

**SPECIAL ISSUE: Controversies in Neuropsychology  
NeuroRehabilitation 2001;16(4)**

**CONTROVERSIES IN NEUROPSYCHOLOGY**

**Editorial Message**

We proudly introduce this special issue highlighting major controversies in the clinical practice of neuropsychology in neurorehabilitation. In order to accurately present as many controversies as possible, we necessarily deviate from the usual journal format by including more articles and allowing greater editorial license for the authors, who represent a group of talented critical thinkers who are making significant contributions in advancing the practice of this field.

Notably, the last decade has witnessed phenomenal growth in neuropsychology as a scientific and applied discipline. As a brain behavior relationship specialty, clinical neuropsychology is afforded a unique opportunity for integrating recent developments in the clinical neurosciences with behavioral and medical knowledge to provide useful rehabilitation applications. However, as a young and developing field, neuropsychology is experiencing unavoidable growing pains.

This “controversies” issue reflects our belief that open self-examination is a prerequisite to the growth and development of neuropsychology as a science. This perspective follows the trend set by the several authors who served to inspire this effort. Dr. Carl Dodrill, in “Myths of Neuropsychology” [1] found that several widely held assumptions appeared to be myths under critical inspection and offered suggestions for remediation. Dr. Jerry Sweet, in “Forensic Neuropsychology: Fundamentals and Practice” [2] extended this perspective to a critical examination of the practice of neuropsychology as applied in the courts and defined a model for its objective scientific that applies more generally. We followed this trend with a special issue of “Brain Injury Source” devoted to introducing controversies in neuropsychology [3] to an interdisciplinary and diverse audience interested in brain injury rehabilitation.

This special “controversies” issue extends from our previous effort to address some of the more controversial issues in the clinical practice of neuropsychology. The authors were selected based on their ability to critically address these issues. Although space requirements limit full explication of remediation for all of the controversies raised, basic recommendations and guidelines are offered. Space limitations further prevented our including a Letter to the editor and Author’s reply contiguous with each paper, but we include a few and will include the rest in a future issue.

Dr. Sbordone begins the issue by summarizing problems with the ability of tests designed to diagnose brain impairment to predict real-world functioning. He both defines and offers remedial guidelines for problems with ecological validity. Dr. Senior follows by providing impressive evidence from a very large database indicating that standard interpretive procedures of the MMPI are misconceived and misapplied. Alternately, he proposes a more rational hypothesis testing procedure.

Dr. Gouvier's editorial article highlights widespread prevailing ignorance and failure to use base rates in standard clinical practice that result in frequent diagnostic misclassifications. His article reminds clinicians that knowing about the importance of base rates requires a correction in order to advance the practice of neuropsychology accordingly. Next, Dr. Williams reviews American Psychological Association standards to demonstrate specific common psychometric violations in clinical practice.

Measurement and norming problems with commonly used tests, standards regarding differential diagnoses, validity and reliability, need for manuals, standardized administration, screening, and research versions are discussed, along with prescriptive suggestions.

Dr.'s Nicholson, Martelli and Zasler review the increasing body of evidence that pain and such associated problems as affective distress, sleep disturbance and medication use can interfere with cognitive performance and confound interpretation of neuropsychological test results. These findings seem particularly relevant in cases of posttraumatic headache. The note that further study is needed to answer the many questions raised by these findings. Dr. Green then reviews some of the reasons why clinicians and researchers arrive at discrepant results and differing conclusions by examining their theoretical and practical choices, including whether and how to use tests of motivation and effort, and what failure criteria to apply and how to interpret results. He strongly argues for employing effort testing to remove error as a source of invalidity from data in not only individual assessment, but also group research studies, in order to improve the conclusions reached. Dr.'s Green and Iverson follow by examining the relationship between exaggeration and olfactory discrimination in a large sample of head injury related disability insurance applicants. They present compelling data showing that the strong observed association between brain injury severity and olfactory deficits was completely obscured in a subgroup of patients who failed one of the tests of cognitive "effort", and argue for effort testing in individual assessment in group studies of olfaction, in order to control for variance due to exaggeration and prevent overestimation of actual impairment.

Dr.'s Vanderploeg and Curtiss examine the validity of existing symptom exaggeration and malingering assessment procedures by employing a large clinical sample to test diagnostic accuracy. Using analysis of clinical cases in their sample, they observe fairly high rates of misclassification of patients with real deficits as malingerers, demonstrating the inherent difficulties in interpreting poor performances on symptom validity measures as indicative of malingering. Dr. Colby then very specifically addresses validity of test procedures using for a measure of exaggerated memory deficits. Using computer generated data, he examines the efficacy of different cut scores based on statistical score distributions on accuracy of classification decisions. He recommends changes for improving decision rules and norms for this test and for neuropsychological tests generally.

Dr.'s Fox and Lees-Haley proceed with an irreverently witty editorial about whether the practice of forensic neuropsychology can call itself scientific by poking holes at rampant problems in typical practice. They provide support for the perspective that this is an incipient discipline in great need of research and modesty with a very short list of uncontroversial "established facts". Underlining the theme of this issue, this editorial truly proposes critical self-examination and proposes suggestions for promoting the scientific practice of Forensic Neuropsychology.

Dr. Purisch next addresses criticisms and misconceptions of the Luria Nebraska Neuropsychological Battery that have deterred its use. He argues that its application of the Lurian theoretical model produces advantages beyond diagnostic discrimination to formulating rational treatments, counseling and guidance and analyzing components of behavioral functioning within the real world context. Dr.'s Schatz and Chute and Ms. Hughes then evaluate factors determining which individuals received neuropsychological evaluations following brain injury from state wide records between 1985 and 1995. They found that, for this period, health care reform did not adversely affect neuropsychological evaluation provision, but that only a discrete sample of individuals received evaluations.

Dr. and Ms. Barisa's paper contrasts traditional uses of neuropsychological evaluation versus needs of vocational rehabilitation counselors. They subsequently identify ways for neuropsychological evaluations to (a) address the multiple and complex questions associated with vocational rehabilitation referrals and predictions in everyday work environments and to (b) convey this information in clear, concise and easily understood terms. Finally, Dr. Hammond, in the only treatment study in this issue, reviews the literature in this controversial area and reports on a case study of a patient with rapid onset chronic fatigue syndrome marked by significant cognitive impairment and excessive left frontal theta noted on Quantitative EEG. A novel treatment approach utilizing EEG neurofeedback and self-hypnosis training was employed with produced considerable improvement on standardized measures and collaborative interviews, with most changes maintained at 9 month follow-up testing.

Finally, we have included several Letters to the Editor regarding several of the articles, as well as a couple of Responses from the Authors. Because of space limitations, we will include additional Letters and Responses in a future issue. Our intention, again, is critical self-examination in the service of advancing neuropsychology as a science and a useful neurorehabilitation service. We do this without squeamishness about challenging the established professional guild, and in an international format, because we believe that elaborating controversies and mobilizing opinions can hopefully facilitate the goal of coalescing ideas to promote increased utility of neurorehabilitation services.

Michael F. Martelli, Ph.D.  
Nathan D. Zasler, MD

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## **Controversies in Neuropsychology**

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**SPECIAL ISSUE: Controversies in Neuropsychology  
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## **ABSTRACTS**

NeuroRehabilitation 2001;16(4):199-201

### **Limitations of neuropsychological testing to predict the cognitive and behavioral functioning of persons with brain injury in real-world settings.**

Sbordone RJ.

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While neuropsychological tests have been designed to identify cognitive impairments stemming from a brain insult and their severity, the vast majority of these tests were never designed to predict how these patients were likely to function in real-world settings, live independently, return to work, or maintain competitive employment. No one specific neuropsychological test or measure can accurately predict how an individual who has sustained a brain insult will function in everyday or vocational settings. Predictions based on neuropsychological test data tend to be more accurate if the particular tasks utilized during testing closely match or simulate the individual's everyday and vocational demands. Predicting an individual's vocational potential also requires a careful assessment of his or her work and medical history, injury characteristics, emotional and behavioral functioning, motivation to return to work, and family circumstances.

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NeuroRehabilitation 2001;16(4):203-13 Related Articles, Books

### **Misconceptions and misuse of the MMPI-2 in assessing personal injury claimants.**

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The MMPI-2 enjoys widespread popularity in the psychological assessment of personal injury claimants, in part due to its long history, massive research literature, strong empirical basis, and the availability of commercial interpretative and scoring services. However, the relative paucity of studies examining the forensic role of the MMPI-2, raises concerns about the applicability of traditional interpretative guidelines in the medicolegal arena. This paper analyses MMPI-2 protocols of 2080 cases derived from a forensic psychiatric practice in Brisbane, Australia. The data presented here challenges these traditional MMPI-2 interpretations and calls into question assumptions and commonly employed techniques when applied in this setting. In particular, the validity of codetype-based interpretations, the role the MMPI-2 plays in differential diagnosis, and assumptions regarding diagnostically-specific patterns on the test are challenged. MMPI-2 interpretative cookbooks, computer report-writers, adherence to the intent of the test-developers, and appeals to authority are inadequate substitutes for empirical accuracy, and an active

hypothesis-testing interpretative approach, based upon setting-specific base-rate data, is recommended.

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NeuroRehabilitation 2001;16(4):215-9

**Are you sure you're really telling the truth?**

Gouvier WD.

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The core constructs of psychological assessment, reliability and validity, are shown to be incomplete and lacking whenever base rates for the conditions under evaluation skew markedly from 50/50. Under such circumstances, base rate information can exert a greater influence on diagnostic accuracy that is typically recognized among practitioners. The influence of base rates is so profound, that conclusions based on reliable and valid test data are often, more probably than not, wrong! This paper outlines our historical understanding of the "base rate fallacy", and offers explanations for its persistence in the practice of diagnostic psychology.

Recommendations for self-monitoring and policing of our profession are offered, in order that neuropsychology might improve its diagnostic accuracy at a rate more comparable to the progress made in similar fields in medicine.

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NeuroRehabilitation 2001;16(4):221-4

**Psychometric concerns in neuropsychological testing.**

Williams AD.

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This article describes measurement and norming problems with commonly used neuropsychological tests. Test standards regarding differential diagnoses, validity and reliability, the need for manuals, standardized administration, screening, and research versions are discussed. Further development of reliability, validity, sensitivity and specificity is needed for many tests.

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NeuroRehabilitation 2001;16(4):225-30

**Does pain confound interpretation of neuropsychological test results?**

Nicholson K, Martelli MF, Zasler ND.

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There is increasing evidence that pain and related problems (e.g., affective distress, sleep disturbance, medication use) can interfere with cognitive performance and confound the interpretation of neuropsychological test results. This may be of particular concern in cases of the persistent post-concussive syndrome where headache is the primary problem. Such effects can be pronounced, obscuring the effects associated with mild or even much more significant brain injury. However, it remains unclear what specific chronic or acute pain experiences, in what individuals, with or without which associated problems, will actually result in particular performance deficits. Whereas pain may disrupt brain function, this is likely to be temporary and not indicative of permanent impairment of neuropsychological function. Further study of this important topic is warranted.

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NeuroRehabilitation 2001;16(4):231-6

**Why clinicians often disagree about the validity of test results.**

Green P.

Neurobehavioural Associates, Edmonton, Alberta, Canada.

Examining the validity of test results using specialised methods is still a relatively new venture and many different approaches are taken to the same task. This paper discusses some of the reasons why discrepant results and differing conclusions may be arrived at by clinicians or researchers, depending on their theoretical and practical choices. These choices include whether to test for effort, what methods to use, how to employ effort tests, what failure criteria to apply and how to interpret individual results. Equally important is the decision about whether or not to employ effort testing to remove error from data in group research studies. No consensus has yet been reached on the need for systematic effort testing in group studies but there are indications that it should be a serious consideration because controlling for invalid data can lead to altered conclusions.

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NeuroRehabilitation 2001;16(4):237-43

**Effects of injury severity and cognitive exaggeration on olfactory deficits in head injury compensation claims.**

Green P, Iverson GL.

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The purpose of this study was to examine the relationship between exaggeration and scores on a test of olfactory discrimination in patients being assessed in connection with a claim for financial benefits. Participants were 448 patients referred to a private practice in Edmonton, Alberta, Canada for psychological or neuropsychological assessment, related to evaluation of impairment and disability resulting from a work-related or non-work related accident. All patients were involved in some form of compensation claim at the time of their evaluation. All patients completed two tests designed to detect exaggerated cognitive deficits, the Computerized Assessment of Response Bias (CARB) and the Word Memory Test (WMT) as part of their evaluation. The diagnostic groups included 322 head injury cases, varying from very minor to very severe. Normative data for the smell test were derived from 126 patients with orthopedic injuries who passed both the CARB and the WMT. Patients with more severe traumatic brain injuries were 10-12 times more likely to have olfactory deficits than persons with trivial to mild head injuries. In a subgroup of patients who failed either the CARB or the WMT, there was no relationship between injury severity and total scores on the smell test. Therefore, the dose-response relationship between brain injury severity and olfactory deficits is severely attenuated when patients who are probably exaggerating their cognitive deficits are included in the analyses. Those patients with trivial to mild head injuries who demonstrated adequate effort on both the CARB and the WMT were no more likely to show olfactory deficits than the non-head-injured orthopedic control subjects. Therefore, anosmia following mild traumatic brain injury should not be concluded from self-reports or from tests of smell unless tests of effort have been passed. Effort should also be controlled in group studies of olfaction.

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NeuroRehabilitation 2001;16(4):245-51

**Malingering assessment: Evaluation of validity of performance.**

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Consideration of symptom exaggeration or overt malingering is of particular importance in assessment of alleged mild head trauma and other mild or questionable personal injury situations. Validity is the extent to which tests assess what they were designed to measure. The determination of invalidity is part of the overall neuropsychological interpretation process. In neuropsychology a line of validity assessment research has developed, leading to three general approaches to validity and/or malingering assessment: (a) symptom validity measures, (b) invalid patterns of performance on clinical neuropsychological measures, and (c) concomitant extra-test behavioral information or observations. In each case some aspect of behavior is compared to an external standard or to other intra-subject behavior. Inconsistencies and discrepant comparisons are cause for validity concerns. These approaches are described and recommendations are provided based on the extant literature. However, validity assessment is difficult and at times ambiguous in part because real and feigned deficits are not mutually



exclusive. In some clinical situations the most that can be said about an invalid performance is that it is not indicative of the true neurobehavioral capabilities of the person being evaluated, and is not consistent with the presumed etiologic event.

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NeuroRehabilitation 2001;16(4):253-65

**Using the binomial distribution to assess effort: Forced-choice testing in neuropsychological settings.**

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The binomial distribution is often, but prematurely, rejected as a tool for assessing effort. This study extended previous research using published clinical and computer-generated pseudo subject data for the Test of Memory Malingering (TOMM). The efficiencies of eight cut points based upon inverse binomial distribution functions were compared with the cut point recommended in the test manual for making correct classifications, and a new statistic, the total number of errors, was also compared with the test manual cut point. Repeated measures, multivariate, and univariate ANOVAs, Bonferroni-corrected post-hoc t-tests, and normal curve density functions were employed to assess the homogeneity of groups within experimental conditions. Based upon these analyses, changes were recommended in the decision rules for the TOMM, and strategies for improving the norms for the TOMM and for neuropsychological assessment instruments, generally, were discussed.

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NeuroRehabilitation 2001;16(4):267-73

**Isn't everything in forensic neuropsychology controversial?  
Lees-Haley PR, Fox DD.**

Abstract Unavailable

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NeuroRehabilitation 2001;16(4):275-80

**Misconceptions about the Luria-Nebraska Neuropsychological Battery.**

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The Luria-Nebraska Neuropsychological Battery (LNNB) was introduced in the late 1970s as a fixed battery derived from clinical procedures and based upon the neuropsychological theory developed by the late Russian neuropsychologist Alexandr Luria. Considerable debate arose about the LNNB and it became the focus of harsh criticisms. The major criticisms related to the belief that the qualitative and quantitative approaches could not be fused, that the scales were too heterogeneous to produce meaningful scores, that the battery suffered from significant limitations in sampling of neuropsychological skills, and that it had questionable sensitivity to brain dysfunction. These criticisms generally reflected an unawareness of the interpretive process and theory underlying the LNNB, and have been largely negated by a large empirical literature that has evolved over many years. This article addresses the misconceptions perpetuated about the LNNB as a result of these early criticisms and discusses the applications and limitations of the battery based upon an understanding of its construction, theory, and research.

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NeuroRehabilitation 2001;16(4):281-7

**Underutilization of neuropsychology in traumatic brain injury rehabilitation: Is managed care to blame?**

Schatz P, Hughes LJ, Chute DL.

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We evaluated factors determining which individuals received neuropsychological evaluations (NPEs) following traumatic brain injury (TBI). Comprehensive records from a State-wide/sponsored Head Injury Program were followed from 1985--1995 to monitor effects of managed care on provision (or absence) of formal NPEs and ultimately on rehabilitation outcome. Only 26% NPEs (within their first three years post-injury). In the years prior to and after large changes in managed care, there were no differences in the provision of formal NPEs. Discriminant analysis identified functional status at discharge from primary rehabilitation and total number of rehabilitation facilities as the two variables that most distinguished those who had received NPEs with 69% classification accuracy. Between group analyses revealed that individuals were more likely to receive NPEs if they were young, involved in liability claims, attended multiple rehabilitation facilities, or had higher functional status at discharge from primary rehabilitation, regardless of the nature or severity of their TBI. Individuals receiving formal NPEs ultimately achieved higher levels of functional independence, suggesting a potential selection bias. Individuals were no more likely to receive NPEs according to insurance status (private versus government assisted) or as a function of the decade of their injury (1980's versus 1990's). It appears that health-care reform has had no deleterious effect on neuropsychologists' ability to provide consultative services for this population, and following TBI, only a discrete sample of individuals receive and benefit from NPEs.

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NeuroRehabilitation 2001;16(4):289-93

**Neuropsychological evaluation applied to vocational rehabilitation.**

Barisa MT, Barisa MW.

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On the surface, the use of neuropsychological evaluation to guide vocational rehabilitation does not appear controversial. However, complexities and discrepancies emerge when traditional uses of neuropsychological evaluation are reviewed and compared to the needs of vocational rehabilitation counselors. This article highlights differences in focus between traditional neuropsychological evaluations and vocational evaluations. It identifies ways to effectively merge them so that neuropsychological evaluations for vocational rehabilitation are mutually beneficial to neuropsychologists and vocational rehabilitation counselors.

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NeuroRehabilitation 2001;16(4):295-300

**Treatment of chronic fatigue with neurofeedback and self-hypnosis.**

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A 21 year old patient reported a relatively rapid onset of serious chronic fatigue syndrome (CFS), with her worst symptoms being cognitive impairments. Congruent with research on rapid onset CFS, she had no psychiatric history and specialized testing did not suggest that somatization was likely. Neuroimaging and EEG research has documented brain dysfunction in cases of CFS. Therefore, a quantitative EEG was done, comparing her to a normative data base. This revealed excessive left frontal theta brainwave activity in an area previously implicated in SPECT research. Therefore, a novel treatment approach was utilized consisting of a combination of EEG neurofeedback and self-hypnosis training, both of which seemed very beneficial. She experienced considerable improvement in fatigue, vigor, and confusion as measured pre-post with the Profile of Mood States and through collaborative interviews with both parents. Most of the changes were maintained at 5, 7, and 9 month follow-up testing.