DOWNLOAD PDF RELIABILITY AND VALIDITY IN NEUROPSYCHOLOGICAL ASSESSMENT

Chapter 1 : Neuropsychological Assessment Studies :: The Transitional Learning Center

Validity is a term that is often invoked in decisions to use neuropsychological tests. Unfortunately, the context of this use is usually negative, as when a test is cited as invalid.

Forms 1 and 2 of the NAB Naming Test demonstrated adequate internal consistency and alternate forms reliability. The NAB Naming Test was significantly associated with scores from the BNT, as well as scores from tests that assess visuospatial skills, semantic fluency, and verbal memory. The divergent validity of the NAB Naming Test was demonstrated by non-significant associations with tests of attention and processing speed. BNT scores correlated significantly with the educational level and estimated premorbid intelligence but not age, whereas the NAB Naming Test scores only correlated significantly with estimated premorbid intelligence. The current study provides independent validation supporting the utility of the NAB Naming Test for patients with acquired brain injury. The internal consistency for each form of the NAB Naming Test averaged across age group was found to be adequate form 1: Yochim and colleagues reported that the magnitude of the correlation coefficients between scores from the NAB Naming Test and the BNT was significantly greater than that of the correlation coefficients between scores from the NAB Naming Test and neuropsychological tests assessing memory and visuospatial skills, supporting the convergent validity of the NAB Naming Test. As for divergent validity, they reported that neither form of the NAB Naming Test correlated significantly with less related measures such as those that assess processing speed or verbal abstraction. Overall, their findings were relatively consistent with the reliability and validity coefficients provided from the NAB standardization data using a non-clinical sample. The aim of the current study was to provide an independent analysis of the reliability and validity of the NAB Naming Test in a sample of patients with acquired brain injury. To date, there is a limited validation of the NAB Naming Test using a neurologically impaired sample of patients, particularly those with brain injury. It is hypothesized that a the internal consistency and alternate forms reliability of the NAB Naming Test in our sample will be consistent with the NAB standardization data and prior independent analyses; b the convergent validity of the NAB Naming Test will be established by its associations with the BNT and other tests of neuropsychological functioning that appear to be related to visual confrontation naming e. Lastly, the current study explored the relationship between demographic variables e. Participants were included only if they had adequate visual and auditory acuity, preserved auditory comprehension skills, and English as their primary language. Exclusion criteria included history of a prior neurological disorder, psychiatric disorder, learning disability, or longstanding alcohol or illicit substance abuse. None of the study patients were in litigation for the purposes of remuneration for their injuries. All procedures were approved by an institutional review board. The mean age of the sample was The ethnic breakdown of the sample was 44 Caucasian, 10 Hispanic, and 5 African American. Thirty-six participants sustained a traumatic brain injury secondary to motor vehicle accident, gunshot wound, or fall and 23 participants experienced a non-traumatic brain injury secondary to cerebrovascular accident. The mean interval between injury onset and study test administration was 0. All but three patients 7. The current test battery included the following: The test battery was administered during a single testing session and each participant completed all tests. Administration of all tests adhered to the standardized procedures. Descriptive data for neuropsychological test raw scores by cognitive domain.

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Chapter 2 : Reliability and Validity in Neuropsychological Assessment - Michael D. Franzen - Google Book

No other book reviews clinical neuropsychological assessment from an empirical psychometric perspective. In this completely revised and updated 2nd edition, the concepts and methods of psychometric neuropsychology are presented as a framework by which to evaluate current instruments.

This article has been cited by other articles in PMC. Abstract Introduction The Repeatable Battery for the Assessment of Neuropsychological Status RBANS is a widely used screening instrument in neuropsychological assessment and is a brief, individually administered measure. The present study aims to assess the reliability and validity of the Chinese version of the RBANS in community-dwelling elderly. Material and methods All subjects come from the community-dwelling elderly in Shanghai, China. A confirmatory factor analysis CFA was conducted to test the construct validity. Results The final sample of participants included community-dwelling elderly. It may be a useful screening instrument for conducting cognitive assessments in community-dwelling elderly. Repeatable Battery for the Assessment of Neuropsychological Status, reliability, validity, neuropsychological assessment, the elderly Introduction The assessment of cognitive change is an important task for neuropsychologists, especially those working in geriatric settings [1]. Cognitive impairment is a common and significant feature of the elderly [2]. The ability to identify stability or improvements in cognitive function is a valuable clinical skill [3]. Cognitive assessment is widely used for three types of indications: An instrument that could be used to screen for cognitive status and to provide information about prognosis in the elderly would be of great value. However, the cognitive assessment of geriatric individuals is often associated with a variety of difficulties [5]. For instance, older adults are more prone to fatigue [5]. A wide range of tools has been developed for cognitive assessment [3]. These vary from brief screening tools that take less than 1 min to complete to professional neuropsychological assessments that take several hours [3]. The appropriate choice of tools depends on the time available and the purpose of the assessment [3]. It consists of 12 subtests, most of which are similar to individual neuropsychological measures [5]. The instrument takes some of the difficulties inherent in the assessment of older adults into account [5]. In this way, the RBANS has the benefit of being brief and tolerable to complete as compared with other neuropsychological batteries, while providing more detailed information than many other screening measures such as the Dementia Rating Scale. The normative information for the RBANS provided in the manual is a US nationwide, population-based standardization with adults aged from 20 to 89 years old [5]. It has been demonstrated to be a valid and reliable instrument for detecting cognitive deficits across a range of age levels and diagnostic groups [5]. In China, the largest developing country in the world, aging has become a social problem. Therefore, a practical measure for cognitive assessment has wide potential use. It has been proven that level of education would account for a statistically significant portion of the variance across performance on the RBANS and the individual indices [8 â€” 10]. The mean education level in developing countries is lower than that in developed countries. Thus, we need to present data confirming the reliability and validity of the RBANS in community-dwelling elderly in China to support the wide application of this instrument in China in the future. Material and methods This study received ethics approval from the Ethics Committee of Tongji Hospital. Participants The original data set consisted of community-dwelling elderly residing near Tongji Hospital in Shanghai. Thirty-one individuals were excluded from the study because of physical deficits e. Twenty-seven subjects failed to follow up because of withdrawal from the study, moves to other locations, incorrect telephone numbers, or death. Six questionnaires were unable to be used because of incomplete information. The final sample of participants included community-dwelling elderly Figure 1.

Chapter 3 : Reliability and validity in neuropsychological assessment â€" University of Minnesota Press

properties of clinical neuropsychological assessment instruments has assumed a more prominent position and a higher priority than it held previously. The psychometric evaluation of assessment instruments is a continual activity.

The NCPT platform is modular and includes 18 subtests that can be arranged into customized batteries. Here we present normative data from a sample of , healthy volunteers for an NCPT battery consisting of 8 subtests. Participants took the NCPT remotely and without supervision. Factor structure and effects of age, education, and gender were evaluated with this normative dataset. Test-retest reliability was evaluated in a subset of participants who took the battery again an average of The eight NCPT subtests group into 4 putative cognitive domains, have adequate to good test-retest reliability, and are sensitive to expected age- and education-related cognitive effects. Concurrent validity to standard neuropsychological tests was demonstrated in 73 healthy volunteers. Overall these results demonstrate the reliability and validity of the NCPT battery as a measure of cognitive performance and support the feasibility of web-based, unsupervised testing, with potential utility in clinical and research settings. Introduction Neuropsychological assessments are designed to measure cognitive functions in both healthy and clinical populations and remain important tools for research studies, clinical diagnoses, patient outcomes, and intervention monitoring Wild et al. The high cost and time commitment associated with this type of testing may serve as a barrier to optimized patient care and more efficient research. Computerized administration of clinical instruments is not an entirely new phenomenon and the application of computers to the evaluation of cognition has been studied previously Wild et al. With advances in technology, computerized neuropsychological tests cNPTs have been able to address several shortcomings of conventional testing methods Wild et al. Key advantages of cNPTs over pencil-paper assessments include: In their relatively short history, cNPTs have proven advantageous compared to pencil-paper neuropsychological tests, lowering the cost of testing, and expanding their utility and potential applications. During recent years many cNPTs have been developed for a recent review see Zygouris and Tsolaki, At a minimum, cNPTs should provide a set of tests with a range of assessment capabilities that are consistent with a well-defined purpose Schlegel and Gilliland, In addition, cNPTs must have supporting data to demonstrate response characteristics, reliability, and validity similar to traditional pencil-paper assessments or other validated cNPTs Schlegel and Gilliland, Data from several peer-reviewed, published reports have supported the validity, reliability, and feasibility of the use of cNPTs in both clinical and research settings e. To date, the platform includes 18 subtests that are online adaptations of widely used conventional neuropsychological tests. The NCPT is being developed as an assessment tool applicable to a broad population. In clinical research, the NCPT could have specific utility as a screening tool for entering participants into trials, or as an outcome measure to support efficacy; in clinical settings it could aid in the diagnosis of cognitive impairment and monitor cognitive change over time. The NCPT platform is modular and the subtests can be arranged into customized batteries. Here we present normative data for more than , individuals aged 13â€"89 years from a NCPT battery that includes 8 subtests and several analyses to demonstrate reliability and validity of the NCPT battery as a measure of cognitive performance. In addition, data from participants who self-reported cognitive impairment was used to test the ability of the NCPT battery to differentiate clinical populations from healthy ones, demonstrating potential utility in research and clinical settings. Methods and Results Ethical Statement Since these studies evaluated performance on cognitive assessments and did not include an intervention they were exempt from IRB review. Participants were informed prior to starting the assessment see Section Participants and Normative Data below that their data would be used for research purposes, and opted in by choosing to take the assessment or not. Participants and Normative Data Data used to generate the normative database were derived in aggregate from Lumosity subscribers who took the NCPT as part of their user experience. The majority of these users had paid for a premium Lumosity subscription. Within 1 week of their initial sign-up, Lumosity users were invited via email and an in-app prompt to take the NCPT battery time 1. Normative data

were derived from a sample of , individuals aged 13â€”89 years who were generally healthy as assessed via self-report survey and had taken the NCPT battery at least once Normative Sample. Participants in the Normative Sample represented countries, with the majority from the United States Following completion of the NCPT battery at time 1, participants were asked to report if they had ever been diagnosed with a variety of clinical conditions. Anyone reporting a clinical diagnosis was excluded from the Normative Sample. Assessment scores were grouped into 5-year age bins except for 13â€”19 and 80â€”89 and scaled as described below see Section Scoring. Analyses to evaluate inter-assessment correlations, factor structure, and effects of age, education, and gender were performed using the Normative Sample. Lumosity users who took the NCPT battery at time 1 were then invited 70 days later via a follow-up email and an in-app prompt to take the NCPT battery a second time time 2. Throughout this period, participants could freely play a variety of cognitive training games as part of their Lumosity subscription. A total of 35, users Pre-Post Sample took the NCPT battery at both time points and these data were used to evaluate test-retest reliability. In order to generate a complete normative database and conduct the appropriate analyses, only data for participants who completed all subtests of the NCPT in a single session were included in the Normative and Pre-Post Samples. Finally, in a separate study that included 73 young healthy adults, concurrent validity for five of the eight NCPT subtests to their corresponding pencil-paper neuropsychological tests was evaluated. All analyses were conducted in R R Core Team, Demographic characteristics for all participants are summarized in Table 1. Demographic characteristics of the groups studied. The Neurocognitive Performance Test Development In general, NCPT subtests are based on existing pencil-paper assessments where shifting to computerized administration would not negatively impact the test mechanic. The process for developing NCPT subtests consists of six stages, as follows: A specific cognitive function or domain is highlighted as an area of focus for a new subtest. Based on review of the neuroscience and neuropsycology literature, a team of scientists at Lumos Labs evaluates existing neuropsychological assessments in the designated area to identify a currently existing assessment, or the fundamental components required for testing in the designated area. The resulting NCPT subtest may be a direct computerized, web-based replication of an existing paper-pencil test assuming it is open-access , like the Trail Making Test; or it may based on an existing test but not an exact replication, like Progressive Matrices. A software engineer develops a beta version of the subtest. The specification includes background information, objective, design mockups, including for a tutorial, copy for instructions, test mechanics e. The development process includes several rounds of back and forth between the developer and the scientist in an iterative process of development and quality assurance QA testing. The beta version undergoes quality assurance testing. When the final beta version of the subtest is approved by the scientist, QA testing proceeds, which may result in suggested changes. Suggested changes are reviewed by the scientist and implemented, if applicable. QA testing is deemed complete when no further suggestions are received. The beta version then undergoes user testing. When the beta version of the subtest is ready, it undergoes user testing in one of two ways: The subtest is included in an online test-retest reliability study: A subset of Lumosity users are invited via email to take the new subtest twice, approximately 2 weeks apart. These experiments run for a few months, with hundreds of users completing the subtest at both timepoints. Beta versions of subtests are not included in the calculation of the Grand Index score. This testing method generates vast amounts of performance data quickly, as all Lumosity subscribers are invited to take the NCPT within the first week of their subscription and then again 70 days later. User test data is analyzed. After enough data is gathered, Lumos Labs scientists analyze score distributions and psychometric properties such as test-retest reliability. The subtest is released. If the subtest shows good score distribution, test-retest reliability, and correlation with other subtests, then it is considered complete and made available for inclusion in NCPT batteries. If any of these metrics are unsatisfactory, scientists and developers will work to make improvements; it will then be tested again in Step 4. If the improvements do not address the shortcomings, the assessment is dropped. Content for the NCPT is algorithmically generated. The algorithm for each subtest is based on individual subtest specifications resulting in numerous, randomly generated alternate forms and offering the possibility of retesting any number

of times without repeating the exact content. The target frame rate is 30 frames per second. The Flash file for each subtest loads individually before beginning the subtest and data is sent at the conclusion of each subtest. The NCPT is optimized for administration in an unsupervised environment on desktop or laptop computers with Internet connectivity. Internet connectivity is required for subtest loading and data transmission, but not for the active test taking. For each subtest, users must successfully complete a tutorial and practice session before they are able to move on to the assessment to ensure they understand the task requirements. Scoring Each NCPT subtest is scaled following a percentile rank-based inverse normal transformation, a protocol used in well-accepted measures of cognitive ability such as the Wechsler Adult Intelligence Scale Wechsler, Normative tables are created for each NCPT subtest. Each of these tables provides the corresponding scaled score for each observed raw score by 5-year age bin. To create these age-binned normative tables, the raw score from each subtest e. The position of that percentile on a normal distribution is used to convert the raw score to a scaled score where the distribution has a mean of and a standard deviation of An example of normalization using the Trail Making A subtest is shown in Figure 1. Score distributions for Trail Making A before left and after right the normalization procedure. Each NCPT subtest is scaled following a percentile rank-based inverse normal transformation. These scaling procedures provide the benefit of having all scaled scores derived from an NCPT battery each subtest scaled score and the Grand Index on the same normal distribution that has a mean of and a standard deviation of Subtests The NCPT battery used in these analyses is relatively brief, taking between 20 and 30 min to complete, and includes 8 subtests, as follows: The primary measure is number of correct responses minus number of incorrect responses in 45 s. The subtest lasts 90 s and participants are required to match a series of numbers that correspond to randomly generated symbols. The primary measure is number of correct responses minus number of incorrect responses. These subtests require participants to recall a sequence of randomized spatial locations in either forward or reverse order. The subtest concludes when three consecutive errors on one sequence length are made. The primary measure is number correct. The subtest lasts 45 s and requires participants to rapidly and accurately evaluate potentially confusing grammatical statements. The subtest lasts up to 17 trials, or concludes when three consecutive errors are made. The primary measure is number of correct responses. In Trail Making A participants are required to click on a sequential series of encircled numbers from 1 to Task requirements are similar for Trail Making B except the circles include both numbers and letters and the participant must alternate sequentially between numbers and letters. For both Trail Making A and B, the primary measure is completion time there is no time limit. Normative Sample Supplementary Table 1 describes the gender, race, education level, household income level, and handedness for each 5-year age bin in the Normative Sample. Participants who took the NCPT battery at time 1 had a mean age of

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Concurrent validity of NCPT subtests to corresponding pencil-paper assessments was determined in a study in which participants were equally randomized (i.e.,) to receive the NCPT followed by a pencil-paper neuropsychological test battery of corresponding assessments (or vice versa) in a single session.

In their report, the subcommittee recommended that the conceptual model of psychological abilities required for work, as currently used by SSA through the MRFC assessment, be revised to redress shortcomings and be based on scientific evidence. The subcommittee identified four major categories of psychological functioning essential to work: Each of these functional domains would also be relevant areas of assessment in children applying for disability support. As indicated below, there are standardized measures that have been well normed and validated for pediatric populations. Interpretation of test results in children is more challenging, as it must take into account the likelihood of developmental progress and response to any interventions. Thus, the permanency of cognitive impairments identified in childhood is more difficult to ascertain in a single evaluation. Page Share Cite Suggested Citation: Psychological Testing in the Service of Disability Determination. The National Academies Press. It was beyond the scope of this committee and report to identify and describe each available standardized measure; thus, only a few commonly used tests are provided as examples for each domain. The choice of examples should not be seen as an attempt by the committee to identify or prescribe tests that should be used to assess these domains within the context of disability determinations. For a more comprehensive list and review of cognitive tests, readers are referred to the comprehensive textbooks, Neuropsychological Assessment Lezak et al. Intellectual disability affects functioning in three domains: Language and Communication The domain of language and communication focuses on receptive and expressive language abilities, including the ability to understand spoken or written language, communicate thoughts, and follow directions American Psychiatric Association, ; OIDAP, The mental functions of language include reception of language i. Abilities related to communication include receiving and producing messages spoken, nonverbal, written, or formal sign language , carrying on a conversation starting, sustaining, and ending a conversation with one or many people or discussion starting, sustaining, and ending an examination of a matter, with arguments for or against, with one or more people , and use of communication devices and techniques telecommunications devices, writing machines WHO, In a survey of historical governmental and scholarly data, Ruben found that communication disorders were generally associated with higher rates of unemployment, lower social class, and lower income. A wide variety of tests are available to assess language abilities; some prominent examples include the Boston Naming Test Kaplan et al. Learning and Memory This domain refers to abilities to register and store new information e. However, it is important to note that semantic, autobiographical, and implicit memory are generally preserved in all but the most severe forms of neurocognitive dysfunction American Psychiatric Association, ; OIDAP, Attention and Vigilance Attention and vigilance refers to the ability to sustain focus of attention in an environment with ordinary distractions OIDAP, Normal functioning in this domain includes the ability to sustain, shift, divide, and share attention WHO, Persons with impairments in this domain may have difficulty attending to complex input, holding new information in mind, and performing mental calculations. They may also exhibit increased difficulty attending in the presence of multiple stimuli, be easily distracted by external stimuli, need more time than previously to complete normal tasks, and tend to be more error prone American Psychiatric Association, Tests for deficits in attention and vigilance include a variety of continuous performance tests e. This domain reflects mental efficiency and is central to many cognitive functions NIH, n. Executive Functioning Executive functioning is generally used as an overarching term encompassing many complex cognitive processes such as planning, prioritizing, organizing, decision making, task switching, responding to feedback and error correction, overriding habits and inhibition, and mental flexibility American Psychiatric Association, ; Elliott, ; OIDAP, Patients with such impairments will often have difficulty

completing complex, multistage projects or resuming a task that has been interrupted American Psychiatric Association, Because executive functioning refers to a variety of processes, it is difficult or impossible to assess executive functioning with a single measure. The majority of cognitive tests have normative data from groups of people who mirror the broad demographic characteristics of the population of the United States based on census data. As a result, the normative data for most measures reflect the racial, ethnic, socioeconomic, and educational attainment of the population majorities. Unfortunately, that means that there are some individuals for whom these normative data are not clearly and specifically applicable. This does not mean that testing should not be done with these individuals, but rather that careful consideration of normative limitations should be made in interpretation of results. Selection of appropriate measures and assessment of applicability of normative data vary depending on the purpose of the evaluation. Clearly, each of these purposes could be relevant for SSA disability determinations. However, each of these instances requires different interpretation and application of normative data. Unfortunately, it is rare that an individual has a formal assessment of his or her premorbid cognitive functioning. Thus, comparison of the postinjury performance to demographically matched normative data provides the best comparison to assess a change in functioning Freedman and Manly, ; Heaton et al. In many instances, this type of data is provided in alternative normative data sets rather than the published population-based norms provided by the test publisher. In this situation, use of otherwise appropriate standardized and psychometrically sound performance-based or cognitive tests is appropriate. To make this determination, the most appropriate comparison group for any individual would be other individuals who are currently completing the expected vocational tasks without limitations or disability Freedman and Manly, Unfortunately, there are few standardized measures of skills necessary to complete specific vocational tasks and, therefore, also no vocational-specific normative data at this time. Until such specific vocational functioning measures exist and are readily available for use in disability determinations, objective assessment of cognitive skills that are presumed to underlie specific functions will be Page Share Cite Suggested Citation: Despite limitations in normative data as outlined in Freedman and Manly , formal psychometric assessment can be completed with individuals of various ethnic, racial, gender, educational, and functional backgrounds. Use of appropriate standardized measures by appropriately qualified evaluators as outlined in the following sections further mitigates the impact of normative limitations. Interpretation requires assigning some meaning to the standardized score within the individual context of the specific test-taker. There are several methods or levels of interpretation that can be used, and a combination of all is necessary to fully consider and understand the results of any evaluation Lezak et al. This section is meant to provide a brief overview; although a full discussion of all approaches and nuances of interpretation is beyond the scope of this report, interested readers are referred to various textbooks e. One example of an interpretative approach would be that a performance within one standard deviation of the mean would be considered broadly average. Performances one to two standard deviations below the mean are considered mildly impaired, and those two or more standard deviations below the mean typically are interpreted as being at least moderately impaired. This type of comparison allows for identification of a pattern of strengths and weaknesses. However, if there is significant variability in performances across domains, then a specific pattern of impairment may be indicated. Profile Analysis When significant variability in performances across functional domains is assessed, it is necessary to consider whether or not the pattern of functioning is consistent with a known cognitive profile. That is, does the individual demonstrate a pattern of impairment that makes sense or can be reliably explained by a known neurobehavioral syndrome or neurological disorder. For example, an adult who has sustained isolated injury to the temporal lobe of the left hemisphere would be expected to demonstrate some degree of impairment on some measures of language and verbal memory, but to demonstrate relatively intact performances on measures of visual-spatial skills. This pattern of performance reflects a cognitive profile consistent with a known neurological injury. Conversely, a claimant who demonstrates impairment on all measures after sustaining a brief concussion would be demonstrating a profile of impairment that is inconsistent with research data indicating full cognitive recovery

within days in most individuals who have sustained a concussion McCrea et al. Interpreting Poor Cognitive Test Performance Regardless of the level of interpretation, it is important for any evaluator to keep in mind that poor performance on a set of cognitive or neuropsychological measures does not always mean that an individual is truly impaired in that area of functioning. In instances of inconsistent or unexpected profiles of performance, a thorough interpretation of the psychometric data requires use of additional information. To answer the latter question, administration of performance validity tests PVTs as part of the cognitive or neuropsychological evaluation battery can be helpful. Interpretation of PVT data must be undertaken carefully. Particular attention must be paid to the limitations of the normative data available for each PVT to date. As such, a simple interindividual interpretation of PVT testing results is not acceptable or valid. Rather, consideration of intraindividual patterns of performance on various cognitive measures is an essential component of PVT interpretation. PVTs will be discussed in greater detail later in this chapter. Qualifications for Administering Tests Given the need for the use of standardized procedures, any person administering cognitive or neuropsychological measures must be well trained in standardized administration protocols. He or she should possess the interpersonal skills necessary to build rapport with the individual being tested in order to foster cooperation and maximal effort during testing. Additionally, individuals administering testing should understand important psychometric properties, including validity and reliability, as well as factors that could emerge during testing to place either at risk as described in Chapter 3. Many doctoral-level psychologists are well trained in test administration. In general, psychologists from clinical, counseling, school, or educational graduate psychology programs receive training in psychological test administration. However, the functional domains of emphasis in most of these programs include intellectual functioning, academic achievement, aptitude, emotional functioning, and behavioral functioning APA, Neuropsychologists are clinical psychologists trained in the science of brain-behavior relationships. The clinical neuropsychologist specializes in the application of assessment and intervention principles based on the scientific study of human behavior across the lifespan as it relates to normal and abnormal functioning of the central nervous system. HNS, That is, a neuropsychologist is trained to evaluate functioning within specific cognitive domains that may be affected or altered by injury to or disease of the brain or central nervous system. For example, a claimant applying for disability due to enduring attention or memory dysfunction secondary to a TBI would be most appropriately evaluated by a neuropsychologist. They do not practice independently, but rather work under the close supervision and direction of doctoral-level clinical psychologists. Qualifications for Interpreting Test Results Interpretation of testing results requires a higher degree of clinical training than administration alone. Most doctoral-level clinical psychologists who have been trained in psychometric test administration are also trained in test interpretation. As stated in the existing SSA n. The reason for the evaluation, or more specifically, the type of claim of impairment, may suggest a need for a specific type of qualification of the individual performing and especially interpreting the evaluation. As stated in existing SSA n. More specifically, clinical neuropsychologists have been trained to interpret more complex and comprehensive cognitive or neuropsychological batteries that could include assessment of specific cognitive functions, such as attention, processing speed, executive functioning, language, visual-spatial skills, or memory. The standardization of neuropsychological tests allows for comparability across test administrations. As discussed in detail in Chapter 2 , a number of studies have examined potential for malingering when there is a financial incentive for appearing impaired, suggesting anywhere from 19 to 68 percent of SSA disability applicants may be performing below their capability on cognitive tests or inaccurately reporting their symptoms Chafetz, ; Chafetz et al. However, an individual may put forth less than optimal effort due to a variety of factors other than malingering, such as pain, fatigue, medication use, and psychiatric symptomatology Lezak et al.