Preparing Neuropsychologists for the Future: The Need for Additional Training Guidelines

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New guidelines for training in neuropsychology are needed for several reasons: increased diagnostic accuracy of neuroradiologic techniques; an increasing need for functional neuropsychological evaluations; emergence of other psychological specialties; and managed care/economic factors. Current INS-Division 40 guidelines emphasize neurological and diagnostic areas with minimal suggestions for training in rehabilitation and functional issues. The recent publication of training guidelines for Rehabilitation Psychology (APA Division 22) illustrates weaknesses in Division 40 training. It is proposed that neuropsychological training guidelines (formal guidelines and informal training experiences) incorporate another content area for training and demonstration of competency, defined as Functional Outcomes. Specific training is suggested in: (a) issues in disability; (b) ecological validity of tests; (c) vocational evaluation/training; (d) academic programs for students with disabilities; (e) independent living resources; (f) specific cognitive-behavioral interventions; (g) resources for individuals with disabilities; and (h) government assistance programs for individuals with disabilities. © 1997 National Academy of Neuropsychology. Published by Elsevier Science Ltd

INTRODUCTION

The history of neuropsychology has been well chronicled, and it can easily be argued that the origin of the field is based in the diagnosis of brain dysfunction and the determination of brain-behavior relationships (Hartmann, 1988, 1991; Loring, 1991). Given that neuroradiological techniques were not clinically utilized until the 1970s, neuropsychological evaluations until that time were necessary for making diagnostic inferences related to anatomical lesions and cerebral disorders. Although advanced neuroradiological tests (e.g., CT, MRI, SPECT, PET, etc.) have lead to a diminished need for solely diagnostic neuropsychological evaluations, most current methods of evaluation (pattern of performance, identification of pathognomonic signs, determination of cognitive "process") continue to use tests originally developed to determine brain-behavior relationships and/or identification of lesions. It has been argued that current neuropsychological evaluations continue to pay minimal attention to the functional (versus diagnostic) utility of tests (Johnstone & Frank, 1995; Kreutzer, Leininger, & Harris, 1990), and consequently, most research to date continues to attempt to
describe and predict brain-behavior relationships, with relatively minimal research focused on demonstrating how neuropsychological evaluations can direct treatment and impact outcome.

If neuropsychology is to continue to succeed as a psychological specialty, there is a need to evaluate our current position as providers of specialized psychological services, and determine areas of necessary competence that need further development. This article briefly reviews Division 40 training guidelines and argues for additional guidelines that will improve training in the field’s most significant training weakness, namely the functional applications of our evaluations. Several factors that necessitate these additional training guidelines are discussed, including limitations in current training guidelines, the emergence of rehabilitation as a psychological specialty, the development of advanced neuroradiologic techniques, an increased need for functional evaluations, and managed care issues. Recommendations are presented for specific training with rehabilitation and child populations, and content areas covering disability, functional outcomes, and resources available for individuals with cognitive disorders.

CURRENT NEUROPSYCHOLOGY TRAINING GUIDELINES AND BOARD CERTIFICATION

Given that neuropsychological tests were initially developed for diagnostic purposes, the training guidelines established for the practice of neuropsychology (Reports of the INS-Division 40, 1987) heavily emphasize those areas most related to diagnosis and brain-behavior relationships (e.g., neuroanatomy, neuropathology, etc.). Relatedly, Division 40 training guidelines are very limited in their suggestions for training in specific interventions for individuals with cognitive or behavioral dysfunction, or issues related to functional outcome. For example, the only guidelines related to the treatment of cognitive problems are limited to statements calling for training in “neuropsychological interventions,” whatever they may be. Furthermore, the written examination for board certification in clinical neuropsychology calls for distinct areas of competence that need to be demonstrated in the general areas of child neuropsychology, adult neuropsychology, neuroscience, behavioral neurology, and general clinical psychology. Nowhere does it stipulate one must have knowledge regarding functional utility of evaluations or resources available to individuals with disabilities. This is problematic in that neuropsychologists may be able to accurately diagnose cognitive disorders and describe test results, although they may not have the knowledge to make appropriate functional recommendations. Often patients are given multiple neuropsychological tests and detailed neuropsychological reports are written that have very little practical information. As Rosenthal (in Johnstone et al., 1996) states, significant limitations to the success of psychology in medical settings include “psychologists writing reports that lack ecological validity and have little practical value” (p. 343). To date neuropsychologists have been concerned with limiting other inadequately trained psychologists from practicing neuropsychology, with calls for the restriction of neuropsychological testing to only those with advanced training. Unfortunately, any psychologist with only generalist training can administer standard intelligence and academic measures and make gross interpretations regarding brain dysfunction. A system to better monitor the inappropriate delivery of neuropsychological services is obviously necessary. However, conversely, neuropsychologists need to also acknowledge weaknesses in neuropsychological training and either limit the services neuropsychologists provide in these areas, or better train ourselves and our students to be able to provide such services. Given the rapid changes affecting the delivery of psychological services in health care, it is arguable that neuropsy-
chologists need to develop new training guidelines to better our knowledge of functional and rehabilitation issues. If neuropsychologists suggest only we should administer and interpret neuropsychological evaluations, then we must ensure we are adequately trained to not only provide accurate diagnoses, but also provide appropriate treatment recommendations and direct patients to appropriate resources.

THE EMERGENCE OF REHABILITATION PSYCHOLOGY

A major factor suggesting that neuropsychologists need to be better exposed to rehabilitation settings and better trained in functional issues relates to the recent publication of APA Division 22 (Rehabilitation Psychology) guidelines for training in rehabilitation (Patterson & Hanson, 1995). As Rehabilitation Psychology has only recently been recognized as a specialty, many neuropsychologists have been hired to work in rehabilitation settings (Parker & Chan, 1990), many possibly without specific training in rehabilitation. However, with the recent publication of Division 22 training guidelines, the rehabilitation psychology specialty may be better positioning itself for the future by better training psychologists in a broader range of psychological skills necessary to work with a broader range of patients.

Review of Division 22 guidelines illustrates the superior training recommended in disability issues, functional outcomes, and resources available for individuals with disabilities. In general the guidelines stipulate the need for training with several diverse populations, including those with: spinal cord injury, brain injury, neurological disorders, musculoskeletal problems, orthopedic injuries, amputation, chronic pain, impairment of sensory modalities, burns, disabling medical conditions, substance abuse, mental retardation, psychiatric disability, etc.

In addition, recommendations for Content Areas in which to receive training include: cognitive, affective, and societal sources of handicapping myths about disability; neuropsychological assessment; cognitive retraining; aging, chronicity, and sexuality of disability; vocational assessment and rehabilitation; issues in independent living; psychosocial adjustment models of disability; neuroanatomy and physiology; brain-behavior relationships; psychopharmacology; facilitating interdisciplinary team functioning; substance use, abuse, and treatment; ergonomics; advocacy issues; legislative issues; assistive technology; cultural/ethnic diversity; participation of the family in the rehabilitation process; behavioral applications in assessment and treatment; psychotherapeutic interventions in the rehabilitation setting; financial and administrative aspects of providing inpatient and outpatient rehabilitation services, etc.

Clearly Division 22 guidelines are much broader than Division 40’s, which primarily call for training with neurologic, neurosurgical, and psychiatric populations (and specialty populations through geriatric or epilepsy clinics). Furthermore, Division 40 guidelines heavily emphasize brain-behavior relationships and diagnosis. There are no guidelines for training with rehabilitation populations, or in any content areas related to disability (e.g., aging, sexuality, adjustment), educational or vocational functioning (assessment and treatment), or specific treatment interventions (e.g., cognitive remediation, assistive technology, etc.). As stated previously, the only Division 40 guidelines for training in interventions include: (a) training in methods of intervention specific to clinical neuropsychology; and (b) direct intervention with patients specific to neuropsychological issues, and to include psychotherapy and/or family therapy. In a managed care setting, it is far more likely individuals with broader training that emphasizes methods by which to better functional outcomes (i.e., vocational, educational, daily living) and minimizes costs will be hired. Professionals with expertise only in diagnosis and assessment may be putting themselves at a disadvantage in
the market place. Given these factors, there is a need to better train neuropsychology students/interns/fellows in issues related to rehabilitation, educational interventions, functional outcomes, and disability.

**ADVANCED NEURORADIOLOGICAL TECHNIQUES**

In addition to the recognition of Rehabilitation Psychology as a specialty, other factors necessitate additional training guidelines for neuropsychology. For example, the increasing sophistication of neuroradiological evaluations is reducing the need for solely diagnostic neuropsychological evaluations. When diagnosing brain dysfunction, MRI, CT, SPECT, and PET scans are much more accurate in identifying specific structural and physiologic brain abnormalities. Neuropsychological evaluation, in contrast, is able to only infer structural or physiological abnormalities. Given the diminishing resources available for all health care procedures, insurance companies are going to be increasingly less willing to pay for both diagnostic neuroradiological and neuropsychological evaluations. Given the increased accuracy of neuroradiologic techniques, and general trends for insurance companies to reimburse medical rather than psychological services, it is likely that neuropsychological assessments will be rejected for reimbursement.

Although neuropsychological evaluations provide less specific information regarding structural and physiological brain functions, it is imperative to note that neuroradiological evaluations do not provide any information regarding functional skills. Although they may be able to identify specific anatomical lesions and/or areas of diminished blood flow/metabolic activity, this information does not inform one regarding the functional limitations that will be associated with brain abnormalities. Although an individual may have diffuse cerebral atrophy, or an area of hypoperfusion, they may not have associated neuropsychological deficits. Neuropsychology, on the other hand, provides very specific information regarding the cognitive and functional limitations of the individual, regardless of neuroradiologic results. If neuroradiologic findings are negative, but neuropsychological deficits are evident, the neuropsychological results stand on their own and cannot be minimized. Similarly, if neuroradiological findings are positive, but neuropsychological abilities are determined to be intact, it can be concluded that an individual’s cognitive abilities are intact regardless of the neuroradiological findings. For these reasons it is imperative for the field of neuropsychology to be better trained in, and to better market, the functional capabilities of neuropsychological evaluation. This need for greater emphasis on the functional utility of neuropsychological assessments has been increasingly noted in the literature (Heinrichs, 1990; Johnstone & Frank, 1995; Kreutzer, et al., 1990; Mapou, 1988), with several psychologists predicting a greater need for neuropsychology in rehabilitation settings, as well as a need to update and revise current Division 40 training guidelines (Johnstone & Frank, 1995; Matthews, 1996; Puente, 1992; Rourke, 1991).

**INCREASED NEED FOR FUNCTIONAL NEUROPSYCHOLOGICAL ASSESSMENTS**

Neuropsychological evaluations are being more frequently requested solely for functional purposes, including the delineation of cognitive strengths and weaknesses, prediction of deficit areas, and recommendations for remediation/compensation of abilities for work, school, and home settings. This growth of more functionally based neuropsychology is due to several factors, including: the increased number of individuals with brain dysfunction who survive accidents or disabling disease (Frank, Gluck, & Buckelew, 1990); the substantial
growth of rehabilitation psychology positions (Leung, 1990); and the increased use of neuropsychological evaluations in academic and vocational settings to enhance school/work performance. In general, there is a growing emphasis on providing individuals with all types of disabilities with appropriate diagnostic evaluations and treatment services. Neuropsychology can provide many of these services, although the functional utility of these evaluations will need to be better demonstrated and marketed.

Functional neuropsychological evaluations are also increasingly needed for vocational reasons. Every state in the United States has a Division of Vocational Rehabilitation (or similar name) that assists individuals with physical, mental, or cognitive disabilities in finding, being trained for, or maintaining employment. As part of the vocational rehabilitation process, vocational rehabilitation counselors are required to provide appropriate medical and psychological evaluations to help determine the functional implications of their clients' disabilities. For individuals with cognitive disabilities, the necessity of neuropsychological evaluations are obvious. For example, in many states the respective Divisions of Vocational Rehabilitation provide services for individuals with specific learning disabilities (if it presents a vocational limitation), and frequently requests neuropsychological evaluations for those clients to assist in directing vocational/educational planning. The possibilities for provision of these services for this population are expanding, although it is again stressed that neuropsychological training guidelines must address those issues that are relevant to such academically-vocationally based evaluations.

Similarly, there have been several legislated educational acts that necessitate thorough evaluation of functional deficits in school-aged children. For example, the Individuals with Disabilities Education Act (IDEA: Public Law 101-476, 1991) stipulates that a free and appropriate education must be provided for all children with disabilities. Such children must undergo a comprehensive assessment of abilities in seven areas of functioning: vision; hearing; intellectual/cognitive/adaptive behavior; language; motor skills; academic achievement; and socioemotional/behavioral functioning. If the child meets criteria for one of 13 different educational diagnoses, then a special instructional program must be designed to meet the child’s individual needs (Individual Education Program; IEP). Some students can be served under Section 504 of the Rehabilitation Act of 1973, which ensures equal educational opportunities for children with disabilities (see Silver & Oakland, in press, for a review of educationally relevant legislation). The growth of the Neuropsychology branch of the National Association of School Psychologists also illustrates the growth of neuropsychological services in educational settings. However, INS/Division 40 training guidelines do not yet require knowledge about educational laws, programs, or systems. This information is essential if evaluations of children with neuropsychological disabilities are to have functional utility in the school setting.

**MANAGED CARE ISSUES**

Although many issues are driving neuropsychology toward more functionally based evaluations, managed care may be having the biggest impact in this transition. With the heavy emphasis on cost-containment evident in managed care, competition for services is increasing. Frank and Johnstone (1996) note the potential problems that are likely to develop in the future as psychology continues to produce more practitioners than are needed for the market. With more doctoral-level graduates competing for fewer positions, and the likelihood that psychologists with only generalist training will be more attractive as new hires by managed care companies, many of these individuals will likely offer their services as neuropsychologists, regardless of their training. Although there is a need to ensure that only those with
adequate skills and training perform these services, the field of neuropsychology must do more than just protect itself as a specialty by limiting who can provide neuropsychological services. Providing additional training in functional issues is an appropriate first step in broadening neuropsychologists' competencies.

It can also be argued that neuropsychologists need to be better trained in functional issues given economic factors (i.e., profitability) targeted by managed care companies. Currently, the emphasis of managed care is on cost-containment, with the goal of paying the least amount of money to provide the minimal level of services to treat patients adequately. Those services that are demonstrated to be cost-effective, and shown to be related to positive functional outcomes, are going to be those that will be reimbursed in the future. Unfortunately, the data on the cost-effectiveness of neuropsychological evaluation and treatment is woefully limited.

Neuropsychology will need to expand training guidelines to include functional outcomes for these economic reasons. Bistany (1994) reports that $158 billion is spent each year on rehabilitation. Because rehabilitation has been slower to be impacted by managed care given initial limitations in defining diagnostically related groups (DRGs) in rehabilitation, functionally based neuropsychological evaluations are more likely to be reimbursed. In addition, rehabilitation has consistently been shown to be cost-effective. For example, Cherek and Taylor (1995) report that for a large insurance company over a 6-year period, every dollar spent on rehabilitation was associated with an average savings of $35 in disability reserves, and that savings from medical case management programs have grown from $0.5 million to $8.1 million in that same time frame. Similarly, a special issue of The Journal of Head Trauma Rehabilitation focused on the economics of traumatic brain injury (TBI), with several articles reporting the cost effectiveness of specific neurorehabilitation programs (but not specific neuropsychological services) in the treatment of TBI (Barry & Schafer, 1993; Bryant, Sundance, Hobbs, Hobbs, Henkins, & Rozance, 1993). Obviously it is imperative that neuropsychologists demonstrate the relationship between neuropsychological services and functional outcomes (i.e., vocational/educational functioning), as it is becoming very clear that neuropsychological test scores by themselves are not appropriate to use as indices of functional outcomes. If this relationship is established, reimbursement for neuropsychological services in the future will be more likely.

PROPOSED ADDITIONAL TRAINING GUIDELINES

Given the above factors, the need exists to expand suggested areas of training for neuropsychologists to include issues pertaining to rehabilitation, disability, functional outcome, and resources available to individuals with neuropsychological disabilities. Although it may be desirable to include the following as part of current INS-Division 40 training guidelines, as well as an additional content area for demonstration of competency for board certification, it is recommended that professionals involved in the training of neuropsychology students, interns, and fellows informally incorporate these suggested guidelines to improve existing training opportunities. Following are recommendations for additional training guidelines for (a) rehabilitation populations, (b) functional outcomes content areas, and (c) experiential site visits.

**Rehabilitation Populations**

- Traumatic brain injury
- Cerebral vascular accidents
• Multiple sclerosis
• Systemic illness with CNS involvement (e.g., lupus)
• Toxin exposures
• Hypoxic injuries
• Developmental disabilities
• Specific learning disabilities
• Autism

**Functional Outcome Content Areas**

1. Disability issues for individuals with neuropsychological disorders (e.g., sexuality, discrimination, adjustment, sensitivity training, assistive technology, etc.).
2. Ecological validity of neuropsychological measures (e.g., generalizability of tests to functional skills (e.g., Sbordone & Long, 1996).
3. Vocational assessment/training (e.g., knowledge of state vocational rehabilitation (VR) programs; criteria for receiving VR services; vocational evaluation and training services; supported employment opportunities, function of job coaches, etc.).
4. Academic programs for students with disabilities (e.g., university programs for students with disabilities; Public Law 101-476; Section 504 of the Rehabilitation Act of 1973; the special education process, including diagnoses and IEP development; placement options for special education students).
5. Independent living issues and resources (e.g., state/national programs to increase opportunities for independent living).
6. Specific cognitive remediation and behavioral interventions (e.g., standard remediation procedures for memory, attention, problem solving, unawareness, visual-spatial deficits, etc. (e.g., Sohlberg & Mateer, 1989).
7. Resources for individuals with disabilities/disorders (e.g., national and state support groups for traumatic brain injury, multiple sclerosis, cerebral vascular disorders, Alzheimer’s, Parkinson’s, Tourette’s, learning disabilities, etc.).
8. Government assistance programs (e.g., social security disability programs, etc.).

**Experiential Site Visits**

• Outpatient brain injury treatment programs
• Transitional living centers
• Vocational evaluation and training centers
• University offices for students with disabilities
• Elementary/high school special education departments
• Work hardening centers
• Living centers for individuals with disabilities

Whether additional guidelines are officially adopted by Division 40 or not, neuropsychologists need to better educate themselves and their students in these functional areas. It is also important for neuropsychologists to work with other psychological specialties (e.g., school psychology, rehabilitation psychology, health psychology) to ensure that individuals with disabilities are provided with the best psychological services possible.

**REFERENCES**


