history that indicates delays in motor development, reports of clumsiness</li> <li>- History of brain illness or injury that has manifested in weakness or paralysis</li> <li>- Surgery or injury to bones, tendons, muscles</li> <li>- Chronic illness effecting muscles or endurance such as arthritis, Parkinson's disease, Lupus, etc.</li> <li>- Successful participation in competitive sports</li> <li>- Areas of strength such as proficient typing skills</li> <li>- Prior work history where jobs involved rapid fine motor skills or coordinated gross motor abilities</li> </ul> <p><b>Where to look? (referral, medical, school/training, work, testing, volunteer, recreation, etc.)</b></p> <ul style="list-style-type: none"> <li>- Medical records</li> <li>- School records</li> <li>- Previous testing</li> <li>- Previous rehabilitation records</li> <li>- Vocational training records</li> <li>- Employer records</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Client report of delays or limitations in motor abilities</li> <li>- Report of strength or weakness in functional abilities such as playing a musical instrument, typing, playing sports</li> <li>- Ask about the client's physical abilities when growing up (e.g. was she usually picked to be on teams in gym class, etc)</li> <li>- Ask about current limitations in strength or endurance</li> <li>- Any previous unsuccessful attempts to acquire a skill such as learning to dance, type, play piano</li> <li>- Client report of any injury or illness that would effect endurance or motor abilities</li> </ul> <p><b>How to get the information?</b></p> <ul style="list-style-type: none"> <li>- Interview with client and significant other</li> <li>- Interview past employer or teacher</li> </ul>	<p><b>What are you looking to observe?</b></p> <ul style="list-style-type: none"> <li>- Awkward or clumsy gait</li> <li>- Limp</li> <li>- Slow walking speed</li> <li>- Weakness on either side</li> <li>- Difficulty holding a pencil</li> <li>- Unusual grip or approach to grasping small objects</li> <li>- Lack of symmetry of movement</li> <li>- Difficulty standing, sitting, or getting up</li> </ul> <p><b>Where and when are these behaviors observed?</b></p> <ul style="list-style-type: none"> <li>- While the client is walking between offices</li> <li>- In the course of testing</li> <li>- In any other settings such as in a voc eval, on the job, etc</li> </ul> <ul style="list-style-type: none"> <li>- When the client arrives or leaves, or changes activities</li> </ul>	<p><b>What questionnaires?</b></p> <ul style="list-style-type: none"> <li>- PAF and RAF</li> <li>- PCQ</li> <li>- FAI</li> </ul> <p><b>Which items?</b></p> <ul style="list-style-type: none"> <li>- Items that refer to use of hands, arms, ability to get around, and ability to do heavy work</li> </ul> <p><b>How administered?</b></p> <ul style="list-style-type: none"> <li>- Client can complete the inventory independently or items can be read to the client</li> </ul> <p><b>To whom?</b></p> <ul style="list-style-type: none"> <li>- Client</li> <li>- Significant others</li> </ul>	<p><b>Which tests?</b></p> <ul style="list-style-type: none"> <li>- Tapping</li> <li>- Grip Strength</li> <li>- Tactual Perceptual Test</li> <li>- Grooved pegboard</li> <li>- Digit Symbol</li> <li>- Digit Vigilance</li> </ul> <p><b>Administration and interpretation issues?</b></p> <ul style="list-style-type: none"> <li>- Needs to be administered by a person familiar with administration and interpretation of neuropsychological tests</li> <li>- Caution not to interpret peripheral problems as CNS deficits</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Performance on tests that require novel, hands on learning</li> </ul> <p><b>How to design a simulation in this area from scratch (e.g., role play); What to include?</b></p> <ul style="list-style-type: none"> <li>- Typing tests</li> <li>- Tutorials for typing, data entry, 10 key</li> <li>- Tests that involve repetitive or rapid fine motor skills like putting together parts of a bicycle assembly</li> <li>- Simulations that replicate bench work or light industrial work</li> </ul> <p><b>How to modify an existing procedure (e.g., work eval) to include information on this domain?</b></p> <ul style="list-style-type: none"> <li>- Have the client perform the task over an extended period of time and/or for several days. Look for an improvement or lack of.</li> </ul>



## SOCIAL-INTERPERSONAL

Existing Information	Interview	Incidental Observation	Questionnaires	Testing	Simulations and Naturalistic Observations
<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Previous diagnosis of a mental health or personality disorder</li> <li>- Placement in a class or program for students with emotional problems</li> <li>- Psychiatric hospitalizations</li> <li>- Suicide attempt(s)</li> <li>- School suspensions or expulsion</li> <li>- Unsuccessful termination in programs due to noncompliance or disruptive behavior</li> <li>- Incarceration or probation</li> <li>- History of frequent job loss or dispute with supervisors</li> <li>- History of drug or alcohol problems</li> <li>- History of violent behavior</li> </ul> <p><b>Where to look? (referral, medical, school/training, work, testing, volunteer, recreation, etc.)</b></p> <ul style="list-style-type: none"> <li>- Medical records</li> <li>- School records</li> <li>- Mental health records</li> <li>- Previous testing</li> <li>- Previous rehabilitation records</li> <li>- Vocational training records</li> <li>- Employer records</li> <li>- Criminal or probation records</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Rapid changes in mood</li> <li>- Low frustration tolerance</li> <li>- Lack of emotion, depressed mood</li> <li>- Limited social skills</li> <li>- Few friends</li> <li>- Inappropriate behavior (laughter, volume, disinhibition)</li> <li>- Sleep or appetite disturbance</li> <li>- Client describes a pattern of intense or destructive relationships</li> <li>- Client tends to blame others for past problems</li> <li>- Client endorses psychiatric symptoms</li> <li>- Client describes a chaotic or overwhelming life situation</li> </ul> <p><b>How to get the information?</b></p> <ul style="list-style-type: none"> <li>- Interview with client and significant other</li> <li>- Ask the client to describe a critical employment incident from the past</li> <li>- Interview a past employer or a teacher</li> </ul>	<p><b>What are you looking to observe?</b></p> <ul style="list-style-type: none"> <li>- Mood, affect</li> <li>- Social skills</li> <li>- Non-verbal behavior</li> <li>- Ability to cope with frustration and novel problem solving</li> <li>- Ability to cope with changes in scheduling</li> <li>- Initiating discussions about problems rather than acting them out</li> <li>- Occasions when a client will attempt to engage staff in a dispute among themselves on the behalf of the client</li> </ul> <p><b>Where and when are these behaviors observed?</b></p> <ul style="list-style-type: none"> <li>- In the waiting room</li> <li>- During the assessment</li> <li>- In a training program or employment setting</li> <li>- At home</li> <li>- During interactions with other professionals or office staff</li> <li>- In the community</li> </ul> <ul style="list-style-type: none"> <li>- During the course of applying for services</li> <li>- When services are being delivered or explained</li> </ul>	<p><b>What questionnaires?</b></p> <ul style="list-style-type: none"> <li>- Beck Depression Inventory</li> <li>- PAF and RAF</li> <li>- PCRS and Relative PCRS</li> <li>- PPC</li> </ul> <p><b>Which items?</b></p> <ul style="list-style-type: none"> <li>- Items that address a client's ability to cope with stress</li> <li>- Items that assess current stressors or problems</li> </ul> <p><b>How administered?</b></p> <ul style="list-style-type: none"> <li>- By VR counselor</li> <li>- By mental health professionals</li> <li>- By voc eval staff</li> </ul> <p><b>To whom?</b></p> <ul style="list-style-type: none"> <li>- Client</li> <li>- Significant others</li> </ul>	<p><b>Which tests?</b></p> <p>MMPI TAT Rorschach</p> <p><b>Administration and interpretation issues?</b></p> <ul style="list-style-type: none"> <li>- Needs to be administered by a qualified professional</li> <li>- Scoring is complex, although computer scoring is available</li> <li>- Should be administered by someone with training and experience</li> </ul> <ul style="list-style-type: none"> <li>- Client may not be able to read or understand some of the items, making the test invalid</li> <li>- Client may try to "look good" or "look bad", which would invalidate the test</li> </ul>	<p><b>What to look for?</b></p> <ul style="list-style-type: none"> <li>- Social skills</li> <li>- Non-verbal behavior</li> <li>- Ability to cope with frustration and novel problem solving</li> <li>- Ability to cope with changes in scheduling</li> <li>- Initiating discussions about problems rather than acting them out</li> <li>- Occasions when a client will attempt to engage staff in a dispute among themselves on the behalf of the client</li> </ul> <p><b>How to design a simulation in this area from scratch (e.g., role play); What to include?</b></p> <ul style="list-style-type: none"> <li>- Situations where the client gets positive and negative feedback about performance</li> <li>- Situations where the client receives negative feedback unfairly</li> <li>- Client is put in a position of authority over others</li> <li>- Job requires the client to work cooperatively with one of more clients to get the job done</li> </ul> <p><b>How to modify an existing procedure (e.g., work eval) to include information on this domain?</b></p> <ul style="list-style-type: none"> <li>- Include opportunities to interact with supervisors and co-workers</li> <li>- Include opportunities for problem solving and group interaction</li> </ul>

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## ***SECTION 3: The Functional Assessment Process***

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### **Developing Appropriate Referrals**

#### **Determining the Need for Assessment**

Functional assessment is a time consuming and labor intensive process. It is also extremely effective. For many individuals, it is time well spent. Therefore, it is helpful to consider some guidelines in choosing candidates for functional assessment. Below is a list of criteria that have been helpful in identifying the individuals who might benefit the most from functional assessment. Functional assessment has been particularly helpful when the individual meets the following description of cognitive disability as a primary presenting problem:

- Individual has a cognitive disability, represented by everyday problems in some area of cognition such as memory, language skills, visual-spatial skills, planning/organization, etc.; or cognition varies from day to day, or includes problem in multiple areas as listed above;
- Problems result from acquired brain injury (head injury, stroke, tumors, seizure disorders, etc.), specific learning disabilities, or cognitive change associated with some chronic medical condition such as multiple sclerosis, cerebral palsy, etc.

AND additionally meets more than one of the following criteria:

- Completed traditional psychological or neuropsychological assessments, but the results were unclear, conflicting or not useful for rehabilitation planning purposes;
- A long history of vocational rehabilitation services, but little progress in setting and pursuing a vocational goal;
- Unrealistic vocational goals;
- Difficulty in developing insight into and describing own strengths and weaknesses;
- Inability to generate vocational goals even with extended support;
- No active substance abuse, family crisis, acute psychiatric symptoms or medical problems, or other immediate concerns that will impede personal growth;
- Extensive involvement with service providers and/or complicated history that has not been integrated into one report or

rehabilitation plan;

- Continued commitment to employment.

### ***Who Doesn't Need Functional Assessment:***

Many clients going through the vocational rehabilitation process will require some services of psychologists, but will NOT need or benefit from a functional assessment. In these cases, both the counselor's limited financial resources and the individual's time and tolerance for testing can be conserved. Guidelines for NOT referring for a functional assessment of cognitive disability include occasions when:

- Individual expresses ambivalence about employment or has significant negative incentives to employment (ongoing litigation, adequate non-work income);
- Unresolved or untreated psychiatric symptoms are dominant (e.g., severe depression, hallucinations, psychosis, mania);
- Acute distress such as grief, acute/temporary injuries or illness is present;
- Referral questions are diagnostic and defined by neuropsychological testing or a psychological interview; e.g., does this individual meet criteria for a disability;
- Individual's time is so committed to current education, employment or caretaking as to be unavailable for extended evaluation.

In addition to following these guidelines for selection of functional assessment candidates, several steps can be taken to develop referrals that will be the most productive. It is of key importance that consensus is established among all parties involved in the assessment.

### **Identifying the Provider**

Functional assessment is a process that can be undertaken by a variety of individuals. Rehabilitation counselors, school counselors, teachers, and rehabilitation service providers can complete many functional assessment procedures independently. Each of these procedures can add valuable information when rehabilitation, education or vocational plans are being developed. Other, more specialized procedures such as neuropsychological assessment must be provided by a qualified specialist with relevant experience. Reports from these specialized providers can be incorporated with other functional assessment information from other sources. Suggestions are made in Section 5 (page 71) for ways in which a functional assessment can be undertaken by a variety of service providers in the community, or by a vocational rehabilitation counselor.

## **Collecting and Utilizing Existing Information**

The review of background records is an essential part of the functional assessment process. Comprehensive records should be gathered by the VR counselor, and reviewed in detail by the psychologist or other service provider, or they can be requested by the provider directly.

Records not available through the VR counselor will need to be gathered by the provider conducting the functional assessment. Some may be held in the records of the individual or the family. For all record transmission and verbal discussion with information sources, written, informed release needs to be obtained from the individual before approaching the source. Typically this is most easily accomplished in a pre-assessment staffing, but may also be facilitated by the VR counselor meeting with the individual before the functional assessment process actually begins.

### **Relevant records include:**

#### ***Medical Records:***

Particular attention needs to be given to any medical history which may effect the individual's physical capacity to work (injury, chronic illness) or cognitive capacity (head injuries, neurological diseases, medications). Birth and developmental records should be reviewed.

#### ***Mental Health Records:***

Review these records, noting information about the cyclic nature of any symptoms, the effects of medication, and the impact of any mental health issues on daily activities. Note any problems with substance abuse or interpersonal skills, as these areas are directly related to job performance.

#### ***School/Training Records:***

Review transcripts from all schools and training programs the individual has attended. These records may also contain information from standardized IQ and achievement tests. For individuals who have been involved in school or training recently, interview key informants by phone or in person (with the individual's written consent). These informants include anyone in the school or training setting who had a good knowledge of the individual and their school experience. This might be a school counselor, resource room teacher, advisor, etc.

***Developmental and Social History:***

Solicit a developmental/social history from the individual or an informant they designate, such as a parent. Seek information about the individual's birth history, developmental milestones, family history, social contacts and supports. When possible, request the individual to provide as much information as possible, and then compare this information to the informant's information. Explore any discrepancies in the information, especially as this may reflect on the individual's insight, or on personal versus familial concepts of disability status, disability etiology, and its impact.

***Employment History:***

Gather information directly from the individual on job history. Contact both current and previous employers or supervisors (with the individual's permission). They can provide invaluable information about the individual's performance on the job and possible accommodations.

# Pre-Assessment Dialogue

In addition to following the guideline for selection of functional assessment candidates, several steps can be taken to develop referrals that will be the most productive. This can occur at a pre-assessment staffing in which all individuals involved with the functional assessment meet, or through a series of contacts made by the assessment provider with the various participants. The goals of this pre-assessment dialogue are to develop specific and relevant referral questions and to obtain informed consent from the participant.

## Formal Pre-Assessment Staffings

Once a referral has been made and at least preliminary background records have been gathered, a pre-assessment staffing can be scheduled. This meeting includes the individual who is considering the assessment, any significant others the individual chooses, the VR counselor and the functional assessment provider. If possible the pre-assessment staffing takes place at the site where the assessment will be completed to allow the individual to be exposed to the setting and have some experience in finding it.

A major goal of the pre-assessment staffing is to allow the individual to make an informed consent concerning participation in the assessment. In order to do this, there needs to be consensus among all parties concerning the purpose of the evaluation and the specific referral questions. The individual always remains at the center of this discussion and is in no way to be an observer. Staff ask the individual about understanding of the assessment purpose and procedures. If the individual does not have a clear understanding, the information is provided more clearly and concisely. The information about the assessment is provided in a format that the individual can understand and take with them for future review. Questions are encouraged from both the individual and the VR counselor.

The individual is asked about history and vocational goals. This preliminary discussion can serve as the basis for some of the assessment activities, and this connection should be made clear to the individual. If there is consensus among all involved concerning the nature and purpose of the assessment and the individual is in agreement, a starting date for the assessment can be arranged. Otherwise, it is best to encourage all parties to think about the information provided over a few days time and ask additional questions as needed. The individual is assured that the assessment depends on his or her investment of time and effort, and will only be scheduled with full consent. From this early contact the individual understands that they need to be an active participant in the assessment, and that it is designed for self discovery.

## Conceptualizing and Framing the Referral Question

Referral questions need to be quite specific and detailed, and need to be agreed on by everyone involved in the assessment. The utility of the assessment is directly related to the relevance of the referral questions. In general, referral questions should specify any vocational

goals under consideration. Below are samples of initial referral questions and the same referral questions developed for effective functional assessment.

Please evaluate for learning problems.

- or -

Is this individual likely to be able to complete a four year business degree after finishing her associate's degree?

What is a reasonable vocational direction for this individual?

- or -

In light of the individual's interest in fishing and hunting, is employment as a game warden feasible?

What is the individual's best learning style?

- or -

What accommodations should be made in a nurse's assistant training program?

Refinement and specification of the referral question can occur as the result of direct collaboration among the individual, counselor and provider. This can readily be handled in the pre-assessment staffing.

### **Obtaining Informed Consent and Preparing the Individual for Assessment**

Before beginning the assessment, discuss what is involved in a functional assessment, and what the outcome might be. Typically, the counselor might discuss a potential case informally with the functional assessment provider to help determine if functional assessment is a reasonable option. In some cases the provider may suggest other options.

The counselor needs to discuss the assessment with the individual, being clear about what is involved, the potential benefits, and the need for commitment to the process. Providing the individual with something to read about the assessment process (in clear, simple text) and giving him or her some time to think about it will create an increased sense of "informed choice." This may be an informational brochure developed by the VR office, the service provider, or ideally as a cooperative effort.

In some cases it is helpful to authorize the individual to meet briefly with the provider before making a final decision about involvement. This interview will give the provider a better idea about the individual's potential to benefit from functional assessment. It will also give the individual the opportunity to develop a better sense of the assessment. The provider should then give feedback to the counselor about the interview with recommendations for the next step.

# Functional Interviewing

A functional interview is an extension of the information gathering process that starts with collecting background information. The functional interview differs from the traditional clinical interview in its emphasis on the individual's current environment and relationships between that environment and current problems. It also differs in its emphasis on exploring the interface between cognitive strengths and limitations and everyday life. Its purpose is not to provide a historical view of social, vocational, educational, medical, or familial background. In order to conduct an interview that elicits truly functional information, it is critical to keep these two agendas separate. Participants in the interview may be able to become more involved when this overall objective of the functional interview is communicated explicitly to them before beginning.

## Goals of the Functional Interview

A functional interview should serve several purposes:

- 1) To elicit the individual's own version of his or her history, touching on all of the areas of potential importance. Areas of discrepancy need to be explored.
- 2) To determine the individual's view of the problems or obstacles they are encountering in their daily activities. The nature and cause of the problems, as the individual sees them, should be explored, as well as any strategies and accommodations he or she finds effective in dealing with these obstacles.
- 3) To insure that the individual's goals for the assessment are made explicit and can be addressed through the process. The individual should be able to state the referral question. Often the individual may have difficulty holding onto the information from the pre-assessment staffing. During the functional interview the individual is provided another chance to review his or her goals, and address any discrepancies.
- 4) To engage the individual as an equal partner in the assessment process, and help them to see the assessment as an opportunity for self discovery.
- 5) To identify the individual's vocational goals which will be addressed throughout the assessment process.
- 6) To identify any discrepancies between the individual's perception of his or her problems and his or her behaviors, history or the report of observers.
- 7) To provide a model of interaction that values both the individual and their everyday success and failures over diagnosis, formal testing, or past opinions of other authority figures.



## **Specific Outcomes from a Functional Interview**

If the goals above are kept in mind as the interview progresses, there will be several specific outcomes from a functional interview for both the interviewer and the participant. These include:

- Specific picture of daily life schedule and activities;
- Impact of problems on everyday life experiences;
- List of tentative personal and vocational goals;
- List of areas of conflict or disagreement between individual and other sources of information;
- Personal attributions of current circumstances;
- List of previously attempted remedies;
- Clarification of goals for the functional assessment;
- Commitment and understanding regarding individual's role in the functional assessment process.

## **Strategies for Successful Functional Interviewing**

When conducting a functional interview, information is usually available from multiple sources including the individual themselves, various records, current or previous testing, and family/friend reports. The type of information will either be presented as a deficit/diagnostic issue (memory problems, math learning disability), or as a description of everyday behavior or experience (class failure, too slow on the job). These two polar opposites both provide valuable material for an interview. A comprehensive functional interview will make use of both sources, as described below.

Presentation of deficits, impairments, or diagnoses should be followed with questions to explore the daily impact of these. In this strategy, the interview makes no assumptions about what understanding or meaning a diagnosis or stated deficit has for an individual. The role of the deficits are discussed in terms of the individual's environment and personal goals. In some cases, this results in recognition that there is little daily impact of a deficit, hence there is little need for analysis or intervention. This may also indicate that the individual has little insight into the daily ramifications of the deficit, and may therefore suggest that future efforts explore the deficits impact in greater detail. Alternatively, discussion of diagnoses and deficits may elucidate significant connections to performance in everyday life and provide direction for intervention.

The second strategy is to use presenting complaints about life competence or everyday problems and move in reverse, to the impairments behind the problems. Although the general issue of cognition is paramount in this discussion, such an approach makes no assumptions about the etiology of everyday competence. Issues in mental health, motivation, living circumstances, significant interpersonal relationships, financial status, and personal values may be sources of everyday problems that are presented or perceived as a result of cognitive problems.

By using both strategies in a functional interview, the individual is walked through a careful examination of what they know and believe about impairment and everyday competence. Daily life demands and possible obstacles to meeting these demands have been explored from several directions, so that the interactions between impairment and environment have become clearer for both the individual and the interviewer.

## **Ways to Question**

To help elicit and organize the information from the functional interview, the interviewer should be aware that direct questioning of functional abilities (e.g., Do you have any problems with planning and organization?) may not provide valid results for various reasons. Two tactics may be taken in the interview, and to some extent both should be used. The first is asking the question directly. For example, if you wanted to know about organizational skills, ask the individual if they have effective organizational abilities. You may have to give examples that pertain to their situation, like "Are you able to organize and prioritize the weekly assignments that you have for the four courses you are taking?". While it is important to obtain the perspective of the individual regarding their cognitive abilities and problems, the problems they experience may limit their ability to accurately understand and respond to the questions. The individual, because of a cognitive disability involving such areas as comprehension and expression, memory, or self-awareness, may not be able to accurately appraise and report on their abilities in response to direct questioning. The second tactic, therefore, involves questioning the individual about how they carry out certain activities in their life, and infer from this their cognitive abilities and limitations. For example, Table 10 (page 50) lists prompts for generating information from the interview on executive abilities.

## **Applications of Information Gathered**

The functional interview provides information that supports numerous issues during the functional assessment. Primary among them are diagnosis, responses to referral questions, development of rehabilitation plans, and career planning. Each is discussed below.

### ***Diagnosis:***

Data from the functional interview on everyday successes and failures is critical material to corroborate tentative diagnoses based on psychometric or historical findings. Because the functional interview focuses on the impact of deficits in the environment, specific examples and levels of disability can be provided as part of diagnosis to bolster diagnostic formulations.

### ***Referral Questions:***

Information garnered during the functional interview is used to provide specific responses to referral questions in the final report. Since referral issues often rest in determining how known deficits will impact training, employment, or personal goals, the interview will have sorted through these issues and provided a framework for responding to these questions.

### ***Rehabilitation Planning:***

The exploratory nature of the functional interview provides numerous opportunities to define the obstacles an individual faces in their environment and explore what resources exist to intervene. Subsequent rehabilitation planning, therefore, will define problems that the individual is concerned about, will recognize what has already been attempted, and will specify intervention plans that are known to be reasonable and workable given the individual's environment and resources.

***Career Planning:***

Functional interviews allow the individual and examiner to pursue feasibility of employment and various careers from multiple perspectives, and sets a tone of brainstorming that facilitates consideration of vocational directions from numerous perspectives. During a functional interview, the issues of disability ramifications, environment, and career directions are woven together in a way that contributes to understanding the impact of a disability on any particular career field.

**Table 10**  
**Examples of Interview Questions**  
**for Understanding Executive Abilities**

Do you grocery shop for yourself? If so, describe how you go about this.

Have you ever planned a party? If so, describe what you did. If not, what do you think would be important things to do in planning a party?

(If in school) Tell me how you organize your materials, assignments, and projects for school.

How did you find this place? What did you do to learn how to get here, and then to actually get here?

Tell me what you feel your strengths and weakness are, and why you feel they are either a strength or weakness?

What is the process you go through in opening, responding to, and filing (storing) your mail?

Where are the following things:

- the owner's card for your vehicle
- your birth certificate
- your social security card
- a roll of scotch tape or a stapler in your house
- the instruction manual for your VCR

What do you do to remember or store important telephone numbers that you might need on a day-to-day basis?

Describe the last significant (important, pressing) problem that you solved.

# Incidental Observations

Behavioral observations are also a vital component in the assessment. Careful notes are taken throughout the assessment process. It is particularly important to note how the individual responds to structured vs. unstructured time. Behavior on breaks and in the waiting room may be more relevant than behavior during standardized testing. Note how the individual responds to feedback, how he or she seeks assistance, and how behavior changes as the individual becomes more comfortable in the assessment setting. Special forms can be developed for behavioral observation, or staff members can include qualitative observations in their report of each activity. Do not overlook the need to document behavior *between* structured activities.

Careful observation of the individual to be assessed is a very powerful tool. Every opportunity should be taken to observe the individual's cognitive style in both formal and informal settings. Examples of situations in which relevant observations can be made include:

- Calling to set up or cancel an appointment, or failing to call;
- The way in which the individual gets to and from the appointment, including who accompanies them and how transportation was handled;
- Behavior in the waiting room, hallways or break areas, including interactions with others;
- Activities during meal breaks;
- Behavior during structured activity, including, work, classroom or testing activities.

During each of these activities, the evaluator has a chance to test out hypotheses concerning the individual's cognitive strengths and limitations. The goal is to watch for *patterns* of performance which suggest which cognitive domains may be contributing to obstacles in the individual's everyday activities.

## Hypothesis Testing

To draw accurate conclusions from the functional assessment requires careful review of standardized test data and hypothesis testing during the non standard assessments. In observing the individual, the evaluator will make some educated guesses as to which cognitive or behavioral domains present functional obstacles for the individual. Once a potential cognitive limitation has been identified, the evaluator needs to vary the task demands to "control" for that cognitive problem and determine the possible contribution of other cognitive skills.

For example, if the evaluator believes that the individual's receptive language is an obstacle, they will watch for a pattern of performance in a number of assessment settings. The evaluator needs to "control" for the potential receptive language problem by making sure that the individual

understands what is asked of him or her. Then the evaluator needs to check to see if, for example, attention or memory might also have an impact on the individual's performance.

Care should be taken not to overgeneralize or jump to conclusions about an individual's performance from just one activity. Everyone is likely to experience initial confusion during an unfamiliar activity. There is also the possibility of an "off day," when an individual's performance has been influenced by fatigue, stress or illness. The most accurate reflection of an individual's cognitive strengths and limitations will come in patterns of performance observed over time, in a variety of settings.

Below are some questions which can be used to guide observations during formal and informal activities.

- Did the individual attend to directions?
  - Did he/she attend after cuing?
  - Did he/she attend initially, then fade?
  
- Were the directions understood?
  - Could he/she explain the task back clearly?
  - Was he/she able to demonstrate the task?
  
- If the directions were not understood initially, what if anything, made the directions more clear?
  - Repetition?
  - Simplifying the language?
  - Breaking directions down into smaller pieces?
  - Providing direction in writing?
  - Using pictures, graphics or diagrams?
  - Demonstrating the directions?
  
- Was the task begun independently, or was a cue needed to initiate?
  
- Was the task begun prematurely, or impulsively, before directions were completed and understood?
  
- After beginning, how long was he/she able to stay on task before requiring redirection?
  
- Why was redirection necessary?
  - Distraction by another activity?
  - Self-distraction?
  - Loss of interest or motivation?
  - Confusion about how to proceed?
  - Forgetting the instructions?

- Was he/she able to generalize the instructions to a new situation?
- Was he/she able to seek additional information that was needed?
- Was he/she able to problem solve when confronted with uncertainty?
- Was he/she able to persist with the task until completion?
- Was the task completed in a timely fashion?
- Was the task completed accurately?
- Did he/she spontaneously use any accommodations or strategies to help themselves?
- Was he/she able to detect his/her own errors?
- Was he/she able to correct his/her own errors?
- Could he/she correct errors with feedback?
- Was his/her overall rating of own performance accurate?
- Was he/she able to identify what contributed to his/her difficulty if any?
- Could he/she identify any strategies or approaches that would help?
- How was the task completed on repetition?

# Psychological, Psychoeducational and Neuropsychological Assessment

Sound vocational rehabilitation with individuals with cognitive disabilities requires that psychological and neuropsychological assessment be an integral part of an assessment □ rehabilitation continuum. Psychological assessment should build upon information that has been gained from review of existing records, history, and interview. Likewise, results of psychological assessment should shape further assessment of functional abilities and needs. Psychological assessment should not be thought of as an independent, isolated service upon which definitive goals or directions are based. It should be seen as a useful, often necessary tool for exploration of individual abilities, challenges and needs.

## Testing Approaches

Testing approaches can be roughly described as: *psychological evaluations* which involve an individualized measure of intelligence and personality, perhaps with screening of academic and "organic" functions; *psychoeducational evaluations* which involve individualized assessment of intelligence and an expanded assessment of academic skills; and *neuropsychological evaluation* which involves a comprehensive evaluation of brain functions using a standardized group of tests or subtests.

Depending upon the referral question, individuals with cognitive disabilities may receive any or all of these testing approaches. However, no established "battery" of tests sufficiently addresses all of the cognitive, behavioral, and emotional domains required to evaluate the individual with cognitive disabilities comprehensively. As a result, assessment must be accomplished by combining available instrumentation to cover required areas of functioning.

Neuropsychological approaches such as the Halstead-Reitan Neuropsychological Test Battery (Reitan & Wolfson, 1985) and the Luria-Nebraska Neuropsychological Battery (Golden, Hammeke & Purisch, 1980) have well documented psychometric properties with respect to assessing brain functions. These batteries, although distinctly different from one another, offer the benefit of obtaining standardized information on a wide variety of cognitive, language, sensory, and motor abilities. Both batteries have extensive validity documentation with respect to identification of *acquired brain injury*. With respect to *learning disabilities*, studies of adults in the vocational rehabilitation environment using both the Halstead-Reitan Battery (McCue, Shelly, & Goldstein, 1986; O'Donnell, Kurtz, & Ramanaiah, 1983) and the Luria-Nebraska Battery (Harvey & Wells, 1989; Lewis & Lorion, 1988; McCue, Shelly, Goldstein, & Katz-Garris, 1984) have demonstrated adequate discriminative validity in distinguishing individuals with learning disabilities from other disability groups and from non-disabled individuals (Lewis, Hutchens, & Garland, 1993; Lewis & Lorion, 1988; O'Donnell, Kurtz, & Ramanaiah, 1983; Selz & Reitan, 1979a, 1979b) and have yielded prototypic patterns of performance on the basis of which learning disabilities might be identified. In this fashion, the application of neuropsychological assessment to individuals with cognitive disabilities is expected to assist in the diagnostic and VR eligibility process.

With respect to assessing the various domains or content areas pertinent to cognitive disabilities, the fixed battery neuropsychological approaches such as the Halstead-Reitan and the Luria-Nebraska appear quite well suited for the task, when supplemented by additional measures of



intellectual functioning, achievement, and personality. Additionally, since neuropsychological batteries sample such a broad range of strengths and weaknesses, they lend themselves well to generating informed clinical judgements about how cognitive, behavioral, and emotional deficits present as functional limitations in the natural environment.

## **Identifying and Selecting the Appropriate Testing Approach**

The question as to when to obtain a psychological, psychoeducational, or neuropsychological assessment is frequently asked. While the answer is not often clear cut, several rules of thumb can be considered in making this decision.

### ***Obtain Psychological Assessment When:***

- ☐ You wish to screen for psychopathology or significant emotional limitations;
- ☐ You want to identify academic deficits and obtain a diagnosis of an academic skills based learning disability;
- ☐ You want to determine the individual's general level of intellectual ability, problem solving ability, and/or learning capacity;
- ☐ To obtain a very rough screening of cognitive skills.

### ***Obtain Neuropsychological Assessment When:***

- ☐ The individual presents with an acquired brain injury (TBI, stroke, brain tumor, etc.);
- ☐ The individual presents with an atypical learning disability manifesting in perceptual, executive, language or other non-academic problems;
- ☐ You require further explanation of psychological test results;
- ☐ You require an explanation for vocational and life failures that may be attributed to cognitive problems;
- ☐ You wish to examine specific problem areas (e.g., memory);
- ☐ The client requires a cognitive capacities evaluation;
- ☐ Recommendations for treatment or intervention with cognitive limitations are needed;
- ☐ A diagnosis of an organic mental disorder is needed, or a differential diagnosis of psychiatric versus organic problems is required.

Regarding the timing of psychological assessments, evaluations are typically considered

timely if conducted within a 12 month period. If there is no reason to suspect that cognitive changes have occurred (rule out medical or psychiatric changes, presence of a progressive disorder, or the presence of significant life events such as loss of significant other or dramatic change in role or living situation), assessments greater than one year but generally less than three years old should be considered relevant. Consider reevaluation if circumstances such as those noted above exist, or if the assessment is greater than three years old.

## **Limitations of Standard Assessments**

The most frequently used means for assessing persons with cognitive disabilities is standard psychological and neuropsychological testing. Psychological tests measure abstract concepts such as intellectual capacity or personality. Neuropsychological tests were developed to determine the presence or absence of brain damage. They assess specific cognitive skills such as verbal memory or divided attention. Both types of tests are frequently utilized for the vocational rehabilitation purposes of diagnosis/eligibility and rehabilitation planning. Unfortunately, for rehabilitation purposes, most traditional psychological and neuropsychological tests were not developed to predict functional behavior in the natural environment.

Traditional approaches to assessment of this population (e.g., neuropsychological assessment) are effective in identifying the broad range of manifestations which may result from cognitive disabilities but are not effective in detailing how these might interact with task and environmental demands to impact the individuals functioning in real life situations (Cicerone & Tupper, 1990). In fact, results of psychological assessment procedures can be quite misrepresentative of an individual's actual functional level. An individual may function far above or far below levels suggested by psychological test results (Naugle & Chelune, 1990). As a result, there is a clear need for vocational rehabilitation assessments to go beyond standard approaches such as neuropsychological tests and identify functional obstacles to goal attainment, residual job skills, and the specific conditions under which these skills can be utilized (McCue, 1993). In order to assess the impact of cognitive disability on functioning and effectively develop a plan to overcome obstacles to employment outcome with individuals with learning disabilities, procedures which address the impact of cognitive disability on everyday functioning must be implemented. The impact of problems in inattention, memory difficulties, language problems, reasoning problems, executive dysfunction, and perceptual and motor deficiencies result in significant challenges to everyday problem solving.

It is difficult to identify the potential vocational impact of cognitive strengths and weaknesses identified through these more standard assessments, since the demands of the work site are rarely assessed and integrated into the interpretation of test findings. As a result, it is difficult to plan effective rehabilitation strategies when the obstacles to be addressed are not clearly delineated.

## Functional Use of Psychological Tests

### *Review of Ecological Validity*

While not developed for this purpose, psychological and neuropsychological test results provide valuable preliminary information regarding functional abilities and limitations. The *ecological validity* of tests refers to the capacity to provide accurate and reliable information regarding an individual's ability to function in the natural environment. Mixed results are reported in the literature regarding the ecological validity of neuropsychological measures. At best, test data provide only very general information regarding an individual's functional abilities outside of the testing situation. Following is a brief review of that literature.

There is evidence that a significant relationship exists between results of neuropsychological assessment and vocational functioning in neuropsychiatrically disabled individuals. Heaton, Chelune, and Lehman (1978) found that in a sample of 381 subjects with mixed neuropsychiatric diagnoses, a comprehensive neuropsychological evaluation comprised of measures of adaptive ability and personality which is commonly used in neurological and psychiatric diagnosis (Halstead-Reitan Battery) was able to discriminate between vocationally successful and unsuccessful (employed vs. unemployed) subjects. Newman, Heaton, and Lehman (1978) followed up 78 patients with mixed neurological disorders (including head injuries, stroke, epilepsy, anoxia, slow-growing tumors, and poisoning) to determine vocational status six months after neuropsychological evaluation. Significant relationships between performance on the neuropsychological tests and chronic unemployment, wage income, and indices of cognitive and perceptual work requirements were reported. A number of other studies have also demonstrated a strong relationship between neuropsychological tests and vocational outcome in persons with epilepsy (Dennerll, Rodin, Gonzalez, Schwartz, & Lin, 1966; Dikmen & Morgan, 1980; Schwartz, Dennerll, & Lin, 1968). In a study of 30 male medical and psychiatric patients, Morris, Ryan, & Peterson (1982) reported that performance on selected neuropsychological tests (Halstead Category Test, Trailmaking Test, and the Average Impairment Rating of Halstead-Reitan Battery) was able to classify patient success or failure on work samples with hit rates which ranged from 67-77 percent correct. Studies which involve neuropsychological methods in relation to vocational outcome provide reasonable justification for the clinical use of these tests as a component of the assessment process in the vocational rehabilitation of cognitive disability.

There also exists a modest literature on the prediction of functional outcome in individuals with various neurological disorders. Acker (1986) reviewed ten studies which support a predictive relationship between neuropsychological measures and rehabilitation outcome. Of these, Mackworth, Mackworth, & Cope (1982) found that neuropsychological tests of complex verbal and motor coordination functions were most predictive of impairment in vocational and independent living outcome in persons who survived head injuries. Acker (1982) reported significant correlations between scores on a battery of neuropsychological tests and outcome status as well as level of functioning in the community. DeTurk (1975) found that a summary score made up from a battery of neuropsychological measures was significantly correlated with outcome in self-care, social interaction, community and vocational responsibilities ( $r=.76$ ;  $p > .001$ ).

Several other studies found significant relationships between neuropsychological test scores and specific outcomes such as fiscal management (Wang & Ennis, 1985) and functional praxis (Baum & Hall, 1981; Lorenze & Concro, 1962; and Williams, 1967).

Ben-Yishay, Gerstman, Diller, and Haas (1970), utilizing multiple regression methods,

obtained a .9 level multiple R for the relationship between their predictors and outcome measures: self-care, ambulation, and length of in-hospital stay. The authors concluded that the use of multiple psychometric tests far outweighed the contribution of clinical and demographic variables. Weintraub, Baratz, and Mesulam (1982) attempted to form associations between cognitive tasks (subtests of the WAIS, the Mattis Dementia Rating Scale and clock drawing) and a Record of Independent Living devised by the authors. They categorized ADL problems into initiation, memory, and visuopractic skill components, finding that patterns of cognitive impairment paralleled patterns of ADL difficulties.

In a study of elderly hospitalized patients with either dementia, depression or mixed neurological conditions, neuropsychological assessment was found to be a valid predictor of those activities of daily living that have a strong cognitive component (McCue, Rogers, & Goldstein, 1990). The significant predictive relationship between specific neuropsychological skill measures and the ability to perform higher level, cognitive based daily living functions support the potential utility of neuropsychological tests for prediction of specific vocational outcomes.

### ***Functional Applications of Psychological and Neuropsychological Tests***

The application of functionally based neuropsychological assessment may occur across all aspects of the vocational rehabilitation process, although its impact is most pronounced in the initial assessment, eligibility, and rehabilitation planning stages. The initial identification of functional deficits (and assets assessed functionally) contributes to the ability to identify the presence of a disability, as well as document the handicapping effects of that disability.

With respect to planning, functionally based neuropsychological assessment may yield information on such topics as identification of a rehabilitation goal, delineation of remedial or rehabilitative strategies that are required and the degree to which these are required for a particular objective, compensatory and/or accommodation strategies which might be used in overcoming deficits, identification of areas in need of skill development (e.g., social skills), therapeutic or counseling needs, and specific vocational training or placement needs.

Clinical hypotheses or predictions about real world competencies posed on the basis of psychological and neuropsychological tests require knowledge and expertise in three areas:

- 1) A clear, clinical knowledge of the skills and abilities that are being measured, in this case, those behaviors which might be associated with cognitive disability. For example, in order to make predictions about how difficulties in executive functioning would interfere with vocational performance, one would have to have a thorough appreciation for the types, degree, and intensity of disorders of executive functions.
- 2) Technical expertise in the test procedures. Such expertise includes an appreciation for the range of behaviors required for adaptive or intact performance, and strong interpretive skills for addressing difficulties or performance failures.
- 3) An understanding of and appreciation for the demands of the situation or environment one is attempting to make predictions

about. As in functional assessment, the performance on standardized tests must be related to the demands of environment for it to be functionally relevant. For example, knowledge that, among other competencies, a clerical/receptionist job required a significant degree of auditory attention, moderately complex verbal comprehension and expression, and fine bimanual coordination would be essential in making a prediction about whether or not an individual could perform on that job.

Psychologists and neuropsychologists are typically well trained and experienced in points 1 and 2 above. However, in order to generate sound hypotheses about functional abilities from psychological and neuropsychological tests, the psychologist or neuropsychologist must either develop knowledge and expertise in evaluating the demands of the environment, or obtain this information in the referral and dialogue process. Without a clear sense of the outcome environment one must predict to, test scores are of limited use in contributing to our understanding of how an individual will function in the work or everyday living environments.

The prediction of real world behavior from standard assessment procedures (ecological validity) is tempered by several key issues which should be considered when designing or conducting community based functional assessments. Issues include:

- The need for specificity with respect to the environment in which the individual is expected to function;
- Similarly, prediction of real world behavior requires knowledge of the precise task demands to be made on the individual;
- The level and type of information processing requirements of the individual must be ascertained;
- What are the individual's compensatory abilities and how will these be used? Are accommodations and supports available?
- The need to examine premorbid factors or what the individual brings to the situation (e.g., past work experience, intellectual abilities, social skills);
- The need for broad based assessments to assure that all aspects of performance and potential assets and limitations are examined;
- The need for flexibility in assessment to test abilities and skills under a variety of conditions (e.g., testing the limits; using compensations or accommodations);
- The awareness that differences across age, extent, locus, and type of injury influence our ability to make predictions about functional abilities;
- The caution that decisions made about what individuals can and cannot do on the basis of psychological tests are not empirically supported. This has both legal and ethical ramifications, for

example, denying access to a training program based upon test results or making predictions about the extent of work disability in a personal injury case on the basis of test data alone;

- Because of the lack of conclusive ecological validity, there is a need for rehabilitation professionals to individually validate through successive, more ecologically valid assessments throughout the rehabilitation process with the individual, hypotheses about functional abilities and limitations derived through testing.

In summary, while acknowledging that most psychological and neuropsychological tests were not developed to predict behavior in the natural environment, and extensive validation does not exist for this purpose, there is increasing evidence to suggest that standardized measurement of cognitive and behavioral skills on psychological and neuropsychological tests are well correlated with performance in the daily living and work environments. Furthermore, the ability to make such predictions about real world behavior is enhanced when test data is combined with specific knowledge about the environment (and the demands which exist within that environment). Finally, when inferences are made about functional abilities from psychological tests, further testing of such inferences or working hypotheses is required throughout the vocational rehabilitation process. Such further testing of clinical hypotheses can be accomplished through functional assessment.

## **Rating Scales and Questionnaires**

Rating scales can be given to the individual and a variety of informants (with the individual's permission). Rating scales help respondents determine what is important to report and help them to organize and report their observations in a consistent fashion.

When a rating scale has parallel forms for the individual and an informant, discrepancies are readily apparent and can be explored. The scales are typically completed by the individual and a designated family member or friend. They can also be completed by a teacher or employer. Below is a brief list of rating scales and questionnaires. Also note that the LD Characteristics Checklist Dowdy (1992) has been revised as the Rating Scale of Functional Limitations and is included among the appendices.

Functional Assessment Inventory (FAI). Crewe, N.M., & Athelstan, G.T. (1984). Functional Assessment Inventory Manual. Menomonie, WI: University of Wisconsin-Stout.

LD Characteristics Checklist. Dowdy, C.A. (1992). Identification of characteristics of specific learning disabilities as a critical component of the vocational rehabilitation process. Journal of Rehabilitation, 58(3), 51-54.

Personal Problems Checklist (PPC). Psychological Assessment Resources, Inc. P.O. Box 998 Odessa, Florida 33556.

Patient Assessment of Own Functioning Inventory (PAF). Heaton, R.K., & Pendleton, M.G. (1981). Use of neuropsychological tests to predict adult patients' everyday functioning. Journal of Consulting and Clinical Psychology, 49(6), 807-

821.

Patient Competency Rating Scale (PCRS). Fordyce, D.J. (1983). Psychometric assessment of denial of illness in brain injured patients. Paper presented at the 91st Annual Convention of the American Psychological Association , Anaheim, CA.

Social Problem-Solving Inventory (SPSI). D'Zurilla, T.J. & Nezu, A.M. (1990). Development and preliminary evaluation of the Social Problem-Solving Inventory. Psychological Assessment: A Journal of Consultants and Clinical Psychology, 2, 156-163.

*The PCRS and the PAF also have "relative" forms (PCRS-R and RAF) for obtaining an independent evaluation of an individual's abilities.*

# Vocational Assessment and Exploration

A central emphasis of any functional assessment is the identification of reasonable vocational directions and possible obstacles to achieving those goals. In this section, the limitations of traditional vocational assessment tools and techniques are discussed, followed by specific recommendations for a model of vocational exploration that provides accommodations to assist in addressing the impact of cognitive disabilities on such a complex procedure.

## Limitations of Traditional Vocational Aptitude/Interest Testing

Frequently, neuropsychological batteries administered for vocational referral questions include a vocational interest inventory or a standardized vocational aptitude test. The psychologist incorporates results from these measures into the report along with neuropsychological data to suggest appropriate vocational directions for the client. Unfortunately, the vocational measures typically used neglect the specific needs of persons with cognitive disabilities, and do not result in recommendations that reflect realistic, functional directions for the individual. This occurs for several reasons. First, interest inventories identify broad classifications of interest; persons with cognitive difficulties may be unable to extrapolate from such a broad generalization to specific career areas, or may be unable, without guided assistance, to recognize what aspects of themselves are represented by the vocational interest area.

Second, vocational areas of interest may have been formed during previous, pre-disability work experience, and be entirely incongruent with current skills, abilities, and opportunities. It is difficult for persons with problems in memory and self-awareness to accurately respond to inventories based on their *current* status; they are more likely to respond based on previous abilities and successes, resulting in a profile that does not accurately represent themselves. Reports need to address any such conflicts, and provide realistic recommendations for career pursuit based on the coalition of interests and abilities.

Third, the majority of interest and ability tests are either completed by the individual working independently on a paper/pencil test, or on a computer-based inventory. The individual may not understand how to respond accurately unless staff persons are integrally involved in the administration to remind the individual to respond with current information, to clarify meanings of words, or to provide informal accommodations in the way of perceptual modification, organization of information to choose from, or reminders for options already presented. Persons with cognitive disabilities may be at a particular disadvantage if abstract or general concepts no longer conjure specific job examples, and may only be able to provide a valid test profile if a staff person assists with specific, concrete examples or in other ways engages the person interactively throughout the interest testing.

Fourth, aptitude testing focuses exclusively on "outcome" of specific tasks, and does not facilitate awareness or exploration of *why* individuals perform poorly. Additionally, the orientation of these tests toward speed, clerical skills, and physical stamina may entirely miss more complex but severely impairing changes in executive skills, longer term memory, social skills, etc. that frequently occur with cognitive disabilities.



The contribution made by standard administration of typical vocational interest and aptitude tests is significantly limited by the unique issues presented by cognitive disability. Even comprehensive reports that seek to integrate neuropsychological findings with vocational interests and abilities may be using inadequate or inaccurately derived data, resulting in rehabilitation plans that direct the individual and counselor toward vocations that will be unrewarding, unattainable, or frustrating.

### **An Alternative: Supported Vocational Exploration**

Many of the individuals referred for functional assessment may have limited work experience, experience only in areas unrelated to current vocational goals, or sustained changes in occupational capacity due to injury or illness. Some individuals may have never addressed the issue of vocational goal-setting. In these instances, it is important to conduct extensive vocational exploration. Suggestions for supported vocational exploration are provided below.

- If you use standardized interest or aptitude tests, choose an instrument which demands active participation on the part of the individual, and which provides feedback based on sound principles of vocational decision-making.
- Vocational interest inventories and aptitude tests should be combined with other activities to increase the individual's awareness of current interests and aptitudes.
- Transferable work skills should be elicited from the work history, hobbies, and leisure, civic, religious, or volunteer activities. They are recorded in a simple list that is shared with the individual.
- A thorough search using the computerized Dictionary of Occupational Titles, the Occupational Outlook Handbook, and the Guide to Occupational Exploration can be conducted with the individual. Specific information is secured about jobs which match interests and abilities, and particular job duties, environment, salary, and outlook is researched.
- Individualized vocational exploration activities should be set up as needed. These include informational interviews with employers, school programs or training facilities, job shadowing in which the individual spends time on the job with an individual working in a target position, and brief work experiences, paid or volunteer, in desired fields.
- The individual should also participate in more informal exploration activities such as identifying potential jobs through the newspaper, and reviewing listings of civil service positions.

- Ability to complete a job application, generate a letter of interest or inquiry, and participate in a mock job interview can be evaluated through simulations of these skills. This also serves to introduce the importance of these and other traditional "pre-vocational" skills.
- All findings should be summarized in a manner that is sensible to the individual. This will require some special supports, such as a simple list format, or a videotape or audiotape summary of the findings. It is especially important to record this information in a form that is accessible to the individual so that he or she can review it over time.

### **Accommodations in Vocational Assessment**

To make this vocational exploration useful to the individual with cognitive disabilities, special supports are provided. There may be a need to rephrase interview questions and assessment results in simpler language. The individual may need one-on-one support to complete any interest survey to assure complete understanding of all questions and respective validity of responses.

The individual's participation needs to be elicited throughout. There should be no "surprises"; all vocational directions must arrive from the input and participation of the individual. Any conclusions drawn from by examiners about potential vocational directions must be woven into the vocational assessment process so that the individual arrives at a similar conclusion themselves. All of these techniques are vital to ensure that the assessment really is an opportunity for learning and successful self discovery.

### **Informed Choice in Vocational Assessment**

Individual choice is critical to satisfaction with employment options and commitment to career directions. Informed choice can only be obtained through comprehensive, assisted vocational exploration. As described above, this process involves individual guidance, and addresses the ability of the individual to participate in the various tools used. As the process is very interactive, every effort is made to assure that the individual understands and comprehends all information being exchanged. *Accessibility of information is paramount in this process.*

### **Vocational Goal Setting**

Informed choice and disability awareness, together with information on current levels of functioning combine to provide support for establishment of individual-identified vocational goals. Education or training requirements are researched considering availability, financing, family situation, health, age, and other limitations or factors. When the goal is established, a plan for achieving the goal is subsequently developed, including identification of all necessary supports and services and possible providers of these services. Also developed are comprehensive, pragmatic recommendations for strategies and accommodations in the workplace.

# **Simulations, Situational Assessment and Observation in the Natural Environment**

Simulations are structured role plays of real life activities, such as a mock job interview. Situational assessments involve placing the individual in a real life situation which may be new to them such as a temporary job or completing some errands in the community. Observation in the natural environment involves the individual's own home, job, or educational setting which is familiar to them and in which they have developed their own routine.

Each of these assessment procedures can be used to evaluate how an individual might meet cognitive demands resolving real life problems. These activities require the individual to deal with multiple priorities, unforeseen circumstances and interpersonal interactions. Simple simulations or situational assessments can be developed to match the individual's needs and the conditions of the assessment environment. For example, situational assessments might be set up in the school cafeteria or graphics art studio, the hospital maintenance department, or the college bookstore. Below is a brief description of cognitive simulations which have been used in a pilot functional assessment project by the authors. These simulations can be readily adapted to other settings.

## **Clinic or Office Based**

### ***Job Search Simulation - Newspaper Task:***

The individual uses the Sunday newspaper to select three jobs that are of interest and reasonably matched to their skills. He or she then picks one of these jobs, writes a letter of interest to that job and turns it in to the evaluators.

### ***Interview Simulation:***

The individual is interviewed for the job that he or she designated from the newspaper. He or she is asked to approach this interview as if it were for a real job. The individual is asked to dress and act as they would for any job interview. The interview is conducted formally by a staff member with whom the individual is not familiar. The interview may be filmed and later reviewed with the individual to provide more precise feedback.

### ***Clerical Simulation:***

On this task, the individual performs a clerical task which involves organizing a large pile of cards containing catalog information. Cards of various colors are to be organized in different ways. For example, white cards are sorted alphabetically by name, while blue cards are sorted in alphanumeric order by invoice code. During the first hour, the individual receives three phone calls and is asked to take a message. He or she is asked to keep track of the time and after one hour, take a brief break to deliver the messages to a designated staff member. The individual is also asked to count the number of cards indexed and report it to the staff member as well.

### ***Academic Simulation:***

This task is used with persons whose goals are to attend college or a vocational training program. The individual watches a videotaped lecture, takes notes on the lecture itself, and completes a brief quiz about the information at the end of the hour. Individuals are also asked to read a chapter in a beginning college-level book, outline the chapter, write a one page summary of the main ideas presented, and take a brief quiz on the material.

## **Community Based**

### ***Route Finding/Job Search (State Office Building):***

The individual is asked to locate the state office building and the office to apply for state jobs. Maps, verbal or written directions are offered, but are not supplied unless the individual requests them. The individual is asked to bring back information on two jobs for which he or she might wish to apply. The individual is also asked to pick up an application form and bring it to the interview fully completed.

### ***American Adaptation of the Multiple Errands Test (AMET):***

The AMET (Aitken, Chase, McCue & Ratcliff, 1993; Shallice and Burgess, 1991) requires the individual to shop for a standard set of six items as quickly and cheaply as possible in a relatively small, contained shopping area, while obeying several rules. He or she must also mail a postcard to the evaluator containing information which can reasonably be obtained during the shopping trip and rendezvous with the evaluator at a specified place and time. The individual is not told how to acquire the information and some task requirements are only implied.

## **Situational Assessment**

Situational assessments are completed by putting the individual in a real life environment and observing how he or she functions over a period of time. These short term real life experiences can be arranged through temporary employment, often through the use of a temporary personnel agency. Volunteer work or short term employment arranged through family or friends can also be considered.

Situational assessments can be arranged to match the demands of training environments if the individual's vocational goals include training. Arrangements can be made for individuals to sit in on classes on a time limited basis. They can attend professional seminars or continuing education courses to assess their response to training at this level.

It is helpful for the individual to be placed in a situational assessment that is related to his or her vocational goal. The individual may have an easier time understanding how his or her performance in this setting will be related to performance in meeting his or her vocational goal. However, if this is not possible, situational assessment can still be a very valuable tool.

Cognitive endurance, ability to adjust to new demands, interactions with co-workers and supervisors, problems with transportation or break times can all be observed during a situational assessment, even in a field unrelated to the individual's expressed vocational goal. It may take some additional counseling and debriefing to help the individual see the relationship in these cases. Situational assessment may also provide an opportunity for the individual to try out a job that more closely matches his or her ability than the job identified as the vocational goal.

## **Observation in the Natural Environment**

The individual's ability to perform in his or her own environment may be markedly different than performance in other settings would predict, and should be assessed through direct observation. Observations can be completed at the individual's job site, in the classroom, or in the home, depending on the individual's level of functioning and the referral question to be addressed. In general, observations should be made in the context of cognitive domains, and should consider both areas of strength as well as those that pose difficulty. To make the best use of data from observations in the natural environment, the *process* an individual engages in to meet job demands must be noted and recorded. Issues such as timeliness, awareness of co-worker perceptions, communication style, intent of activity, and knowledge of employer expectations may provide more relevant data than traditional measurement of productivity or task outcome.

Brief questions or a short interview after observation are critical to evaluating what process the individual had attempted to use to arrive at the observed outcome. The presence of co-workers, student peers, or supervisory staff can be utilized to evaluate site standards of job performance and what processes others engage in to attain the same product. This provides a relevant and useful comparison sample to evaluate cognitive strengths and weaknesses; what may be considered a weakness may in fact be normative for the environment. Alternatively, cognitive strengths may not currently be tapped by worksite demands. Observation in the natural environment also provides an opportunity to observe the individual's spontaneous use of compensatory strategies or accommodations, as well as possible problem situations that might easily lend themselves to such.

Observation in natural environments is always at risk for confounding the individual's typical response or performance style. Every effort must be made to minimize this risk by making the individual comfortable and through non-obtrusive observation. Frequently, there will be opportunities for evaluators to participate in activities around the individual rather than merely observing. The evaluator may also request that the supervisor and the individual in assessment consider the evaluator to be "in training." The evaluator can then tag along, and the individual can always refer to the evaluator as a new trainee rather than disclosing the details of the evaluation.

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## ***SECTION 4: Assessment of Cognitive Demands in the Natural Environment***

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### **Cognitive Task Analysis**

In order to understand the impact of cognitive disability and the obstacles facing the individual, a functional assessment must identify the demands that will be placed on the individual in the environment. Although environmental demands or "task analysis" has long been used to describe the physical characteristics and demands of jobs, the functional assessment of persons with cognitive disabilities requires a parallel assessment of the task demands from a cognitive perspective.

A central idea in this activity is that the task or environment itself requires some level of ability in a specific cognitive area. It is not the individual that is initially assessed, but the cognitive demands of the task for any person to perform it. Once these demands have been established, the specific strengths and weaknesses of the individual in question can be compared to the task demands. The question in the back of the examiners head is not "what can this individual do," but rather, "what does this task require of anyone to complete it successfully." Because the activity here is specifically oriented to cognition, it is critical for the evaluator to have a good grasp of cognitive domains and how each is recognized in everyday environments.

In conducting such a cognitive task analysis, numerous factors contribute to the demands of the situation. Some of these are discussed below.

#### **Cognitive Domains Involved**

Identify which cognitive domains are critical to the activity under consideration. Be as specific as possible. For example, the work of a physician may initially be rated as "high" on executive functions. In many clinic settings, however, the physician's work requires a very high level of judgement and problem solving, but is very low in organizing and planning; most of the daily activities are actually prescribed for the physician by the environment.

#### **Level of Task Complexity**

For any specified domain, the demands may range dramatically over the level of complexity actually required. For example, attention to auditory input is critical to both receptionists and simultaneous translators, but is probably much more demanding and complex in the latter position.

#### **Language Processing Demands**

For receptive language, evaluate how complex a communication is likely to be (telephone numbers, familiar instructions, contract negotiation in a second language), and under what conditions will the communication be received (calm, noisy, hurried, spoken vs. written vs. typed, etc.)

#### **Degree of Task Structure**

At issue here is determining how much structure is provided by the task or the environment itself, versus the level of structure that must originate from the individual performing the task. This may be different for the same job title in different environments (a nurse conducting telephone interviews has been provided much more structure than a nurse doing home visits).

### **Degree of Environmental Support**

Consider what support and assistance are available for training, crisis assistance, or guidance in the natural environment. Describe the type, nature, and extent of support that currently exists, as well as opportunity or openness for either reducing or increasing support. Additionally, assess how support systems are accessed (provided without question, at employee request) and ramifications for using support (seen as interested, lacking confidence, a drain on the system).

### **Level of Task and Environmental Flexibility**

Explore via observation and direct questioning how much flexibility the system holds for completing tasks in non-traditional ways, and for implementing cognitive accommodations/workplace modifications. Check personnel policy standards for flexible hours, openness to disability status, and the overall approach of supervisory staff to difference in the workplace. In addition, consider whether the task mandates a specific procedure for successful completion, or if the task has multiple roads to a successful outcome.

### **Reinforcers**

Employment has multiple reinforcers available to encourage ongoing work efforts, but across environments, they differ significantly in type, match to the individual values, and recognizability. Evaluate environments for frequency of reinforcement (daily/frequent to never), types of reinforcement (wages, perquisites, social contact, verbal praise, altruistic satisfaction, feedback from task, intrinsic satisfaction), and how available these are to individuals (provided on regular basis, only upon request, contingent upon some behavior, etc.) Reinforcers may also differ in temporal value (short-term payoff versus long-term rewards), and in equity of distribution in the environment.

### **Academic Level Required**

Evaluate the environment for both specified and assumed levels of academic performance levels. Detail the quantity and level of reading material, frequency and type of written correspondence, and the presence of accommodations such as word processors or secretarial staff for dictation.

### **Interpersonal and Physical Demands**

Jobs vary significantly with respect to the amount and type of interpersonal demands placed on the individual. Evaluate the requirements for both formal and informal interpersonal demands. Evaluate value structures within the setting to identify any potential conflict with the individual. Also evaluate the array of physical demands of the environment, paying particular attention to elements that might have a negative impact on an individual's cognitive functioning (e.g., noise level).

## Cognitive Task Demand Scale

As a means of providing some structure to actually performing a cognitive task analysis, a survey form has been created (See Table 11, page 71). Although not comprehensive in detailing cognitive domains, the form outlines important areas to assess, particularly in the area of executive functioning. When using such a form, recall that the task/environment should be rated for anyone to perform the task. Only after this form has been completed, should an individual's assets and weaknesses be contrasted with environment demands.

## Using Existing Information Sources

The Dictionary of Occupational Titles (DOT) and the Occupational Outlook Handbook (OOH) provide many descriptions of tasks, jobs, and career fields. Although descriptions are oriented to physical and educational requirements, these are also excellent resources to begin a cognitive task analysis for a job. Note words used in the job descriptions to describe jobs at a non-physical level (judges, chooses, selects, interviews, evaluates, communicates, etc.) From these, consider what cognitive domains are taxed by the task, and at what level.

For greater specificity, an individual's prospective or current job description from the employer can provide important data for a cognitive task analysis. In both cases, it will be critical to share your observations about cognitive demands of the job with the functional assessment participant. Often, the task analysis can be done in conjunction with the individual, reviewing the DOT or job description with them, or interviewing them about specific tasks they currently perform.



**Table 11**  
**Cognitive Demand Analysis**

<b>Task/Job Title:</b> _____		<b>Date:</b> _____			
<b>Location:</b> _____		<b>Evaluator:</b> _____			
<b><u>Domains Involved</u></b>		<b><u>Level of Complexity</u></b>			
<b>Organization/Planning</b>		NA	L	M	H
<b>Problem Solving/Judgement</b>		NA	L	M	H
<b>Memory and Learning</b>		NA	L	M	H
<b>Attention/Concentration/Vigilance</b>		NA	L	M	H
<b>Perceptual/Motor Demands</b>					
Visual		NA	L	M	H
Auditory		NA	L	M	H
Tactual		NA	L	M	H
<b>Language Processing Demands</b>					
Oral Comprehension		NA	L	M	H
Written Comprehension		NA	L	M	H
Vocabulary		NA	L	M	H
Speed of Language Processing		NA	L	M	H
Oral Expression		NA	L	M	H
Written Expression		NA	L	M	H
<b>Social/Interactional Demands</b>			L	M	H
<b>Level of Structure Available</b>			L	M	H
<b>Level of Supervision Available</b>			L	M	H
<b>Level of Flexibility</b>			L	M	H
<b>Level of Self Evaluation Required</b>			L	M	H
<b>Level of Speed Required</b>			L	M	H
<b>Level of Accuracy Required</b>		L	M	H	
<b>Environmental Conditions:</b>					
<input type="checkbox"/> Noise	<input type="checkbox"/> Visual Array	<input type="checkbox"/> Heat	<input type="checkbox"/> Cold		
<input type="checkbox"/> Dust/Dirt	<input type="checkbox"/> Pollutants/Irritants	<input type="checkbox"/> Outdoors	<input type="checkbox"/> High/Dangerous		
<b>Other Comments, Please use reverse side</b>					

*Center for Applied Neuropsychology, Form CDA 5/94*

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## ***SECTION 5: Suggestions for Maximizing the Utility of the Assessment Process***

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### **Communicating the Assessment Results**

In functional assessment, the goals of observing individuals as they complete a simulation or a real life activity are to: 1) identify any obstacles which may effect the individual's vocational goal; 2) recognize functional limitations and their relation, if any, to the obstacles; and 3) to identify functional assets which may be a key to overcoming the obstacles. It is helpful to interpret performance on all assessments in terms of the relevant cognitive and behavioral domains discussed in Section 2. These include: executive functions, attention, memory and learning, communication, sensory/perceptual/spatial, motor, and social/emotional.

#### **Coming to Consensus**

The most important outcome from the functional assessment process should be agreement among the individual, the rehabilitation counselor and the evaluator on several issues. These include:

- Answers to Referral Questions
- Cognitive Strengths
- Cognitive Limitations
- Functional Obstacles
- Vocational Options
- Vocational Impact
- Recommended Strategies and Accommodations

Individuals can be involved in the process of consensus by using routine feedback sessions throughout the functional assessment procedures to elicit their input. They can use this time to take in information about their performance and skills and relate it to their vocational goals. A "product monitoring" approach, in which they can address the outcome of their work, as opposed to judging their own performance may be less threatening and allow for greater growth. Questions such as "Were you satisfied with the outcome of that task? Are there things that would help you if you did it again? Is that kind of task related to the work you want to do? Is there anyway to get around it? Are there any other options to consider?" can help the individual focus on productive change and information gathering.

It is important that the VR counselor be included in this process, and that they not have information or recommendations sprung on them during a post-assessment staffing. Frequent brief phone calls to keep the counselor informed of findings and possible recommendations allows the counselor's input to be incorporated throughout the assessment, if it is being completed by a service provider in the community.

### **Post-Assessment Staffing**

Following the assessment, a staff meeting which includes the individual, significant others as appropriate, the counselor and the assessment staff should be held. In this meeting a summary of findings should be presented as a review to information which has already been discussed with the individual and the counselor over the course of the evaluation. The answers to the referral questions should be explicitly discussed. A brief written summary or table of key findings and recommendations should be distributed to help make the information more accessible and to allow the individual to have something to review over time.

Formal agreement should be established during this meeting concerning changes in vocational goals and recommendations for accommodations or interventions. If new questions are raised, or new directions identified, the report which is finalized after the meeting can address these issues.

The individual should be asked to summarize his or her understanding of the assessment findings and recommendations so that clarification can be provided as needed. Time should be set aside to respond to questions from all participants.

### **Report Formats**

Reports should be laid out to address each of the topic areas listed above under "Coming to Consensus." Language should be clear and concise, and free of jargon. If technical terminology is used, it should be explained in the text. A sample report is included in Appendix 2. Note that each section is clearly labeled to make it easier to access information.

Test data are laid out in tables to minimize the use of complex, technical narrative. Tables of vocational impact are developed for each of the vocational goals that have been agreed upon through the assessment process. For each vocational impact, a rehabilitation strategy is recommended. A final note concerning report formats - the referral questions should be answered explicitly, so that there is no doubt about the outcome of the assessment.

## **Cultivating Vendors for Functional Assessment: Provider Managed Assessments**

A single service provider in the community, working closely with the VR counselor, may be able to manage the assessment process. In the pilot projects conducted by the authors of this handbook, the assessments were managed by rehabilitation psychologists. The standardized neuropsychological testing and all other aspects of the testing were completed by project staff or coordinated by the staff with other agencies in the community. Project staff was responsible for scheduling meetings with individuals and counselors, collecting all relevant data, and developing the final, comprehensive report. Other options include having the assessments managed by a vocational evaluator, or the staff of a rehabilitation facility or other community agency, or teachers and therapists in an educational setting.

Functional assessment providers need an in depth knowledge of the characteristics of various cognitive disabilities, the impact of cognitive disabilities on everyday activities, the domains of cognitive function and the methods for assessment of these domains. In some cases, no one provider will be able to complete all aspects of the evaluation. For example, the provider may be unable to complete a formal neuropsychological evaluation, or not have the resources to complete an assessment at a job site. In this case, one provider may still be contracted to manage the assessment, working with other providers in the community, possibly through authorizations or contracts from the VR agency. The agency responsible for managing the assessment coordinates all meetings and activities, gathers data from each of the other agencies involved, and generates a final comprehensive report. One staff member should work closely with the individual throughout each component of the assessment. This "assessment manager" should help the individual review outcomes in each segment of the assessment usually in cooperation with the staff who administered the assessment. Every effort should be made to help the individual apply this information to their everyday life and vocational options and to record this information in an accessible format.

To initiate these services in a community, the VR agency may wish to invite proposals from multiple community agencies. An initial workshop explaining the need and the anticipated scope of the service could be offered prior to the submission of proposals.

In some communities, it may not be practical to have the assessments managed by a service provider. The VR counselor can serve as the assessment manager in this case. The VR counselor can complete functional interviews with the individual and significant others, collect all relevant records, and interview informants. The VR counselor can authorize standard psychological assessments, and if indicated, may authorize work site assessments or assessments aimed at real life skills through community agencies. If this is not possible, the counselor could make arrangements to observe at the work site, the training site, or in other situations in the individual's natural environment.

The challenge is for the counselor to integrate information identifying the individual's functional strengths and weaknesses and determining the vocational impact. The counselor must also help the individual to understand and integrate the information. Some of these tasks may be difficult for counselors, especially if they have not had extensive experience working with individuals with cognitive disabilities. Other tasks are a very natural extension of the counselor's routine activities and training. With support and technical assistance that may be available from specialists working with persons with cognitive disabilities, VR counselors can become effective in conducting all facets of this assessment procedure.

# Shaping the Product

Several suggestions can be made for shaping a more useful assessment product. First, for any assessment, results will be significantly more relevant if specific referral questions are posed that relate to the individual's situation and future plans. General referrals have a likelihood of producing general assessment results. Another suggestion is to regularly provide feedback on reports of assessments to providers. The most effective way of providing feedback is positively reinforcing reports that were useful and functional. Assessment vendors often complain that they receive little or no feedback, even when solicited. Constructive feedback in the context of a collaborative professional relationship can be a very effective tool for developing more useful and practical assessments over time.

Establishing a mechanism to discuss test results with the psychologist or other provider is an excellent method for assuring that the results of the assessment are understood, and questions regarding the interpretation are addressed. In addition, this dialogue is an opportunity to shape future assessment products to better meet the vocational rehabilitation needs of the individual and counselor.

In considering what is really needed for functional assessment, it is easy to become overwhelmed at the idea of revamping the world of rehabilitation due to constraints on counselor time and resources. It is equally challenging to change the world of specialty assessments like neuropsychology, particularly when most readers fall somewhere outside of that world, as consumers of the reports rather than writers of them. All members of the rehabilitation community, however, *can* move toward more functional assessment. Some pragmatic suggestions for improving the effectiveness of functional assessment services that can be implemented include:

- 1) Identify a way of understanding the cognitive strengths and challenges of the individuals with whom you work, such as the model of cognitive domains like that listed in this handbook. Post a copy of it on your wall. When observing or thinking about an individual, consider what you know about them about each domain. Then think about what you know about the cognitive demands of their everyday life. How does it match up?
- 2) Don't neglect the importance of understanding the cognitive demands that will be placed on the individual. In order to understand the impact of a disability, abilities and limitations must be contrasted with task and environmental demands. Use resources such as job descriptions, Dictionary of Occupational Titles descriptions, discussions with supervisors or training instructors, and job analyses to detail the cognitive task demands that will be placed on the individual (e.g., the degree to which the worker must pay attention and respond to multiple sources of information simultaneously). Use a cognitive domains format similar to what you might use with an individual to organize information about the cognitive demands of a particular job or training program.
- 3) When you make your next referral for specialty psychological or neuropsychological assessment, identify the vocational directions

under question by the individual, and present referral questions that are directly relevant to the individual's life choices. For example, will his/her impaired memory get in the way on the job? Any way to get around that? What will the consumer's needs be for accommodation when returning to college? to a 2-year vocational training program? to a previous job?

- 4) Make sure the individuals to whom you provide services can understand test results and their areas of strengths in the context of their everyday life (understand the impact of their disability). Use vendors and providers to help you with this task, and also to make sure that you fully understand the functional impact of identified problems or "deficits" before attempting to devise a rehabilitation plan.
- 5) Ask individuals and their families/friends to talk about everyday activities □ who does laundry, shopping, planning of dinners, bills, and how do the tasks get done? Look for discrepancies between the individual and informants in responses, and follow up to determine reasons for differences.
- 6) Regularly ask individuals to evaluate their own performance in job interviews, on specific job tasks, and in daily living or rehabilitation related activities. Rather than focusing exclusively on facts (such as What did you tell them? What did they say?), elicit the individual's ideas on how they might do things differently, how others might describe their performance, and what things might be effective in improving their performance.
- 7) Change your language when working with individuals and providers. Focus on the demands they would anticipate in various jobs or environments, and discuss the specific obstacles that individuals face as they approach work and functional independence, rather than deficits and impairments. Discourage individuals from describing themselves in terms of personal deficits; substitute real-life characteristics instead.

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# ***APPENDIX 1: Glossary***

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<b>ABSTRACT THINKING:</b>	Ability to form concepts, use categories, generalize from single instances, apply procedures, rules and general principles, be aware of subtle or intrinsic aspects of a problem, be able to distinguish what is relevant, what is essential, and what is appropriate.
<b>ACALCULIA:</b>	Inability to perform simple arithmetical calculations; lesion located in left parietal lobe in the area of the angular gyrus.
<b>ACCOMMODATION:</b>	Restructuring of mental organizations so that new information may be processed and/or the reorganization of environmental factors which will facilitate functioning.
<b>AFFECT:</b>	A pattern of observable behaviors that is the expression of a subjectively experienced feeling state (emotion). Common examples of affect are euphoria, anger and sadness.
<b>AGE NORM:</b>	The average score on an aptitude or achievement test made by an individual of given chronological age.
<b>AGNOSIA:</b>	Denoting an absence of knowledge. Impairment of ability to recognize the symbolic meaning of material.
<b>AKINETIC MUTISM:</b>	Inability to speak, usually accompanied by a more general failure of ability to respond. It is frequently associated with lesions of the anterior brain stem.
<b>ALEXIA:</b>	Total impairment of reading ability.
<b>AMNESIA:</b>	The partial or total forgetting of past experiences, which can be associated with organic brain syndromes.
<b>ANHEDONIA:</b>	Diminished intensity of experienced pain and pleasure and the decreased responsiveness to negative and positive reinforcement.
<b>ANOMIA:</b>	Inability to name objects or recall and recognize names.
<b>ANOSOGNOSIA:</b>	Unawareness of neurologic or bodily deficits/conditions; confabulation or delusions may be present to explain.
<b>ANTERIOR:</b>	Situated in front of or in the forward part of an organ; toward the head end of the body; ventral or belly surface of the body; opposite of posterior.

**ANTEROGRADE**

<b>AMNESIA:</b>	Inability to remember events subsequent to the onset of amnesia.
<b>APHASIA:</b>	Impairment, due to cerebral damage, of the receptive or expressive abilities and use of language symbols for communicational purposes.
<b>APRAXIA:</b>	Inability, due to brain damage, to perform functional or purposeful acts.
<b>ASTEREOGNOSIS:</b>	A form of agnosia in which there is an inability to recognize objects or geometric forms by touch; thought to be caused by lesions in the central parietal lobe.
<b>ATAXIA:</b>	Disordered movements due to irregularity of muscular action and failure of muscular coordination.
<b>ATTENTIONAL DEFICITS:</b>	Distractibility or impaired ability for focused behavior; impaired concentration and mental/conceptual tracking abilities; may be modality specific.
<b>AUDITORY AGNOSIA:</b>	Impaired ability to recognize familiar sounds.
<b>AUDITORY APHASIA:</b>	A language impairment characterized by inability to understand spoken language.
<b>AUDITORY DISCRIMINATION:</b>	Ability to identify differences between sounds.
<b>AVM:</b>	An abnormal formation of arteries and veins. It may be only a small tangle of vessels or a large collection of abnormal vessels occupying a large area.
<b>BEHAVIORAL RATING SCALES:</b>	Scales which contain observational questions regarding orientation and behavioral functioning.
<b>BODY IMAGE:</b>	Awareness of one's own body and it's orientation, position, and movement in space and time.
<b>BRAIN STEM:</b>	The stem-like portion of the brain connecting the cerebral hemispheres with the spinal cord and comprising the pons, medulla oblongata, and mesencephalon.
<b>CEREBELLUM:</b>	The portion of the brain that lies behind the cerebrum and above the pons and fourth ventricle. The cerebellum is concerned particularly with coordination of voluntary movements.
<b>CEREBRAL TRAUMA:</b>	Brain injury as a result of some type of physical force, e.g., a concussion; traumatic brain injury.

<b>CEREBRUM:</b>	The main portion of the brain which occupies the upper portion of the cranium and consists principally of the two cerebral hemispheres which are united by large masses of tissue fibers (white matter) called the anterior commissure, the corpus callosum, and the posterior commissure. Some anatomists also include the anterior part of the brain stem.
<b>COGNITION:</b>	A general concept for any process where by an individual becomes aware of or obtains knowledge of an object.
<b>COMA:</b>	A prolonged state of unconsciousness.
<b>CONCUSSION:</b>	A condition of widespread paralysis of the functions of the brain which comes on as an immediate consequence of a blow to the head.
<b>CONFABULATION:</b>	A tendency to fill in memory gaps with invented stories.
<b>CONSTRUCTIONAL APRAXIA:</b>	Discontinuity between intent and outcome; totally based on accurate perceptions and actions; breakdown in the program of an activity that is central to the concept of apraxia, e.g., block design with head injured patients who cannot make the blocks do what they want them to do.
<b>CVA:</b>	Cerebral Vascular Accident; a stroke.
<b>DEMENTIA:</b>	Significant deterioration of intellectual and cognitive functions.
<b>DIPLOPIA:</b>	Double-vision
<b>DISINHIBITION:</b>	Lack of ability to restrain one's self from responding to distracting stimuli.
<b>DSM III-R:</b>	Diagnostic statistical manual, III-R; differential listing of psychiatric disorders.
<b>DYSARTHRIA:</b>	Imperfect articulation of speech due to disturbances of muscular control which results from damage to the central or peripheral nervous system.
<b>DYSFLUENCY:</b>	Difficulty in generating words; stuttering or stammering; not aphasia, apraxia, nor dysarthria; may include paraphasias and articulation errors.

<b>DYSGRAPHIA:</b>	Impairment in the ability to write; may be a part of a language disorder caused by a disturbance of the parietal lobe or of the motor system.
<b>DYSLEXIA:</b>	Impairment in the ability to read; often involves reversal of letters or words.
<b>EDEMA:</b>	Accumulation of abnormally large amounts of fluid in the intracellular tissue spaces of the body.
<b>ENCEPHALITIS:</b>	Inflammation or abscess of the central nervous system caused by infection from virus or bacteria.
<b>EUTHYMIC:</b>	Normal functioning of the thymus; used to describe normal mood state.
<b>EXECUTIVE FUNCTIONS:</b>	Goal formulation; planning; carrying out goal directed plans; effective performance; necessary for appropriate, socially responsible, and effective adult conduct; located in the frontal lobe particularly in the prefrontal regions in the orbital or medial structures; sensitive to damage to other parts of the brain such as subcortical lesions.
<b>EXTINCTION:</b>	Suppression of stimuli from one side of the body; may be polymodality or single modality neglect; most often caused by parietal lobe lesions.
<b>FINE MOTOR COORDINATION:</b>	Fine muscle control required to do precise movements, as in writing and drawing.
<b>FINGER AGNOSIA:</b>	Inability to identify fingers; may occur with lesions in either hemisphere.
<b>FOCAL LESION:</b>	A lesion of a small definite area.
<b>FRONTAL LOBE:</b>	One of the four lobes making up the cerebral cortex; responsible for planning, performance, and execution of all voluntary behavior.
<b>GENERALIZATION:</b>	The process by which an organism, conditioned to respond in a certain way to a particular stimulus, will also respond to similar stimuli in the same way.
<b>GESTALT:</b>	A term used to express any unified whole whose properties cannot be determined just by adding the parts and their relationships; more than the sum of it's parts.

<b>GLASGOW COMA SCALE:</b>	A scale used to access severity of initial cerebral damage and may predict potential outcome in cases of head injury.
<b>GROSS MOTOR SKILLS:</b>	Large muscle-dependent skills such as walking, running, and throwing.
<b>HEMIPARESIS:</b>	Partial paralysis or weakness of one side of the body.
<b>HEMIPLEGIA:</b>	Paralysis of half of the body.
<b>HYDROCEPHALUS:</b>	A condition characterized by abnormal accumulation of fluid in the cranial vault, accompanied by enlargement of the head, prominence of the forehead, atrophy of the brain, mental deterioration, and convulsions.
<b>IMPULSIVE:</b>	The tendency to act quickly without thinking.
<b>INFARCT:</b>	An area of dead or dying tissues (necrosis) resulting from an obstruction of the blood vessels normally supplying the area or part.
<b>INHIBITION:</b>	A checking or preventing of the expression of impulses or desires; thought to be controlled by the prefrontal area.
<b>INTELLIGENCE:</b>	Definitions of intelligence usually include three concepts: a) the ability to deal with abstractions, b) the ability to learn, c) the ability to cope with new or novel situations.
<b>INTELLIGENCE TEST:</b>	A psychological test designed to measure cognitive functions, such as reasoning, comprehension, and judgement.
<b>IQ - INTELLIGENCE QUOTIENT:</b>	Score derived from a standardized intelligence test which has a mean of 100 and a standard deviation of fifteen.
<b>KINESTHESIS:</b>	A sense by which muscular motion and degree of muscular contraction permits perception of weight, bodily position, etc.
<b>LABILITY:</b>	Emotional instability; a tendency to show alternating states of gaiety and somberness, or anger.

<b>LATERALITY:</b>	Specialization of one side of the brain for a particular function. Recent studies have shown that laterality of function can be affected by environmental factors as well as genetically determined factors such as gender and handedness; thus cerebral organization of some left-handers and females appears to have less functional asymmetry than that shown by males; laterality is relative and not absolute, because both hemispheres play a role in nearly every behavior.
<b>MALINGERING:</b>	Conscious or unconscious motivations may contribute to symptoms which resemble neurologic disorder, but may not actually be based in fact; secondary gain may exacerbate symptoms.
<b>MOOD:</b>	A pervasive and sustained emotion that, in the extreme, markedly colors the person's perception of the world. Common examples of mood include depression, elation, anger and anxiety.
<b>NEUROPSYCHOLOGY:</b>	A specialty within the field of psychology that focuses primarily on the relationship between brain function and behavior.
<b>OCCIPITAL LOBE:</b>	The most posterior lobe of each cerebral hemisphere.
<b>ORGANIC:</b>	Pertaining to the biological as opposed to the functional aspects of an organism.
<b>ORGANIC MENTAL DISORDER:</b>	Behavioral problems that are directly traceable to the destruction of brain tissue or to a chemical imbalance in the brain.
<b>ORIENTATION:</b>	The awareness of self in relation to one's surroundings; requires intact attention, perception, and memory abilities; sensitive to brain dysfunction.
<b>PARAPHASIA:</b>	The habitual introduction of incorrect and inappropriate words into speech.
<b>PARIETAL LOBE:</b>	One of the four lobes of each cerebral hemisphere that is bound by the frontal lobe anteriorly, the occipital lobe posteriorly, and the temporal lobe principally inferiorly.
<b>PATHOGNOMONIC SIGNS:</b>	Any sign or senses specifically distinctive or characteristic of a disease or pathological condition and on the appearance of which a diagnosis can be made.

<b>PERCENTILE RANK:</b>	A point (score) in a distribution below which fall the percent of cases indicated by the percentile. Thus, a score coinciding with the 84 percentile is regarded as equalling or surpassing that of 84 percent of the persons in the group, in such that 16 percent of the performances exceed this score.
<b>PERSEVERATION:</b>	Continuance of an activity after it ceases to be an appropriate response; persistent repetition of words, ideas, or subjects so that once an individual begins speaking about a subject or uses a particular word, it continually recurs.
<b>PHONEMES:</b>	Basic units of speech in a given language which are combined to form a spoken word.
<b>PHONETIC DISCRIMINATION:</b>	The ability to determine if a pair of sounds (phonemes) are the same or different. The general ability to distinguish between similar words or sounds.
<b>PLANNING:</b>	Planning involves the ability to conceptualize change from present circumstances, and view the environment objectively. The ability to conceive of alternatives, weigh and make choices, and involve a conceptual framework or structure that will give direction to the carrying out of a plan; requires a capacity for sustained attention.
<b>PRAXIS:</b>	The motor integration employed in the execution of complex learned movements.
<b>PSYCHOTHERAPY:</b>	A systematic and rather structured series of interactions between a therapist and a client. The goal is to produce in the client emotional, cognitive, or behavioral changes.
<b>PTOSIS:</b>	Drooping eyelid.
<b>SCALED SCORE:</b>	A derived standard score used in the Wechsler Adult Intelligence Scale, revised with a mean of ten and a standard deviation of three.
<b>SEIZURE DISORDER:</b>	An organic disorder characterized by irregularly occurring disturbances in consciousness in the form of seizures or convulsions. The seizures are due to a disruption in the electrical and physiochemical activity of the discharging cells of the brain.
<b>SENSORY MOTOR:</b>	Combination of the input of sense organs and the output of motor activity.
<b>SPASTIC:</b>	Of the nature of or characterized by involuntary spasms; hypertonic; muscles stiffen and purposeful movements are difficult.



<b>SPASTICITY:</b>	The state of increased tension in a muscle; heightened resistance to the extension or flexion of a joint.
<b>STANDARD DEVIATION (SD):</b>	A measure of the variability or dispersion of a distribution of scores. Computation of the SD is based on the square of the deviation of each score from the mean. The SD is sometimes called "sigma." In a normal distribution approximately 67% of the population is within one standard deviation of the mean.
<b>STANDARD SCORES:</b>	Scores that express an individual's distance from the mean in terms of the standard deviation of the distribution. Examples are T Scores, Deviation IQs, Z Scores, and Stanines.
<b>T SCORE:</b>	A derived standard score with a mean of 50 and a standard deviation of three. (See also standard scores.)
<b>TACTILE:</b>	Pertaining to touch.
<b>TEMPORAL LOBE:</b>	One of the four lobes of the cerebral hemisphere; it lies in an inferior and lateral position.
<b>UNILATERAL:</b>	One-sided.
<b>VALIDITY:</b>	The degree to which a test measures what it is intended to measure.
<b>VENTRICLE:</b>	A small cavity, such as the right or left ventriculus of the heart or the ventriculus of the brain.
<b>VERTIGO:</b>	Feeling of spinning or rotation, as well as non-rotatory swaying, weakness, faintness, and light headedness.
<b>VISUAL FIELD:</b>	All of the objects visible to the unmoving eye of a particular observer at a given moment.
<b>VISUAL PERCEPTION:</b>	The identification, organization, and interpretation of visual stimuli.
<b>Z SCORE:</b>	A linearly derived standard score with a mean of zero standard deviation of one. (See also standard scores.)

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## ***APPENDIX 2: Case Study and Sample Report***

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### **FUNCTIONAL ASSESSMENT REPORT**

#### **SPECIFIC REFERRAL QUESTIONS**

Julia is a 22 year-old female who was referred for functional assessment by her Office of Vocational Rehabilitation (OVR) counselor, Sally Smith. Julia is currently unemployed and last worked cleaning tables at a food court at a local mall. She was let go after 4 days due to slow performance. She also worked as a temporary stock person for Hills Department Store from November, 1992 to January, 1993. Previously, she had been a dental assistant for XXX Dental Centers from May, 1992 to November, 1992 but had been laid off because she failed to pass the x-ray certification exam on several occasions. For two years prior to that, Julia worked as a dental assistant for a private dental practice.

Julia contacted OVR for financial assistance to pursue a 4 year degree in dental hygiene at the University of XXX. This goal has developed because of her vo-tech training in high school as a dental assistant, experience on the job, and her feeling that this field would provide a reasonable income to her. She did not identify any potential obstacles to her achieving this goal other than financial constraints. In light of Julia's history of academic difficulties and her previous assignment to classes for individuals with learning disabilities (LD), Julia and her OVR counselor arrived at the following specific referral questions in a pre-assessment staffing:

- 1) Are Julia's plans to pursue a 4 year degree in dental hygiene and to obtain competitive employment in the field commensurate with her abilities?
- 2) What are potential obstacles to training in this field?
- 3) If this career is not feasible, what alternative vocations could Julia consider as viable options?
- 4) What are Julia's academic strengths and weaknesses?
- 5) What specific academic accommodations should be made to utilize Julia's best learning style?

## **BACKGROUND INFORMATION**

While prenatal history was described as unremarkable, Julia was born three weeks premature and was kept in the hospital for an unspecified period of time due to unexplained, high fevers. Developmental delays were denied, except for gross motor delays, which necessitated her wearing orthopedic shoes. She had a number of ear infections and some temporary hearing loss as a child and had myringotomy tubes inserted at age four. She began to wear glasses at age nine. She was diagnosed with juvenile diabetes at age 11 and has taken insulin shots twice a day since then.

Current medical problems include a detached retina for which Julia has had 3 surgeries on her left eye, the last of which included a contact lens implant. Julia denied knowledge of any visual impairment or a deteriorating visual condition, although ophthalmological reports indicate uncorrectable blurred vision. She manages her diabetes without problems and reported good control of blood sugars.

Educationally, Julia graduated from ABC Jr/Sr High School in 1989. She attended ABC Vo-Tech in the area of dental hygiene during her senior year and received a dental assistant certificate. Julia attended ABC Elementary School for grades 3 through 6, and ABC Elementary for kindergarten through 2. She repeated the 1st grade due to immaturity and was diagnosed as learning disabled in 3rd grade. She continued to receive LD resource room support for reading through high school.

Julia is the oldest of two children. Both parents completed high school and her father is self-employed. Julia described periods of depression for the past 5 years, although she has not sought mental health counseling for this. Current symptoms include poor concentration, depressed mood, low self-esteem, fatigue, irritability, mood lability, and impulsivity. Stressors include financial problems due to unemployment.

## **GENERAL BEHAVIORAL OBSERVATIONS**

Julia presented as a casually dressed young woman with somewhat dysmorphic facial features. She had noticeable skin problems and poor dental hygiene. During the pre-assessment staffing and the assessment, Julia was cooperative, motivated, and appeared to be invested in the assessment process. Julia was able to adequately establish rapport with the examiners and sustained her maximum effort throughout the testing. Results can be interpreted with full confidence as a valid reflection of her current abilities.

Initially, Julia's assessment was scheduled for February 23, 1993, but Julia failed to arrive or call to cancel appointments for this week, despite requests that she do so. Once the assessment was underway, Julia did attend regularly and was on time. She failed to participate in follow-up plans where she was required to initiate collecting information and calling to schedule an appointment.

Julia was considered to be inaccurate in her appraisal of her own performance and her abilities.

## **NEUROPSYCHOLOGICAL TEST RESULTS**

Results of intellectual achievement and neuropsychological testing are presented on Tables 1 and 2 (pages 95 & 96) which specify overall level of functioning for each test. Table 3 (page 97) provides an overall rating of functional cognitive strengths and weaknesses based on test performance and clinician observations. Also evident during testing was weakness in visual acuity and hearing in the left ear.

## **CLINICAL AND DIAGNOSTIC SUMMARY**

As seen in Table 3 (page 97), results of the assessment place Julia's current level of intellectual functioning within the borderline range, with borderline verbal and low average nonverbal abilities.

Assessment of academic skills, also in Table 2 (page 96), reveals that reading, writing, and math skills were commensurate with intellectual abilities. In general, academic skills are at about the 5th to 6th grade level. These results do not support the presence of an academically based specific developmental disorder; no discrepancy exists between measures of intellectual capacity and academic performance.

On the neuropsychological evaluation, results indicate a number of significant deficits, with overall performance within the impaired range. Results are summarized in Table 3 (page 97) and are reflective of diffuse, generalized, organic dysfunction, with more involvement in executive skills (planning, organizing, self-evaluation). Results warrant DSM III-R diagnosis of Organic Mental Disorder - Not Otherwise Specified.

## **VOCATIONAL EXPLORATION**

Results of the vocational exploration indicated that Julia's only identified career interest was in the area of dental hygiene. She indicated willingness to work part-time in the areas of child care, sales, or assisting in a dental office while simultaneously attending a 4-year college program. Attempts were made during the assessment to explore alternative career options, but Julia was reluctant to do so. Attempts to engage her in problem solving in this area resulted in her expressing anger and resentment, feeling that her wishes were not being respected. Despite information that her current academic abilities indicate that she will not be able to handle college-level academic work, Julia persisted in her hopes that OVR would fund her going to college on a full-time basis nevertheless. During the post-assessment staffing and one additional subsequent meeting, Julia eventually changed her position on this issue and indicated plans to pursue training through the Special Needs Programs at Community College.

Phone calls were made to previous employers to gain additional information about job performance. Results indicated functional limitations in complex problem solving and essential job duties, although one employer, in particular, described a willingness to make allowances for her. Attendance was also noted to be irregular due to frequent, unspecified illnesses.

## **SITUATIONAL ASSESSMENTS**

Julia participated in a number of situational assessments. Results reveal relative strength in her ability to perform structured work activities, with adequate attention span and motivation. Although performance was slow and sometimes inaccurate, she was able to successfully approximate the completion of all tasks. As situations became less structured and more complex, Julia's performance declined. Weakness in executive skills such as planning, organization, and self-evaluation were apparent. Speed of work was observed to be slow. In self-evaluation, Julia was consistent in feeling that her performance on all tasks was average to above average, even when problems were clearly identified. Julia's inability to evaluate her own behavior and problem solve in novel situations was a pattern seen throughout simulations. Additionally, performance in simulations revealed possible auditory processing weaknesses. In a message taking situation, 2/3 of phone messages taken were inaccurate for critical information.

## **SIMULATED JOB INTERVIEW**

Julia was requested to participate in a simulated job interview, based on her selection of a job for which she was qualified. Julia selected a secretarial position, and presented a typed letter of interest in conjunction with her resume, as requested by staff. Julia was appropriately dressed for a formal job interview, and engaged in a polite discussion with the interviewer. Actual content of responses, however, was inadequate to obtain a job; Julia described her primary weakness as typing, and when confronted with this as a primary job task, could only state that she would practice to get better. She actively described her interests in pursuing dental hygiene over a career in business, and when pressed, admitted that she only sought the job for financial reasons. Julia denied having any special problems that would interfere with job performance, despite her long history of academic problems. Overall, interview content worked against Julia as a viable employee for the job she chose. Specific feedback was provided to her on this point, with recommendations for her to "sell herself better" from the employers perspective, and to prepare herself to provide concrete information about herself, available hours, and motivation for job/employer selection, and to demonstrate interest by posing specific questions to an interviewer.

## **FOLLOW-UP**

As Julia's career goals did not appear to be achievable in light of the results of the assessment and contact with previous employers, an attempt was made to engage Julia in a guided, self-directed activity where it was hoped she would be able to re-assess the appropriateness of her vocational plans. Julia attended two follow-up sessions after the 5 day assessment. She did follow-up in obtaining information about XXX's program and prerequisite courses at YYY Community College. Despite her being able to identify the need to do so, she failed to contact admissions staff at the University of XXX to gain more information about admission requirements. Even though she was contacted on several occasions, Julia never did complete this agreed-upon activity, and the assessment was considered complete at that point.

## **LIST OF FUNCTIONAL ABILITIES**

- + Pragmatic use of language skills, appropriate conversational skills
- + Adequate memory for daily activities
- + Able to sustain her attention for an entire work day

## **LIST OF FUNCTIONAL LIMITATIONS**

- Poor insight, planning, and follow through on tasks
- Difficulty assessing her own strengths and weaknesses
- Limited academic abilities
- Slow fine motor speed
- Poor vision
- Possible hearing loss in left ear
- Concrete language and comprehension
- Inconsistent attendance, follow-up appointments, and telephone calls

## **FUNCTIONAL IMPLICATIONS AND VOCATIONAL IMPACT**

See reports tables on pages 95, 96, and 97.

## **RECOMMENDED VOCATIONAL DIRECTIONS**

Julia's identified interest in pursuing a 4 year program in dental hygiene is not felt to be consistent with Julia's visual limitations and academic abilities. In a series of meetings following the assessment, she agreed to consider alternative training and employment options. The programs for special needs students at CCAC were recommended, and Julia, with consultation from her mother, agreed to obtain information about two programs, one as a Nursing Assistant and one in Child Care.

## POTENTIAL OBSTACLES

One potential obstacle to implementing the recommended plan is Julia's inability to follow through with plans in an unstructured situation. For example, despite indicating a willingness to contact these programs and enroll for the fall of 1993, it is likely that she will not be able to independently complete these activities. Ongoing, structured, follow-up services are thought to be an essential requirement to Julia's successfully enrolling and completing such a program. In addition, Julia has a chronic history of absenteeism due to illness that will severely tax the limits of most employers and prohibit regular class attendance.

## SUMMARY

The functional assessment procedures indicate the following summary responses to the referral questions:

- 1) Are Julia's plans to pursue a 4 year degree in dental hygiene and obtain competitive employment in the field commensurate with her abilities? Julia shows evidence of diffuse organic generalized brain dysfunction, borderline intelligence, and academic abilities at the 4th to 6th grade level. She does not demonstrate good insight into her own cognitive strengths and weaknesses. Her plans to pursue a 4 year degree in dental hygiene are unrealistic.
- 2) What are potential obstacles to training in this field? Her visual, intellectual, and academic weaknesses are the greatest obstacles.
- 3) What are Julia's strengths and weaknesses? Strengths and weaknesses are summarized in the previous page.
- 4) What specific academic accommodations should be made to utilize Julia's best learning style? A learning situation that has limited academic requirements and that focuses on hands-on learning and practice are recommended. A program for special needs students is recommended.

## DIAGNOSTIC IMPRESSIONS

AXIS I: Organic Mental Disorder - NOS (294.80)  
AXIS II: Borderline Intellectual Functioning (V40.00)  
AXIS III: Diabetes

## **RECOMMENDATIONS**

- 1) Due to Julia's demonstrated inability to follow up with specific, job-related recommendations, ongoing, structured, follow-up services on a weekly basis are strongly recommended. Continued vocational counseling to address the issue of self-appraisal as it applied to job skills should also be pursued. These services are available through Julia's Base Service Unit (BSU), XXX MH/MR or through Behavioral Neuropsychology Associates on a fee-for-service basis.
- 2) Despite the accommodations that have been designed into CCAC's programs for special needs students, Julia may find the academic demands in the nursing assistant program to be beyond her abilities. She is encouraged to use the Special Services Department at YYY for tutoring, taped lectures, etc.
- 3) Julia would like to obtain immediate employment and is willing to consider a variety of job options. She would benefit from specific training in job-related skills such as identifying jobs that are appropriate for her skills, writing error-free letters of interest, and learning to interview in such a way as to present herself in the best possible light. A job club may allow Julia to learn from possible strategies that others have found to be effective. Julia's OVR counselor indicated that these services are available at VRC. Julia would also benefit from job coaching for help in learning a new job and to devise accommodative strategies for her slow speed and tendency to overestimate her performance abilities.

## **OUTCOME**

Although Julia expressed reluctance to change her vocational goal during the assessment, she did make some alternate plans soon after completing the process. She was referred by her OVR counselor to a local job development program for individuals with disabilities. She completed on-the-job training in the mailroom of a county government office. Following the training she was offered a full-time position which she accepted.



**Report Table 1  
Implications for Specific Job Demands**

<b>Vocational Objectives</b>	<b>Functional Limitations</b>	<b>Vocational Impact</b>	<b>Rehabilitation Strategies</b>
Dental Assistant: Clinical assisting Instrument cleaning Patient instruction X-rays Office work - billing, receptionist, record keeping  Stress: reliability, manual dexterity, sociability	Poor study/testing skills	Can't pass required x-ray test	Study skills/test taking strategies. Focused, specific tutoring
	Poor visual acuity	Difficulty with instrument recognition  Slow or inaccurate record keeping	Accommodations can include color-coding handles, using a magnifier, structured way of setting up instrument trays
	Inconsistent attendance or follow through	Late for job  Misses days	Individual counseling to discuss scheduling work and the real-life consequences for missing work  Consider a group-based job in a supportive environment
	Poor prospective memory - poor recall of rote information	Forgets messages or confuses messages  Forgets to perform tasks around the office	Establish "rules" for daily tasks - write down daily tasks and have Julia check them off as they are done. Write down duties for the day. Check with office manager to insure that all duties have been done.
	Difficulty understanding new tasks or higher level conceptual issues	May have difficulty providing clients with education or instructions  Does not anticipate needs of clients or dentist	Rehearse and write down specific strategies to be used in situations, being as specific and comprehensive as possible

**Report Table 3**  
**BEHAVIORAL NEUROPSYCHOLOGY ASSOCIATES**

**Assessment Data Summary Sheet**

<b>Name:</b>	Julia	<b>Date:</b>	3/03/93
<b>Age:</b>	22	<b>Sex:</b>	F
<b>Education:</b>	12	<b>Hand Dominance:</b>	R

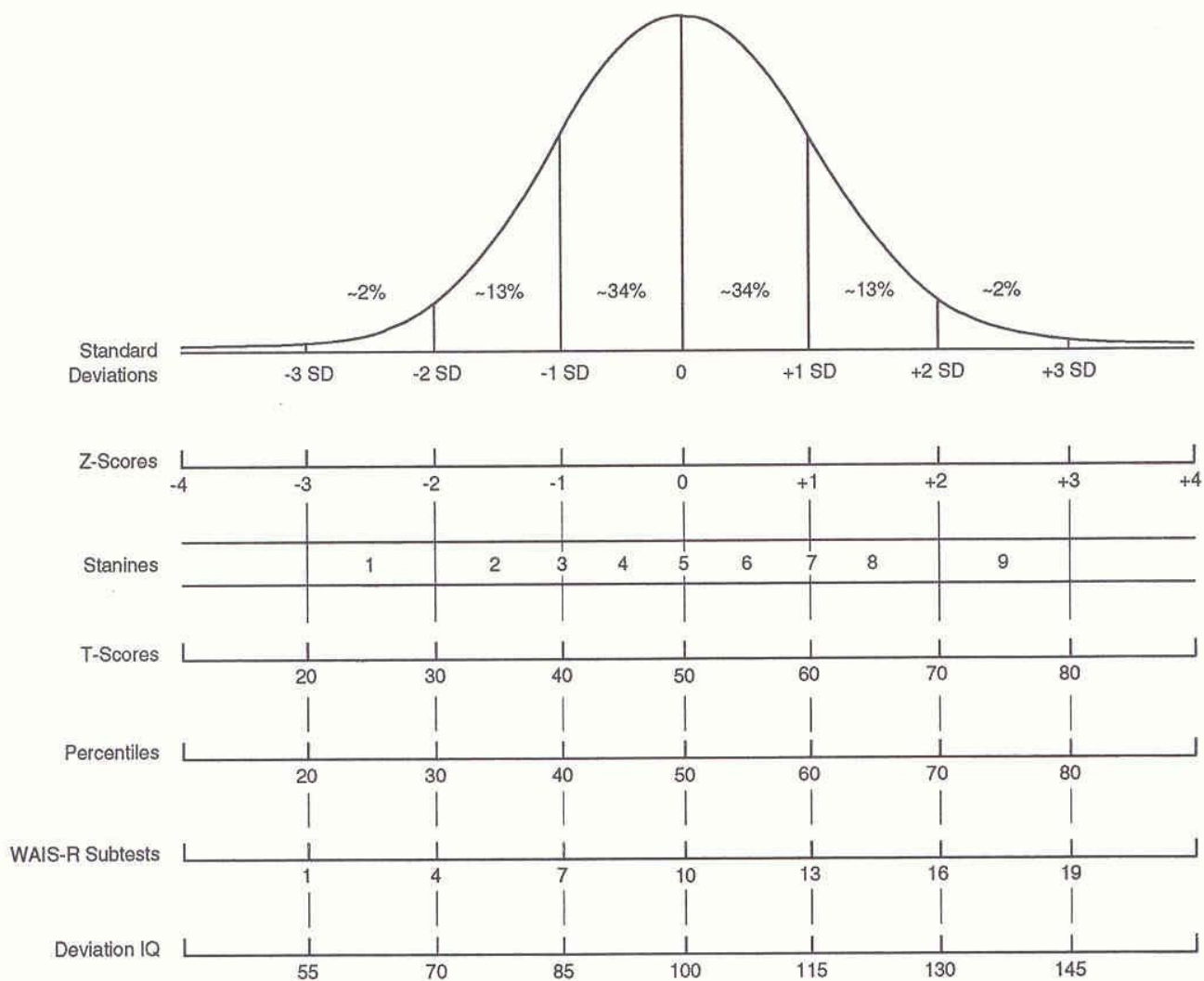
<u>TEST</u>	<u>SCORE</u>	<u>INTERPRETATION</u>
<b>General Intellectual Functioning</b>		
<b>WAIS-R</b>		
<u>Verbal</u>		
Information	04	Deficient
Digit Span	07	Low Average
Vocabulary	05	Borderline
Arithmetic	06	Borderline
Comprehension	07	Low Average
Similarities	08	Average
<u>Performance</u>		
Picture Completion	11	Average
Picture Arrangement	08	Average
Block Design	06	Borderline
Object Assembly	07	Low Average
Digit Symbol	08	Average
Verbal IQ:	79	Borderline
Performance IQ:	83	Low Average
Full Scale IQ:	79	Borderline
<b>Academic Achievement</b>		
<b>Woodcock-Johnson Revised</b>		
Broad Reading	84	Low Average
Broad Math	78	Borderline
Basic Writing Skills	77	Borderline

**Report Table 2  
Implications for Specific Job Demands**

<b>Vocational Objectives</b>	<b>Functional Limitations</b>	<b>Vocational Impact</b>	<b>Rehabilitation Strategies</b>
Dental Hygienist: Cleans teeth Examines gums Inspects teeth Xrays teeth Provides patient education	Reading, writing, and math abilities are at about the 5th -6th grade level	Will not be eligible for admission in a 4 year, competitive college program	None - ACLD is not recommended as current academic skills cannot be remediated to a college level  One suggestion is to consider a "guided failure" approach. Emphasize other options
	Diminishing visual acuity	Will not be able to adequately perform visual functions of a dental hygienist	Try simulations set up through vo-tech program. Stress product monitoring
	Limited self-evaluation including poor personal dental hygiene	Poor role model for patient education tasks	Establish self-management program with outside monitoring
	Limited problem solving ability	Will have difficulty on the job with higher level procedures and understanding	Individual cognitive remediation to teach problem-solving strategies by modeling and rehearsal

# APPENDIX 3: Test Interpretation Guide

Test Score Equivalents in a Normal Distribution



Adapted from Psychological Corporation, Test Service Bulletin, No. 48, 1955.

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# ***APPENDIX 4: Test Descriptions***

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## **Introduction**

This is a brief description of tests and measures commonly employed as part of a comprehensive neuropsychological examination. It is meant as a general guide to assist counselors in interpreting test results and in providing information to consumers. This guide is not meant to be comprehensive and the actual procedures used in a neuropsychological examination will vary based on the nature of the referral question. If there are specific questions regarding tests, measurements, or procedures, please contact a consulting psychologist.

## **Intelligence and Achievement Tests**

**WECHSLER ADULT INTELLIGENCE SCALE-REVISED (WAIS-R).** The WAIS-R is an individually administered intelligence test consisting of 11 different subtests: 6 verbal subtests and 5 performance subtests. The WAIS-R usually takes 60 to 75 minutes to administer. Administration and scoring procedures are highly standardized, with detailed instruction provided in the test manual. The 11 WAIS-R subtests are: (Verbal) Information, Comprehension, Arithmetic, Vocabulary, Digit Span, and Similarities; (Performance) Picture Completion, Picture Arrangement, Block Design, Object Assembly, and Digit Symbol.

**PEABODY PICTURE VOCABULARY TEST (PPVT).** This test is an individually administered, norm-referenced test of hearing vocabulary available in two parallel forms (L and M). Both forms are comprised of five sample items followed by 175 test items arranged in order of increasing difficulty. The subject's task is to select the picture considered to illustrate best the meaning of a stimulus word presented orally by the examiner.

**WIDE RANGE ACHIEVEMENT TEST (WRAT).** The WRAT is a standardized measure of academic abilities. The test measures reading word recognition, written spelling, and arithmetic computation. The three subtests are easily administered and scored, usually in less than 30 minutes. The test yields three raw scores: one for each subtest, reflecting the total number of items completed correctly. Raw scores are converted into grade equivalents, percentiles, and standard scores, using the norm tables provided in the manual. Norms are available from age 5 years 5 months to age 64. Advantages of the WRAT include its ease of administration and scoring, its wide acceptance both in education and psychology, and its large normative sample.

**PEABODY INDIVIDUAL ACHIEVEMENT TEST.** A wide-range screening measure of achievement in the areas of mathematics, reading, spelling and general information. The battery is untimed but generally takes 40 minutes to administer. Scores are presented as grade and age equivalents, percentile ranks and standard scores.

**WOODCOCK-JOHNSON PSYCHOEDUCATIONAL BATTERY -REVISED.** A comprehensive measure of the cognitive ability and achievement of individuals ranging from preschool level to adult. The battery is composed of 27 subtests including Reasoning, Perceptual Speed, Mathematics and Written Language. Administration time is typically 2 to 2 1/2 hours.

**GATES-MACGINITIE READING TESTS.** This test is a multiple-choice paper-and-pencil test used to assess basic reading skills. The test has a vocabulary section and a reading comprehension section in which the subject reads short paragraphs and answers written questions about the paragraphs. Both sections are timed, with 20 minutes allowed for the vocabulary section and 35 minutes for the reading comprehension section. The reading comprehension test is advantageous in that it appears to tap reading skills required in everyday usage.

**GRAY ORAL READING TESTS-REVISED.** From grades one to college level, the GORT-R has two forms (4 on 1967 GORT), with each form containing thirteen reading selections or passages. The tests are designed to assess oral reading and to aid in diagnosing reading difficulties.

**WOODCOCK READING MASTERY TESTS.** Composed of five individually administered reading tests for use from grades K to 12, measuring Letter Identification, Word Identification, Word Attack, Word Comprehension and Passage Comprehension.

**MONROE-SHERMAN READING APTITUDE AND ACHIEVEMENT TESTS.** Is a group of individually administered series of tests assessing paragraph understanding, spelling, word discrimination, and arithmetic computation. Scores are presented as grade equivalents.

## **Personality Tests**

**MINNESOTA MULTIPHASIC PERSONALITY INVENTORY (MMPI).** This 566-item true and false questionnaire has been a widely used clinical and research tool. Test results are presented as a profile of validity and clinical scales. Abbreviated versions of the MMPI are also available.

**MILLON CLINICAL MULTIAXIAL INVENTORY (MCMI).** The MCMI is an objective personality test. Subjects answer true/false questions; interpretations of the resultant profile focus on personality characteristics and psychopathology.

**SIXTEEN PERSONALITY FACTOR QUESTIONNAIRE (16PF).** This is a self report inventory assessing personality on sixteen dimensions or scales. A variety of test forms are available.

**THEMATIC APPERCEPTION TEST (TAT).** The TAT consists of vague black and white pictures which the subject is asked to use to generate associated stories. The TAT is one of the most widely used story telling projective tests for adults.

**RORSCHACH TEST.** The Rorschach test is probably the best known of the projective techniques. The subject is shown each ink blot one at a time and is asked to report what the blot reminds him of. A number of scoring systems are available based on major response variables such as number of responses, color and shading, and the verbatim content of the response.

## **Neuropsychological Batteries**

### **HALSTEAD-REITAN NEUROPSYCHOLOGICAL TEST BATTERY.**

The Halstead-Reitan Neuropsychological Test Battery (HRNTB) consists of a number of individual tests which, when administered together, comprise a battery. The Halstead-Reitan measures large samples of behavior in a number of areas associated with brain function: motor, sensory, visual-spatial, language, memory, auditory-perceptual, and higher level conceptual abilities. Each test may measure a variety of functions which may not be clearly defined. For example, the Speech Sounds Perception Test is a measure of the ability to hear speech sounds and match sounds into their written equivalent, as well as attend for an extended period of time. Errors may result from deficits in any or all of these areas, thus a great deal of clinical judgment is required in the interpretation of results. The battery tends to be a "right hemisphere" oriented battery in that much of the focus is on nonlinguistic, visual-spatial, and sensory/kinesthetic tasks.

The battery was originally developed by Ward Halstead at the University of Chicago in 1935. Halstead began by attempting to develop a test battery to measure "biological intelligence." He performed extensive formal and informal studies on brain damaged individuals, culminating in the introduction of various tests able to measure brain dysfunction. Halstead's original battery consisted of 13 tests, designed to reflect brain impairment. Halstead also developed the Impairment Index, a method of detecting brain impairment by using a combination of psychological test results.

Ralph Reitan, a graduate student of Halstead, made additions and improvements to the battery, and performed studies which clearly documented the validity of the battery in the discrimination of brain damaged and normal individuals.

There are three forms of the Halstead-Reitan battery: the HRNTB for Adults (age 15 and

above), the Halstead Neuropsychological Battery for Children (age 9-14), and the Reitan-Indiana Neuropsychological Test Battery for Children (age 5-8). Administration of the battery usually takes between five and eight hours with individual tests ranging from 10 minutes to one hour or more. It involves interactive testing between examiner and subject. The test is tiring and frustrating for subjects, particularly those with significant brain impairment. Because of the amount of time necessary and the sophisticated apparatus required, the Halstead-Reitan is a costly battery to administer.

The Halstead-Reitan Neuropsychological Test Battery is the most widely researched neuropsychological test battery; thus, extensive validity data is available on the identification, lateralization and localization of brain dysfunction. Numerous cross-validations have upheld Reitan's original validity studies. Reliability of the Halstead-Reitan has been less rigorously evaluated. In general, reliability appears good. Test-retest reliability of the individual tests ranges from .59 (TPT localization) to .87 (Trail Making Test, Part B).

This battery of tests includes the original neuropsychological tests developed by Ward Halstead and the modifications and additions of Ralph Reitan. The battery is comprised of the following tests.

**CATEGORY TEST.** A test of abstracting ability. Stimulus figures, which vary in size, location, shape, number, color and intensity, and are grouped by abstract principles, are projected on a screen. The task of the subject is to figure out the principle relating stimuli within a subtest and signal the answer by pressing the appropriate key on a board. The test is an excellent discriminator between brain damaged and neurologically intact groups. The test measures the ability to sustain attention, remember past performance, evaluate past performance and learn from feedback, concentrate, analyze visually presented material, understand spatial relationships, and demonstrate cognitive flexibility in handling a complex, changing problem.

**TACTUAL PERFORMANCE TEST.** The Tactual Performance Test (TPT) uses a modification of the Seguin-Goddard form board. The subject is blindfolded and is not permitted to see the stimulus material. The task is to fit blocks into the proper spaces on the board using first the preferred hand, then the nonpreferred hand, then both hands. Times are recorded for each trial and also for the total time required for all three trials. The stimulus materials are then put away and the blindfold is removed. The subject is then asked to draw a diagram of the board representing the blocks in their proper spaces. The drawing is scored based upon the number of blocks correctly reproduced (Memory) and the number correctly placed (Localization). The test requires the ability to recognize forms tactually, perform coordinated movements of the hands and arms, perceive their own movement in space without visual cues, and plan and solve nonverbal kinesthetic problems. Performance of the right and left sides of the body is evaluated on the TPT. The Memory and Localization components require both spatial and incidental memory. Performance on this test is commonly associated with the integrity of tactile perception, tactile learning, and tactile memory. It is also a measure of kinesthetic (i.e., body awareness) functions. The difference between the time taken on the preferred hand and that on the non-preferred hand trials may provide a clue as to the integrity or right versus left cerebral hemispheres.

**RHYTHM TEST.** The Rhythm Test is a subtest of the Seashore Test of Musical Talent. The



subject must discriminate between 30 pairs of rhythmic beats which are sometimes the same and sometimes different. The task measures alertness to nonverbal auditory stimuli, sustained attention to the task, and the ability to perceive and compare different rhythmic sequences. Because of the attentional component, the Rhythm test is not felt to be an effective discriminator between functional psychiatric disorders and organicity.

**SPEECH SOUNDS PERCEPTION TEST.** The Speech Sounds test consists of 60 spoken nonsense syllables, the beginning and ending consonant sounds of which vary while their "ee" vowel sound remains constant. The subject must underline the spoken syllable, selecting from four alternatives printed on the test form. The test requires attention, auditory perception of verbal material, and the ability to match phonemes with their written equivalents (graphemes).

**FINGER OSCILLATION TEST.** Finger tapping is a measure of fine motor speed which uses a mounted tapper equipped with a counter. The subject is administered several consecutive trials to each hand until attaining a criteria of five trials within a five-point range of each other. The score for the dominant hand and the nondominant hand is the average of the five trials. Fine motor speed, coordination and left-right body comparisons are assessed.

**TRAIL MAKING TEST.** This test consists of two parts, Trails A and Trails B. Trails A consists of 25 circles distributed randomly over a sheet of paper and numbered from 1 to 25. The subject is required to connect the circles with a pencil line in ascending numerical order. Part B also consists of 25 circles, these numbered from 1 to 13 and lettered from A to L. The individual is urged to connect the circles "as fast as you can" without lifting the pencil from the paper. When the number of seconds taken to complete Part A is relatively much less than that taken to complete Part B, the individual probably has difficulty in complex, double, or multiple, conceptual tracking. Slow performance on Part B of the Trail Making Test points to the likelihood of brain damage, but alone does not indicate whether the problem is one of motor slowing, in coordination, visual scanning difficulties, poor motivation, or conceptual confusion. High diagnostic prediction rates are found in discriminating between brain injured patients and normal control subjects. However, its diagnostic effect in differentiating brain injury from psychiatric patients has not been consistent. Performance on this test shows how effectively the subject responds to a visual array of any complexity, how well he or she performs when following a sequence mentally or dealing with more than one thought at a time, or how flexible he or she is in shifting the course of on-going activity.

**STRENGTH OF GRIP TEST.** A plunger type dynamometer with a grip adjustable for hand size is used to measure strength. Trials alternating between the dominant and nondominant hand are administered with the score being the average between two trials for each hand. The test measures grip strength as well as providing a comparison of the right and left sides of the body.

**SENSORY-PERCEPTUAL EXAMINATION.** This test measures tactile, auditory, and visual

perceptual abilities. The procedures require the subject to perceive unilaterally presented stimuli on each side of the body. Next, stimuli are presented in a bilateral, simultaneous manner to determine the subject's ability to perceive both stimuli. Tactile, visual, and auditory sensitivity are measured, as well as left-right comparisons.

**TACTILE FINGER LOCALIZATION.** Light tactile stimuli (finger touch) are presented to each finger of the dominant and nondominant hand while the subject's eyes are closed. The subject identifies which finger is touched, using a predetermined numbering system. Each finger on each hand is touched four times and the number of errors are recorded. Tactile perception and right-left comparisons are measured.

**FINGERTIP NUMBER WRITING PERCEPTION.** The numbers 3,4,5, or 6 are traced on the subject's fingertips. With eyes closed, the subject must identify the numbers presented four times to each hand in a predetermined order. The score is the number of errors. The test provides a measure of graphesthesia and left-right comparisons.

**TACTILE FORM RECOGNITION.** The subject places one hand through a hole in a board, and a plastic chip in one of four forms (circle, cross, square, or triangle) is placed on their fingertips. Without seeing the chip, the subject must point to the corresponding chip displayed on the board. Each of the four chips are presented twice to each hand. The score is the total errors and response time for each hand. The test measures stereognostic abilities and left-right comparisons.

**MODIFIED HALSTEAD-WEPMAN APHASIA SCREENING TEST.** This procedure provides a measure of several aspects of language ability and usage, including the ability to name common objects, spell, read, identify numbers and letters, write, do arithmetic calculations, articulate, identify body parts, perform pretended movements, understand the meaning of spoken language, follow directions, and differentiate left from right. It also tests visual constructional abilities (drawing) and provides samples of the subject's attempts at reproducing the spatial configuration of several forms.

*In addition to the above noted tests, the Wechsler Adult Intelligence Scale and the Wide Range Achievement Test are administered as part of the Halstead-Reitan Neuropsychological Test Battery.*

## **Interpretation of the Halstead-Reitan Neuropsychological Test Battery**

Results of the Halstead-Reitan Neuropsychological Test Battery are interpreted on a number of levels. The most basic level is to determine whether each single test score falls within a normal or impaired range. This is done through comparison with single cut-off criterion scores established by Reitan. In addition to interpretation of single tests, the Impairment Index, originally designed by Halstead, reflects overall performance on the battery of tests. The Impairment Index is

calculated as the number of tests falling within the impaired range divided by the total number of tests. For the Halstead-Reitan Neuropsychological Test Battery, these seven tests are used in the calculation of the Impairment Index: the Rhythm Test, Speech Sounds Perception Test, dominant hand Finger Oscillation, Category Test, Tactual Performance Test total time, memory, and localization. The minimum Impairment Index score reflecting no impairment, is 0.0--none of the tests within an impaired range. A maximum score of 1.0 on the Impairment Index indicated that all scores are within the brain damaged range. Reitan suggests that Impairment Index scores above 0.45 are considered indicative of brain damage.

Another method of interpretation of raw Halstead-Reitan scores was introduced by Russell, Neuringer, and Goldstein in 1970. Instead of using a single cut-off score, this system rates each test on a six-point scale (0 - 5). In addition to providing a uniform coding system, the Russell et al. classification adds to Reitan's method of scoring results in that this system allows for severity of impairment rather than tallying the number of tests within the impaired range. Ratings range from 0 (above average) and 1 (no impairment) to 5 (very severe impairment). Ratings of 2, 3, and 4 reflect mild, moderate, and severely impaired levels of performance. Ratings of 2 or more are equivalent to being past the cut-off score for presence of brain dysfunction as established by Reitan's initial validation study.

An Average Impairment Rating is also calculated in the Russell, Neuringer, and Goldstein system. It represents the average of individual test ratings. An Average Impairment Rating of above 1.65 is considered to be indicative of the presence of brain dysfunction. To illustrate the advantages of the Russell et al. system, consider two individual subjects obtaining a Halstead Impairment Index of 1.0. Both fall at the maximum level of brain dysfunction possible using the Reitan Impairment Index. However, when converting these same raw scores using the Russell et al. system, it would be possible for the Average Impairment Index to reflect significant performance differences; for example, 2.0 in one subject and 4.5 in another. While the interpretation for the first subject is one of mild, generalized impairment (all scores within a mildly impaired range), subject 2's performance reflects severe, global impairment of brain functions. Thus, this alternative scoring system is able to incorporate broader images of performance, both for clinical and research purposes.

## **Strengths and Weaknesses of the Halstead-Reitan Neuropsychological Test Battery**

Advantages of the HRNTB include its ability to measure a wide variety of brain functions in a highly standardized fashion. The Halstead-Reitan is the most widely researched neuropsychological test battery, thus extensive validation is available. The battery provides for the collection of research data which is objective and standardized. Finally, interpretation and inferences drawn from the Halstead-Reitan allow for the identification of test patterns and relationships, empirically typed to the many variants of brain dysfunction.

The major disadvantage of the Halstead-Reitan Neuropsychological Test Battery is its cost, both in terms of its time of administration and cost of administration and material. Time of administration for the entire battery is approximately six hours, which presents a significant limitation when testing impaired patients. Cost of materials for the Halstead-Reitan exceeds \$1,300 and the average cost of a single administration of the battery ranges between \$200 and \$500.

Other disadvantages include the dependence on motor skills and the failure of the battery to address significant areas of possible neuropsychological deficit, including memory functions and language skills. A final weakness is its failure to effectively discriminate between schizophrenic and brain damaged populations.

### **THE LURIA-NEBRASKA NEUROPSYCHOLOGICAL BATTERY.**

The Luria-Nebraska Neuropsychological Battery (LNNB) is a test battery which is composed of 269 individual items based upon the neuropsychological test procedures developed by the Russian psychologist, A.R. Luria. In his extensive study of the functions of the brain, Luria developed procedures which he reported could localize disorders of the brain and, because of the specificity of his test items, could contribute valuable information to the planning of rehabilitation treatment. Luria's approach is termed a "qualitative" approach to neuropsychological examination in that the procedure is guided by clinical insight into a particular patient's performance. Tests are administered in a flexible fashion, focusing upon areas of deficit and bypassing areas judged to be intact. Clinical interpretation, rather than comparison with standard normative information, was used by Luria to infer the presence of brain damage and to make specific recommendations for treatment. While Luria was quite effective in using this approach to neuropsychological evaluation, several limitations arise in applying Luria's tests in the United States. The lack of any standardized manner for test administration, standardized materials, normative data for interpretative comparison, or data on the reliability and validity of procedures present significant obstacles to the use of these procedures.

Acknowledging the potential value of Luria's tests in the diagnosis and treatment of brain disorders, Golden and his colleagues undertook a standardization of these tests, which were originally translated from Russian into English by Anne-Lise Christensen. Golden developed standardized administration procedures and materials for Luria's tests, as well as scoring procedures to allow for quantitative analysis of results and comparisons with normative populations. Original validity studies suggested that the comprehensive Luria-Nebraska Neuropsychological Battery could validly discriminate between persons with and without brain damage.

At the current time, only one form of the Luria-Nebraska Neuropsychological Battery is available, for individuals ages 15 and up although Golden states that the battery has been used effectively with individuals as young as age 12. A version of the LNNB for children and a second version of the adult tests (LNNB Form II) are currently available.

The Luria-Nebraska Neuropsychological Battery is made up of 269 different items, most of which differ in some aspect from other items in the battery. The items make up 52 separate but not totally independent scales: 14 clinical scales, 8 localization scales, and 30 factor scales.

Test items are of varying complexity and degree of difficulty but, in general, each requires only a very short, limited response. Items also vary as to the mode of stimulus input and response output. For example, items might be presented to subjects orally, by written verbal directives, by visually presented designs, or tactually. Subjects also respond by different means including aurally, motorically, or by writing. Some tasks are speeded while others have no time limits.

The 269 items are divided into 11 clinical scales, derived from Luria's basic classification of his own items into broad categories. Each scale represents a complex area of neuropsychological functioning, including motor, rhythm, tactile, visual, receptive speech, expressive speech, writing, reading, arithmetic, memory, and intellectual functions. The following is a more detailed description of the LNNB scales.

**MOTOR FUNCTIONS.** This scale investigates a number of simple and complex motor functions. The first 4 items deal with simple, rapid movements of the fingers and hands. These tasks are timed and performed with both the left and right hands. The next set of items (4) deals with the ability to use tactile feedback to guide motor activity. The subject's hands and fingers are placed in certain positions while blindfolded. The subject must duplicate the position generated by the examiner. The next group of items (9-20) requires the subject to copy movements modeled by the examiner without verbal directives. Items 21 to 24 involve speeded, coordinated movements of both hands. Items 25 to 27 require the subject to pretend to carry out common, everyday activities, such as pouring and stirring a cup of tea. The next series of 8 items focuses on oral motor skills and included simple movements of the mouth and tongue, pretended movement, and coordination of oral movements, under speed conditions. Items 36 to 48 involve speed and accuracy in drawing common geometric figures (circle, square, triangle) from verbal and visual cues. The final 4 motor items require the subject to carry out various motor activities from spoken commands (e.g., "If I say red, squeeze my hand. If I say green, do nothing").

**RHYTHM SCALE.** Items on this scale address the ability to perceive and discriminate pitch, musical melodies, and reproduce tone, rhythm, and melody. All items except two require the subject to listen to recorded stimulus material from a cassette tape recorder. The first three items require the subject to discriminate between either two tones or two melodies, determining if they are the same or different. Items 55 to 57 require the subject to hum tones or sing lines from songs. The next set of items requires the subject to listen and count beeps played from the tape. The final two items require the subject to reproduce musical melodies by tapping rhythms with the hands.

**TACTILE SCALE.** This scale is administered while the subject is blindfolded. The subject is required to discriminate locus of touch on both hands, discriminate between sharp and dull touches and hard and soft touches, discriminate between one and two point stimulation at various widths, perceive designs, letters and numbers traced on the wrists, and reproduce standard arm positions placed by the examiner. The final items, number 62 to 85, involve stereognosis or the ability to tell by touch the name of four common objects placed in the hands. These final items are also timed.

**VISUAL (SPATIAL) SCALE.** This scale focuses upon visual perception, spatial orientation, and higher level spatially based problem solving. Items 86 to 91 require the subject to identify items in pictures which vary in complexity and clarity. Items 92 and 93 require analysis of complex visual patterns similar to the Raven's Progressive Matrices under time constraints. Items 94 to 96 involve the reading and drawing of clocks and the ability to detect direction using a compass. Items 97 to 99 involve higher level spatial reasoning and visualization skills. The subject is required to count the number of blocks in various three dimensional block sketches, and mentally rotate geometric figures in order to match them with similar figures, both under speeded conditions.

**RECEPTIVE SPEECH.** This scale addresses the subject's ability to understand the speech of others. Items 100 to 107 involve the ability to hear and reproduce speech sounds spoken by the examiner, either by speaking or writing the sound, and the ability to discriminate between similar speech sounds. Items 108 to 116 require comprehension of words and commands which vary in complexity (e.g., one-step commands, five-step commands) and in response modality (e.g., pointing to body parts, orally defining words). Items 117 to 132 focus on more complex aspects of language comprehension, including understanding conflicting instructions ("If it is day now, point to the black card, and if it is night now, point to the gray card"), and understanding logical grammatical structures ("Will you tell me whether the father's brother and the brother's father are two persons or the same person?"). These items are administered under speeded conditions.

**EXPRESSIVE SPEECH.** The Expressive Speech scale examines the subject's ability to use language to effectively express thoughts and ideas. The first 21 items (numbers 133 to 153) require the subject to articulate speech sounds and words from a spoken model or from a written stimulus. Items 154 to 156 require repetition of sentences. Naming and word finding abilities are tapped in Items 157 to 159. Fluency and automatization of speech are assessed in Items 160 to 163 (e.g., counting to 20, saying the days of the week backward). The ability to generate speech about various topics is addressed in Items 164 to 169. The ability to use complex rules of grammar in verbal expression is evaluated in Items 170 to 174.

**WRITING.** The Writing scale evaluates both motor writing and spelling tasks. Items 177-185 assess motor writing ability, copying, and spelling skills. Items 175 and 176 address phonetic skills and simple spelling skills, from a simple to moderately complex level (e.g., spelling "physiology"). Items 186 - 187 evaluate the subject's ability to write their ideas in a fashion that is grammatically accurate, with proper spelling and logical content.

**READING.** The Reading scale also assesses phonetic skills (Items 188-189), requiring the subject to describe sounds and words spelled out by the examiner (e.g., "What word is made by the letters 'k-n-i-g-h-t'"). Items 190 to 198 tap reading skills from the identification of letters to the oral reading of unfamiliar words (e.g., "astrocytoma"). Items 199-200 require the subject to read a brief paragraph orally, which is scored for both accuracy and speed.

**ARITHMETIC.** This scale assesses the fundamental aspects of mathematics, including basic number concepts, number reading, and number writing (Items 201 to 211) and the ability to solve simple arithmetic problems mentally and on paper (Items 212 to 217). Items 218 to 220 tap understanding of arithmetic operations and signs, and simple algebraic operations. The final 2 items assess the ability to perform serial subtractions under time constraints (Items 221, 222).

**MEMORY.** The Memory scale assesses different aspects of immediate recall and learning ability.

Items 223 to 225 require the subject to learn and repeat a series of seven words spoken at a one-per-second pace by the examiner. The task allows up to five presentations of the word list and requires two consecutive correct trials to reach criterion. Item 226 involves the ability to recognize a complex visual stimulus presented on a card for 5 seconds after a 30 second delay. Item 227 requires the subject to draw five geometric designs presented visually for 7 seconds after the visual stimulus is withdrawn. Items 228 to 230 require the recall of rhythmic patterns tapped on the tabletop, hand positions modeled by the examiner, and the repetition of five words presented on a card after a five-second exposure. Items 231 to 233 require word and sentence learning under conditions of interference, and Item 234 taps the ability to recall pertinent facts from an orally presented story. The final Memory scale, Item 236 assesses the ability to form and recall associations between words spoken by the examiner and pictures presented simultaneously to the subject.

**INTELLECTUAL PROCESSES SCALE.** This scale provides a brief assessment of intellectual and conceptual functions with items similar to those found in more extensive intelligence tests. Items 236 and 237 require the subject to verbally explain the activities presented in pictures. Items 238 to 240 are picture arrangement tasks similar to those found on the WAIS, requiring the sequential logical ordering of picture series under time constraints. Items 242 and 243 assess the subject's ability to interpret abstract humor from cartoon drawings. Items 244 to 248 parallel the first 8 items, but are presented aurally rather than pictorially (e.g., "What is meant by the saying, "Don't count your chickens before they have hatched?"). Items 249 and 250 assess similarities and differences between objects, and Items 251 and 254 assess the ability to comprehend logical relationships (e.g., "If we start with the part "wall" then the whole will be "house". What will the whole be if the parts are pages?"). Items 255 to 257 assess concepts including opposites and analogies. The final 12 items (258 to 269) assess the ability of the subject to perform mental arithmetic word problems under speeded conditions.

In addition to the 11 clinical scales, a pathognomonic scale, and right and left hemisphere sensorimotor scales, made up of items contained in other scales, are included. Scores on 8 empirically derived localization scales (left and right frontal, sensorimotor, parietal-occipital, and temporal lobe scales), and 30 factor scales which allow for more detailed analysis of functions within broad neuropsychological categories are also obtained.

Following is a list of the LNNB factor scales.

M1	Kinesthetic-based Movements
M2	Drawing Speed
M3	Fine Motor Speed
M4	Spatial-based Movement
M5	Oral Motor Skills
Rh1	Rhythm and Pitch Perception
T1	Simple Tactile Sensation
T2	Stereognosis
V1	Visual Acuity and Naming
V2	Visual-Spatial Organization
Rc1	Phonemic Discrimination
Rc2	Using Relational Concepts
Rc3	Concept Recognition
Rc4	Verbal-Spatial Relationships
Rc5	Word Comprehension
Rc6	Logical Grammatical Relations
E1	Simple Phonetic Reading
E2	Word Repetition
E3	Reading Polysyllabic Words
Rg1	Reading Complex Material
Rg2	Reading Simple Material
W1	Spelling
W2	Motor Writing Skills
A1	Arithmetic Calculations
A2	Number Reading
Me1	Verbal Memory
Me2	Visual And Complex Memory
I1	General Verbal Intelligence
I2	Complex Verbal Arithmetic
I3	Simple Verbal Arithmetic



## Attention Tests

**DIGIT VIGILANCE TEST.** The Digit Vigilance test is a cancellation task consisting of two pages, containing 59 rows of 39 digits. The individual is asked to mark or cross out the number 6. The test is scored for total time and errors of omission. It is sensitive to perceptual speed, visual scanning, and neglect.

**PERCEPTUAL SPEED.** This cancellation task differs from others in that the target shifts with each line. The test consists of two pages of 25 rows of 30 randomized digits. The first digit in a line is the target digit. The PS measures both speed of visual tracking and ability to shift attention.

**PACED AUDITORY SERIAL ADDITION TEST (PASAT).** This sensitive test simply requires the individual to add 60 pairs of randomized digits so that each is added to the digit immediately preceding it. For example, if the examiner reads the numbers "2-8-6-1-9," the subject's correct responses beginning as soon as the examiner says "8", are "10-14-7-10." The digits are presented at four rates of speed, each differing by 0.4 seconds and ranging from one every 1.2 seconds to one every 2.4 seconds. Precision control over the rate at which digits are read requires a taped presentation. Every effort is made to ensure that the individual understands the instructions. This measure is sensitive to deficits in information processing ability. It also measures the individual's ability to sustain attention and response to frustration.

**THE STROOP COLOR-WORD TEST.** This is a measure of concentration and mental control which requires the subject to label colors of print which spell out conflicting names of colors. Raw scores are obtained for 45-second preliminary reading and naming trials, and for 45-second interference trial. An interference score is also calculated.

**MATCHING FAMILIAR FIGURES TEST (MFFT).** The test is essentially a measure of impulsivity. Subjects are required to select the two matching figures from a series of six figures. Quick response times suggest impulsivity and inattention to detail.

**DIVIDED ATTENTION.** This task requires a subject to attend to two different response sets simultaneously (for example remembering a numerical series while identifying each digit as even or odd). Mental flexibility and auditory attention are assessed.

**CONTINUOUS PERFORMANCE TEST (CPT).** This task measures the capacity to sustain attention or concentration. Letters are randomly presented on a micro-computer monitor at the rate of one every two seconds. Whenever a target stimulus appears after a designated stimulus (e.g., "X" following a "T"), the subject must depress the computer keyboard space bar as quickly as possible. The task is given under two different conditions: a) nondistracting, and b) distracting. In the nondistracting condition, the subject responds only to the stimuli ("X" following a "T"). In the distractor condition the subject must

ignore randomly interspersed auditory tones of varying duration and frequency generated from the computer. This latter task is particularly useful for clarifying if there is a susceptibility to distraction. Each part takes 15 minutes.

## Memory Tests

**RIVERMEAD BEHAVIOURAL MEMORY TEST.** This test was developed to detect impairment in everyday memory functioning and has been used to monitor change following treatment for memory difficulties. The items involve either remembering to carry out some everyday task or retaining the type of information needed for adequate everyday functioning (e.g., remembering a name, appointment, face). These items are combined with conventional memory measures such as digit span, logical memory and paired associate learning. Four versions of the RBMT are available to reduce the practice effects of repeated testing.

### **WECHSLER MEMORY SCALE - REVISED (WMS-R).**

**Logical Memory:** The logical memory test of the Wechsler Memory Scale - Revised involves the examiner reading two paragraphs, stopping after each reading for the individual to give his or her immediate free recall of the story. Between 20 and 30 minutes later, and following administration of other tests, the individual is asked to recall and state everything they can remember about the stories in order. This test is a sensitive measure of verbal learning, involving acquisition, encoding, and retrieval. Recognition memory is also evaluated.

**Visual Reproduction:** This is a test of immediate and delayed memory for geometric designs. The subject is shown a geometrical figure for ten seconds and then asked to draw what they can remember upon removal of the design. Following a 20 to 30 minute delay and the administration of other tests, the subject draws what he or she remembers of the designs. It is a sensitive measure of visual memory involving acquisition, encoding, and retrieval. Comparison of performance on visual reproduction with logical memory is commonly used to determine the integrity of visual versus verbal learning capacities and right versus left cerebral hemisphere.

**CALIFORNIA VERBAL LEARNING TEST (CVLT).** This memory test assesses recall of word lists under a variety of conditions including free recall, interference, categorical cues and delayed recall.

## Language Tests

**BDAE NAMING AND FLUENCY TASKS.** These tasks require the subject to name various items from visual and verbal cues, repeat phrases, and generate words from specified categorical areas such as words beginning with a designated letter or kinds of animals. The

tests are taken from the Boston Diagnostic Aphasia Examination.

**TOKEN TEST.** The Token Test involves presenting a display of colored tokens of various colors and shapes and asking the subject to follow instructions for manipulating the tokens (e.g., "Put the red circle on the green square"). The test is a measure of attention and comprehension of spoken language.

## **Visual Perceptual Tests**

**COMPLEX FIGURE TEST (CFT).** The CFT is a complex drawing task in which the subject is required to copy a figure consisting of 18 scoreable components. The test is untimed but time to complete is recorded. Data are available on normal adult performance. Each of 18 components are scored from 2 (correct and properly placed) to 0 (absent or not recognizable). A maximum of 36 points is attainable. The procedure usually takes less than 10 minutes to administer.

**JUDGMENT OF LINE ORIENTATION.** This test examines the ability to estimate angular relationships between line segments by visually matching angled line pairs in 11 numbered radii forming a semi-circle. Two forms of the test are available.

**REY OSTERREITH COMPLEX FIGURE.** The Rey-Osterreith is used to investigate both perceptual organization and visual memory. The subject is first instructed to copy the complex figure, which has been set out so that its length is along the subject's horizontal plane. The examiner watches the subject's performance closely; noting and recording the sequence of completion. Upon completion, the subject is asked to draw what he or she can remember of the figure from memory immediately and again approximately 40 minutes later. Various types of errors are commonly associated with different types of brain impairment. Visual spatial organization, constructional capacities, and organizational and planning skills are interpreted.

**TEST OF FACIAL RECOGNITION.** This test was developed to examine the ability to recognize faces without involving a memory component. The subject matches identical front views, front with side views and front views taken under different lighting conditions. Administration time ranges from 10-20 minutes depending on subject's response rate and cautiousness in making choices.

**VISUAL FORM DISCRIMINATION.** This test examines the ability to match complex geometric patterns. Subject responses are scored as correct, peripheral error, major rotation or a major distortion.

**HOOPER VISUAL ORGANIZATION TEST.** This is a test requiring conceptual reorganization of disarranged pieces. This test is comprised of thirty pictures of more or less readily recognizable cut-up objects. The subject is asked to name each object verbally or

by writing the name of the object on the test booklet.

### **Problem Solving Tests**

**SYMBOL DIGIT MODALITIES TEST.** A substitution task in which the subject must fill in as rapidly as possible numbers for geometric symbols in conformity with a code provided. Although similar to the WAIS Digit Symbol subtest, it is normed for brain damaged and non-brain damaged patients and involves substitution of numbers for symbols rather than the reverse. This test may also be given orally by having a subject call out the numbers.

**PORTEUS MAZES.** The maze tracing task was designed to yield data about the highest levels of mental functioning involving planning and foresight. There are three sets of the Porteus Maze Test to compensate for practice effects in retesting. To achieve a successful trial, the subject must trace the maze without entering any blind alleys.

**WISCONSIN CARD SORTING TEST (WCST).** The WCST is a test devised to study abstract thinking and the ability to shift mental sets. The subject is given a pack of 64 cards on which are printed one of four symbols, triangle, star, cross, or circle, in red, green, yellow, or blue. No two cards are identical. The subject's task is to place them one by one under four stimulus cards - one red triangle, two green stars, three yellow crosses, and four blue circles - according to a principle that the subject must determine from the pattern of the examiner's response to the placement of the cards. The examiner shifts between principles based upon concepts of form, color, and number. Scoring is the number of correct categories achieved by using a pack of 128 cards. The number of perseverative responses may also be scored. This score is useful in documenting problems in forming concepts, profiting from correction, and conceptual flexibility.