

The Status of Clinical Neuropsychology

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INTRODUCTION

The task of any Presidential Address is to provide its members and other interested parties with an oral and later a written commentary, albeit personal and biased, of the state of the field in question. It is my duty and my honor to outline the status of this exciting field we have chosen as our primary professional endeavor.

I would like to provide some basic goals and an initial outline of my address. As indicated earlier, it is my intention to outline the status of clinical neuropsychology. I observe with pride and some amazement the unusual growth and popularity that the field has enjoyed especially during the last decade (Costa, 1988; Parsons, 1991; Reitan, 1988). I am concerned, however, with trends within our field that unconditionally endorse a specific way of thinking to the exclusion of considering alternative methods. Worse yet, I am deeply troubled with personal and what I consider unfair critiques that have been leveled at the field, in general, and certain individuals, in particular. Hence, the underlying intention of my message will be to bring balance and cohesion to the different concepts currently affecting the field of clinical neuropsychology.

I initially intend to define clinical neuropsychology from different perspectives. Next, I will address limitations present in the field prior to considering both the relevance and applications of neuropsychology. Directions for this next decade will be outlined prior to the summary and conclusions.

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DEFINING NEUROPSYCHOLOGICAL INFORMATION

Defining by History

Ebbinghaus' often quoted comment about the history of psychology is also pertinent to clinical neuropsychology; we have experienced a long past but have recorded a short history. Scholars often begin with Broca's discovery in 1860 that the base of the third frontal convolution of the left cerebral hemisphere in his patient Tan was where language was located. The discipline's history, however, can be traced to earlier times as well as to more comprehensive thinking about the brain. Ideas have originated from Socrates, Aristotle, Descartes, Muller, Fechner, Pavlov, Franz, Goldstein, even Witmer, among others.

There is a commonality to these thinkers' ideas relative to neuropsychology. Using Descartes as an example, I quote from Article two of his book, *Les Passions de l'ame* (1650): "That in order to understand the passions of the soul its functions must be distinguished from those of the body." This distinction can only be accomplished by clearly understanding the basic functions of the soul and of the body, namely the brain.

Defining by Purpose

William James, laid the foundation for what others were to say about this topic. He wrote in his 1890 classic, *Psychology*, that the purpose of the brain was to bring disparate behavior "into harmonious cooperation". A critical outcome of brain functioning was organized behavior and the most organized of all behaviors was consciousness. Psychology was defined by James (1890) as the "description and explanation of states of consciousness". The task of clinical neuropsychology today appears quite similar to that outlined by James for psychology.

Meier (1974), Lezak (1983), and many others have defined clinical neuropsychology as the study of brain-behavior relationships. It must be noted that this approach assumes a philosophically limited position. Specifically, the definition assumes that behavior and brain are two separate entities and further that behavior is a function of brain states, and not vice versa.

Defining by Method and Practice

Clinical neuropsychology, much like all other clinical sciences, employs the emperico-deductive method. General concepts are formulated by acquiring empirically derived data.

Numerous surveys have been published during the last decade including Hartlage and Telzrow (1980), Hartlage, Chelune, and Tucker (1981),

McCaffrey and Isaac (1984), and Seretny, Dean, Gray, and Hartlage (1986). Two excellent surveys were published in 1990, one by Guilmette, Faust, Hart, and Arkes and the other by Putnam and DeLuca. These surveys indicate that clinical neuropsychologists work in private practice settings, followed by medical centers, and then universities/colleges. Most neuropsychologists perform evaluations, with an increasing number batteries or a combination thereof cases. Most professionals use the standard types of tests to use. They agree that with a relatively high agreement of what types of tests to use. They agree that the Wechsler Scales, both intellectual and memory, are of critical significance. Few engage in rehabilitation or therapy and most primarily work with head injured and to a lesser degree psychiatric patients.

Diversity appears to be a cornerstone of our discipline. Diversity is reflected in many areas including in the training and backgrounds of those currently engaged in clinical neuropsychological practice. While this may be a problem of sorts, I will argue later that diversity, at least in a minimally controlled fashion, is needed for a healthy and forward moving field.

LIMITATIONS OF NEUROPSYCHOLOGICAL INFORMATION

Concerns of Questioning Limitations

According to Kuhn (1970), for a discipline to be accepted as scientific, it must be based on "research firmly based one or more past scientific achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice." The possibility exists that neuropsychology's achievement does not meet the criteria for "normal science," in Kuhn's terminology, clinical neuropsychology could be preparadigmatic (i.e., prescientific).

Such questioning would then leave the discipline and ourselves in a highly compromised position. What can we tell our patients, our students, worse yet, society. Are we practicing a science that does not yet exist?

Science and Practice

Biopsychosocial Perspectives. Little doubt exists that clinical neuropsychology today is not what it was even 10 years ago. Most of that progress has emerged in psychometric advancements. Excellent books by Lezak (1983), Franzen (1989), and more recently by Spreen and Strauss (1991) provide comprehensive analyses of different techniques and methods. However, I find that this scientific progress has come at a relatively large expense. Nowhere in the literature does one find an adequate understanding beyond the instruments we use to assess brain function or, in some cases (especially in the neurosciences)

brain function itself. As Puente and McCaffrey (1992) have argued, there is much more to clinical neuropsychological assessment than these two variables.

For example, the *Handbook of Clinical Neuropsychological Assessment* (Puente & McCaffrey, 1992) includes chapters on handedness, age, education, demographic, psychopathological, medical, socio-cultural, and environmental variables. Ardila, Roselli, and Ostrosky (1992), for example, address the importance of socio-cultural status in terms of both the evaluation itself as well as the potential impact on brain structure and functioning. The patient must be understood, much like what Lewin (1954) proposed for understanding personality, in a much broader context than heretofore considered. In doing so such things as premorbid history and secondary gains become part of the clinical presentation rather than variables to factor out of the question of dysfunction.

Assessment Gathering Procedures/Bias in Information. The empirico-deductive method in science assumes that data should be gathered according to scientifically correct methods. The question then arises, do neuropsychologists gather clinical information without bias. Wedding and Faust (1989) suggested that bias often affects the standard neuropsychological evaluation. These problems are compounded with the subjective or so-called clinical intuition method of arriving at conclusions. Faust (e.g., Faust, Guilmette, Hart, Arkes, Fishburne, & Davey, 1988), in other articles, has also suggested that such bias may become more of a problem as experience of the practitioner increases.

Procedure Based Evaluations. A review of "practice" surveys have indicated that both neuropsychological batteries, the Luria-Nebraska and the Halstead-Reitan, have enjoyed wide acceptance along with the flexible approach. The most recent survey by Putnam and DeLuca (1990) indicates that the flexible approach has gained a greater acceptance as of recently. Thus, when asked for one's preference in testing, one would have to identify oneself as a "Luria, Nebraska" or a "Halstead Reitan" or maybe even a "flexible" professional.

It is acceptable, if not desirable, to have expertise in one testing approach over another. What is questionable is that the purpose of testing is often lost when that preference for one of these batteries (approaches) has been made. Kaplan (1983) and others would suggest that this is what drives testing. However, it seems that for many practitioners flexible means that the test is chosen to fit the clinical problem in question. Should that interpretation be further expanded to imply that the entire evaluation be flexible to meet the purpose of the evaluation? According to one of the recent practice surveys, Guilmette et al. (1990) provided eight different reasons for completing neuropsychological assessments. Granted, my sphere of experiences is limited, but I have yet to see eight different types of reports. My experience suggests that the testing preference shapes the evaluation. Should the testing preference not be subservient to the purpose in question?

Base Rates and Human Variability. Another implicit assumption in neuropsychological assessment, and for that matter in science, is that a score means something because it is comparable to a reference value. This is a foundation for individual differences as well, a cornerstone for clinical neuropsychological assessment. Matarazzo (1990) has recently discussed the problem of using inter-test scatter on the WAIS as an indication of brain damage. The problem is simply that base rates are rarely available and even less well understood.

Dichotomous Data and Biological Phenomenon. In other enterprises that associate psychology with biological activity, such as psychophysiology, data is always considered as continuous. EEG measures, for example, are reflective of fluctuations in activity. Nothing is constant in biologically oriented activity. In contrast, neuropsychological data is commonly considered as dichotomous rather than continuous (e.g., cut-offs). While such an idea fits well into the conceptualization of clinical psychology and common statistical analyses, it does not embrace the continuity of biological events.

Executive Functions. The practice surveys that have been referred to earlier describe the different tests currently in popular use. Most of these tests suffer from a lack of sensitivity to two kinds of problems. First, such tests typically do not address executive functions well, if at all. Executive functions can be broadly defined as complex behaviors that initiate and perform complex chains of behavior. Consciousness or awareness, novel problem solving, and so on, are examples of these behaviors.

Another problem involves the assessment of very mild dysfunction as well as the assessment of patients with a relatively high level or relatively low level of premorbid intellectual or related functioning. Current neuropsychological tests appear to be more sensitive at the middle and with moderate levels of impairment than at the extremes especially with mild levels of dysfunction. This results in increased error variance in these situations. For example, false negatives are probably more common in higher functioning subjects and false positives in lower functioning persons.

Activities of Daily Living and Vocational Performance. What is the relationship of the data to real world issues? Outside of several early studies such as by Heaton and Pendleton (1981), few studies have addressed the ability of neuropsychological tests to predict everyday functioning or activities of daily living and vocational performance. This issue becomes more acute in forensic cases where settlements are based on the residual functional capacities of the patient. According to the Guilmette et al. (1990) survey, forensic predictions comprise the second most common reason for evaluating neuropsychological status. Taken together, neuropsychologists are making predictions on real world issues with a very limited data base from which to compare the patient's performance.

Rehabilitation. Two potential limitations arise when reviewing the rehabilitation literature. Those modalities that are available appear to suffer from their lack of generalization to outside-of-clinic or real world behavioral opportunities. Another problem has to do with the psychotherapeutic treatment of the brain injured. Lezak's (1983) pioneering work on treating the families of brain impaired has yet to be followed with more comprehensive studies or even models for addressing "secondary" problems, including depression, adjustment to disability, etc.

Competency and Credentialing. Competency can be broadly defined as a minimum level of proficiency. Proficiency then could be assessed by certification or credentialing mechanisms. It is standard for all professions both to define competency and later to identify members of the profession which are deemed to be competent. Clinical neuropsychology is no exception. However, this issue, probably more than any other, has produced the most serious personal and professional attacks on individuals and groups of people than just about any other topic. While disagreement is a form of progress, there are limits or rules which should be endorsed in such discussions.

I have argued elsewhere (Puente, 1990) that competency has yet to be adequately defined in clinical neuropsychology. Worse yet, the credentialing process, at least up to now, has been seriously flawed because of this void. Further, not only may the field be going about this task in the wrong manner, but the risks and potential losses may be far greater than ever considered. For example, Hogan (1983) has argued that the first step in professional regulation is at the educational level, not at the professional level. Further little evidence is found that certification enhances the quality of professional services, both in other professions (Kessler, 1970) and in clinical neuropsychology (Faust et al., 1988). Indeed, some have argued that certification is a means for eliminating competition rather than enhancing the profession (Gross, 1978).

It may well be that in attempting to legitimize itself, clinical neuropsychology may be doing so at great expense. In the long term, that expense may delete the vitality and relevance of the profession as an academic and a professional enterprise.

Education and Training

The backbone of any discipline is in the education and training of its practitioners and scientists. In neuropsychology this issue has been largely ignored.

Students. This paucity of information on students is particularly perplexing in light of the popularity of clinical neuropsychology among undergraduates and graduate students. Nevertheless, this is not the case when anecdotal data is reviewed. Using Memphis State University (D. Long, personal communication, 1991) as an example, of the 200 clinical applicants in 1991, 12 of the

top 25 chose the clinical neuropsychology program over alternatives. Such anecdotal information suggests that the pipeline of future students is quite full. Unfortunately, little formally known about the field's greatest resource — its students.

Faculty. An obvious question is who will teach these students. Using the National Academy of Neuropsychology (NAN) as an example, the organization has a membership exceeding 1,600. Of those, 85 appear to have primary academic affiliations (e.g., Departments of Psychology) and another 70 have primary affiliations with University Medical Centers based on my review of the Membership roster. Further, serious questions arise as to the education and training of those in primarily teaching positions. McCaffrey and Isaac (1984) have reported that during the early part of the 1980s, few instructors of clinical neuropsychology met the basic Division 40/International Neuropsychological Society (INS) requirements.

Curriculum. A second question is, what do we teach these students? Division 40/INS guidelines (1987) have been a benchmark from which to develop training programs. Those guidelines are in need of updating and revising.

Next is, where are those programs? In clinical neuropsychology, very few formal programs exist. Those that come to mind include the City University of New York, Drexel University, Memphis State University, University of Alabama at Birmingham, and University of Victoria. Neuropsychology "tracks" exist at institutions such as the University of Florida, State University of New York at Albany, and Hahnemann University. A review of Cripe's (1991) most recent list of postdoctoral opportunities published in *The Clinical Neuropsychologist* might lead one to conclude that the primary method of training clinical neuropsychologists is at the postdoctoral level. Division 40 has wisely decided that this list of training opportunities does not carry the Division's endorsement since the quality of these programs might actually vary considerably.

Educational Continuum. Little interest has been shown by clinical neuropsychologists in anything prior to the graduate educational experience. Such an orientation is extremely nearsighted. A review of the Division 40/INS guidelines would indicate that the average undergraduate would be woefully unprepared to handle such a curriculum. Also, the continuum should extend upward as well. What is needed is a hierarchy of education and training beginning at the undergraduate level and continuing throughout the career of the neuropsychologist.

Women and Ethnic Minorities. In clinical neuropsychology, it seems as though time has stood still for ethnic minorities. Out of the approximately 2,000 members of Division 40, several years ago I was able to locate approximately 50 ethnic minorities. Using leadership of Boards of both Division 40 and

NAN as examples, no more than three women and two ethnic minorities have served on either Board during the 1980s.

Such a lack of representation of these two groups goes against the grain of psychology's current goals. Further, it limits our interest and understanding in these populations. Finally, it decreases the number of individuals who eventually end up serving these groups. This is especially important in that recent statistics have shown that a large percentage of specific types of brain-injured individuals are of ethnic minority descent.

Policy

What policy issues has clinical neuropsychology been involved with? Take away credentialing, and there is little to show. For example, on October 11, 1991 the National Science Foundation formed two new Directorates effectively splitting the behavioral from the biological sciences. No organized neuropsychology group had any impact on this matter, and for most clinical neuropsychologists, the implications are at best foggy.

RELEVANCE AND APPLICATION

Concerns of Outlining Relevance and Application

There are concerns when reviewing potential relevance and applications of the discipline. First and foremost, one may not find much in what is useful. Secondly, what is useful might actually then be applied to determine competency. The field would then have to consider and apply such standards.

Science and Practice

Survey of Representative Current Theories. Clinical neuropsychology has both contributed to the recognition of the 1990s as the Decade of the Brain and is at the forefront in achieving the goals set by the Congress. Further, if one were to consider that Luria's ideas were the last representative ones endorsed by clinical neuropsychology, one has not been reading the literature or attending conferences. Work of Lichstein (1985) on auditory comprehension, Morton (1984) on the normal spelling process, Posner (1978) on attention, Butters (1992) on memory, Mishkin (1982) on learning, and others provide exciting ideas from which to develop concepts for research programs, clinical assessment and rehabilitation techniques, as well as orientations towards the field in general.

The recent ideas espoused by scientists and philosophers of science on the concept of catastrophe and chaos theory (e.g., Saunders, 1980) appear poten-

tially useful to clinical neuropsychology. This approach focuses on the understanding of irregularities and discontinuities of activities. Further, such an approach is useful when data appears nonquantifiable, as is often the case with clinical observation. Finally, such an approach could help understand unpredictable or unusually abrupt changes in behavior.

Techniques and Methods. Clinical assessment and rehabilitation has expanded by leaps and bounds since NAN was first convened in 1980. In terms of assessment, the number, quality, and application of tests has expanded greatly. Using the WAIS as an example, the test has now been expanded by Kaplan (1991) to be used as a neuropsychological tool. The Halstead-Reitan now has a published manual (Reitan & Wolfson, 1984) and comprehensive norms (Heaton, Grant, & Matthews, 1991). The Luria-Nebraska is being adapted to several languages with culturally relevant norms. What may be more exciting is the number of new tests that appear to expand the horizon on neuropsychological assessment. Larrabee's (e.g., Crook & Larrabee, 1992), Williams' (1990), and Wilson's (Wilson, Cockburn, Baddeley, & Hiorns, 1989) work on everyday memory are but three of the many examples that could be provided. Also, much interesting research has focused on special populations such as LaRue's (1992) book on the elderly, and Ardila, Roselli, and Puente (in press) volume on Spanish speakers.

While there is little question that rehabilitation of the cognitive impaired brain damaged subject is at its infancy, the recent publication of O'Hara and Harrells (1991) and similar books along with the formation of several societies and journals speak to the expectation that clinical neuropsychologists can finally offer hope for their patients.

Applications. Traditionally, clinical neuropsychologists have focused on the differential diagnoses. The advancement of neuroradiological techniques have forced the field to evolve in new and more creative directions (Bigler, 1991). Since there are numerous and exciting new developments, a representative view of some of these developments appears warranted.

For example, Flesher (1990) has adapted neuropsychological knowledge and information processing theory to develop a model for the cognitive habilitation of schizophrenia. Methods for the treatment of perceptual and conceptual over inclusion, over arousal, and other functional disabilities are considered. Chute and colleagues (Chute, Conn, DiPasquale, & Hoag, 1988) have been working on the application of computer software to the remediation of activities of daily living.

The application of clinical neuropsychology to clinical medicine is yet another exciting area. Tarter, Van Thiel, and Edwards (1986) book on medical neuropsychology has opened a subfield heretofore not conceived.

Education

Undergraduate. Suggestions are now available for beginning to integrate clinical neuropsychology into the undergraduate curriculum (Puente, Matthews, Williams, & Matthews, 1991). Of importance is not just the introduction of clinical neuropsychology as a separate course, but the introduction of neuropsychological concepts in courses ranging from Introductory Psychology to Physiological Psychology, Psychopathology, Clinical Psychology, Tests and Measurements, and even Personality Theory.

Graduate. Division 40/INS guidelines for graduate study are excellent starting point from which to plan a graduate curriculum. Few specialties within psychology have formulated any guidelines of this type.

Postdoctoral. A new APA Task Force has been formed on the topic of postdoctoral education. Look to clinical neuropsychology to set standards for other areas of psychology and look for the postdoctoral fellowship as the real terminal degree in applied areas of psychology.

Continuing Education. The concept of mandatory continuing education (MCE) has been accepted in principle most of the 50 states and most are moving to make MCE part of continuing licensure. Clinical neuropsychology, in general, and NAN, in particular, have been at the forefront of this movement.

Policy

APA. While organized neuropsychology has been slow to act on social and science policy, the APA has not. The Capp v Rank case in California was recently won at the state Supreme Court level. At the very base of this case was the question whether psychologists could address organically-based disorders. A loss in this case could have meant significant questions for the future of the discipline. I am proud to inform you that NAN made a substantial cash contribution to APA on behalf of the court defense.

Another issue has been the Medicare bill which passed Congress in 1990. This bill not only extends the scope of reimbursable psychological services from testing to treatment but places psychologists on even par with physicians in terms of reimbursement according to procedure. This will set the foundation for later discussion on national health insurance.

Finally, APA has formed a Task Force on Psychopharmacology, of which I happen to be one of its members. This Task Force is charged with reviewing the feasibility and potential impact for prescription of psychoactive drugs. A final report will probably be issued in 1992 and should have a significant impact on both clinical psychology and clinical neuropsychology.

NAN. I am pleased with the formation of a joint Task Force comprised of members from NAN, Division 40, American College of Rehabilitation Medicine, as well as several state psychological associations to develop a model for reimbursement of clinical neuropsychological services. It is clear that if a model for reimbursement is not developed by the field, organized medicine and/or insurance companies will do so for neuropsychology.

This section will be completed with an ending to a story most neuropsychologists have probably forgotten. Last month, I received notice that the Industrial Commission of North Carolina had *finally* reversed the original decision on the Horne v Goodson case. As you may recall, that case began in 1984 when a Deputy Commissioner of the North Carolina Industrial Commission did not accept the results of my neuropsychological assessment because I was not credible simply because I was a PhD and not an MD. An earlier decision by the State's Court of Appeals forced the Commission to once more review my findings. After many years, I am happy to report that Mr. Edward Horne was awarded actually more benefits than had been requested by his attorney based on neuropsychological testimony that was provided. And, on Monday, October 30, 1991 (2 days before this presentation) I was informed that the case will not be appealed. Horne v Goodson is now permanent case law.

DIRECTIONS FOR NEUROPSYCHOLOGICAL SCIENCE AND PRACTICE

Basic Purpose of Discipline

It would be inappropriate and unethical to categorically dismiss the field as being preparadigmatic and irrelevant. Indeed, for a discipline with no more than a 20-year history, the progress has been unexpected. However, clinical neuropsychology stands at a crossroads. The decision must be made to rededicate ourselves to two basic goals integral to our long past. First, the field should focus on the development of information that furthers knowledge about both practical and academic lines. For example, the challenge of applying neuropsychological information to resolving the question of consciousness (e.g., Henninger & Puente, in press) seems a realistic one. Secondly, neuropsychology is a unique position to assist with questions of human welfare. Considering the number of individuals with acquired neuropsychological syndromes the field is in an excellent position to address the complexity of higher order functions.

Style of Questioning

Information has been made available to the public in such a fashion that the potential relevance of the field could be misconstrued. Clinical neuropsychology has been debated in the public forum instead of the scientific arenas (e.g.,

Guilmette & Giuliano, 1991). It is hard to comprehend why the field has allowed this to happen, as if there was little else to do. There are two many horizons left unexplored for clinical neuropsychologists to spend time in such foolish endeavors. Further, professional standards that have been adopted by some are outdated and unreasonable. At times, it would appear that those standards could not even be met by those proposing them.

Specific Philosophical Approaches

Civility in questioning does not imply a restriction of questioning. Indeed, the two concepts are not mutually exclusive. I have argued elsewhere (1990) that undue restrictiveness hinders the progress of science and practice of neuropsychology. My ideas on this issue are unwavering.

Socrates. The conflict of ideas is central to the Socratic approach to the solution of a problem. Discourse and dialogue, even in the face of adversity, results in an approximation to the "truth". However, it must be remembered that there is no proprietor to a particular doctrinal conclusion. The goal is really quite simple and that is to critically examine any applicable concept. Could this approach not be used in neuropsychology?

Kuhn and Lakatos. According to Kuhn (1970) science is a form of puzzle-solving. According to Lakatos (1978), a program of questioning is only as useful as the questions that arises from investigation. One way to solve this puzzle and to develop a program of inquiry is to develop a framework from which to approach the questions, a paradigm of sorts. Ideas and knowledge are accumulated according to a paradigm or program as long as it is useful or until another one of greater heuristic value comes along. While one might expect this progress to be linear, at times it may be quite unconventional, even revolutionary. Maybe it is time to shift neuropsychological thinking to more robust paradigms.

Synthesis

Throughout this contribution a central focus has been in understanding the individual within a large contextual scope. Brain impairments do not occur in a vacuum, they occur in people with premorbid histories within large and complex biopsychosocial contexts. Understanding the properties of a neuropsychological test and the functions of the brain, two assumptions that are not often met in clinical neuropsychological practice, are at best a rudimentary foundation for what should occur. Each case is a single subject experimental design with many, many variables affecting the overall neuropsychological presentation. Wally Nauta once told me that a brain lesion did not produce a

deficit, it produced a reorganization of the subject in question. Similarly, clinical neuropsychology should shift away from simple deficit analysis to a more comprehensive understanding of the person in transition.

Paradigm Shift

Clinical neuropsychology is experiencing growth, acceptance, and popularity no other area of psychology has experienced for some time. This could be due to an actual paradigm shift within psychology. Could psychology be evolving into a more biologically oriented discipline, into the natural science that William James had envisioned 100 years ago? Has psychology come full circle to its beginning? Is psychology becoming no more than the scientific study of brain states, of mental processes, of consciousness? If so, what then, is the difference between psychology and neuropsychology? Is neuropsychology no more than just another way, another paradigm, for understanding behavior? Has the mind-body question, so central in the history of psychology, become the mind-brain continuum? There is little question that clinical neuropsychology is shaping the way behavior is understood. Will the field and its members rise to the occasion or continue squabbling to determine which test, battery or testing approach is best, which Board actually certifies neuropsychologists, whether lawyers have the right or privilege to distort neuropsychology by presenting only half the data?

Making History

The opportunities for neuropsychology equal or exceed those noted by behaviorism in the 1920s, humanism in the 1960s, and cognitivism in the 1970s. But making history has responsibilities (Leahy, 1986; Young, 1966): 1) Problems of knowledge are continuous and historical integrity does not allow for presentism; 2) history cannot be recorded as the Whig party did in England (i.e., use the good, discard the bad); and 3) facts of history must transcend the beliefs of individuals.

When it is all said and done, clinical neuropsychologists may be remembered as individuals who did for psychology in the 20th century what phrenologists could not do for philosophy in the 19th century; emphasizing the brain in behavior, and possibly the two as one.

SUMMARY AND CONCLUSIONS

I have taken the liberty to provide a personal and biased perspective of our field. For this opportunity, I sincerely thank each of you. There are many limitations in clinical neuropsychology. However, to focus on those limitations or

to become entrenched will only have a negative impact on ourselves, our field, and those we seek to serve. I believe that clinical neuropsychology will be judged not by what we have done thus far but by what we will do in the future. I am cautiously optimistic that there are enough among us that will strive to achieve such a lofty goal.

REFERENCES

- Ardila, A., Roselli, M., & Ostrosky, F. (1992). Sociocultural factors. In A. E. Puente & R. J. McCaffrey (Eds.), *Handbook of clinical neuropsychological assessment*. New York: Plenum.
- Ardila, A., Roselli, M., & Puente, A. E. (in press). *Clinical neuropsychological assessment of the Spanish — speaker*. New York: Plenum.
- Bigler, E. (1991). Neuropsychological assessment, neuroimaging, and clinical neuropsychology: A synthesis. *Archives of Clinical Neuropsychology*, 6, 113–132.
- Butters, N. (1992). Memory revisited. *Archives of Clinical Neuropsychology*, 7, 285–295.
- Chute, D. L., Conn, G., DiPasquale, M. D., & Hoag, M. (1988). Prosthesis ware: A new class of software supporting the activities of daily living. *Neuropsychology*, 2, 41–57.
- Costa, L. (1988). Clinical neuropsychology: Prospects and problems. *The Clinical Neuropsychologist*, 2, 3–11.
- Cripe, L. I. (1991). History of training programs in clinical neuropsychology — 1991. *The Clinical Neuropsychologist*, 5, 226–337.
- Crook, T. H., & Larrabee, G. J. (1992). Normative data on a self-rating scale for evaluating memory in everyday life. *Archives of Clinical Neuropsychology*, 7, 41–51.
- Descartes, R. (1650). *Les passions de l'ame*. Amsterdam. Translated by E. S. Haldane & G. R. T. Ross (1931), *The philosophical works of Descartes*. Cambridge, UK: Cambridge University Press.
- Faust, D., Guilmette, T. J., Hart, K., Arkes, H. R., Fishburne, F. J., & Davey, L. (1988). Neuropsychologists' training, experience, and judgment accuracy. *Archives of Clinical Neuropsychology*, 3, 145–163.
- Flesher, S. (1990). Cognitive habilitation in schizophrenia: A theoretical review and model of treatment. *Neuropsychology Review*, 1, 223–246.
- Franzen, M. (1989). *Reliability and validity in neuropsychological assessment*. New York: Plenum.
- Goldstein, K. (1940). *Human nature in the light of psychopathology*. Cambridge: Harvard University Press.
- Gross, S. J. (1978). The myth of professional licensing. *American Psychologist*, 33, 1009–1016.
- Guilmette, T. J., & Giuliano, A. J. (1991). Taking the stand: Issues and strategic in forensic neuropsychology. *The Clinical Neuropsychologist*, 5, 197–219.
- Guilmette, T. J., Faust, D., Hart, K., & Arkes, H. (1990). A national survey of psychologists who offer neuropsychological series. *Archives of Clinical Neuropsychology*, 5, 373–392.
- Hartlage, L., Chelune, G., & Tucker, D. (1981). Survey of professional issues in the practice of clinical neuropsychology. Paper presented at the annual meeting of the American Psychological Association.
- Hartlage, L. C., & Telzrow, C. F. (1982). The practice of clinical neuropsychology in the U.S. *Clinical Neuropsychology*, 2, 200–202.
- Heaton, R. K., Grant, I., & Matthews, G. C. (1991). *Comprehensive norms for an expanded Halstead — Reitan Battery*. Odessa, Fla: Psychological Assessment Resources.
- Heaton, R. K., & Pendleton, M. K. (1981). Use of neuropsychological tests to predict adult patient's everyday functioning. *Journal of Consulting and Clinical Psychology*, 49, 807–821.
- Henninger, P., & Puente, A. E. (in press). Collected writings of Roger Sperry. New York: Plenum.
- Hogan, D. B. (1983). Professional regulation. *Law and Human Behavior*, 7, 99–101.
- James, W. (1890). *Psychology*. New York: Henry Holt.
- Kaplan, E. (1983). Process and achievement revisited. In S. Wapner & B. Kaplan (Eds.), *Towards a developmental psychology*. Hillsboro, New Jersey: Laurence Erlbaum.
- Kaplan, E. (1991). *The WAIS-R as a neuropsychological instrument*. San Antonio: Psychological Corporation.
- Kessler, R. (1970). The A.M.A. and the supply of physicians. *Law and Contemporary Problems*, 35, 267–283.
- Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago: University Chicago Press.
- Lakatos, I. (1978). *The methodology of scientific research programs*. Cambridge, England: Cambridge University Press.
- LaRue, A. (1992). *Clinical neuropsychology and the aging process*. New York: Plenum.
- Leahy, T. H. (1986). History without the past. *Contemporary Psychology*, 35, 648–650.
- Lewin, K. (1954). Behavior and development as function of the total situation. In L. Carmichael (Ed.), *Manual of Child Psychology*. New York: Wiley (on 918–970).
- Lezak, M. (1983). *Neuropsychological Assessment* (2nd ed.). New York: Oxford.
- Lezak, M. (1988). Brain damage is a family affair. *Journal of Clinical and Experimental Neuropsychology*, 10, 111–123.
- Lichstein, L. (1985). On aphasia. *Brain*, 1, 433–484.
- Matarazzo, J. D. (1990). Psychological assessment versus psychological testing: Validation from Binet to the school, clinic, and courtroom. *American Psychologist*, 45, 999–1017.
- McCaffrey, R. J., & Isaac, W. L. (1984). Survey of the educational backgrounds and specialty of instructors of clinical neuropsychology in APA-approved graduate training programs. *Professional Psychology: Research and Practice*, 15, 26–33.
- Meier, M. J. (1974). Some challenges for clinical neuropsychology. In R. M. Reitan & L. A. Davison (Eds.), *Clinical neuropsychology: Current status and application*. (pages 289–323). New York: Wiley.
- Mishkin, M. (1982). A memory system in the monkey. *Philosophical Transactions of the Royal Society of London (Biology)*, 298, 85–95.
- Morton, J. (1984). Brain-based and nonbrain-based models of language. In D. Caplan, A. R. Lecours, & A. Smith (Eds.), *Biological perspectives in language*. Cambridge, Massachusetts: MIT Press.
- O'Hara, C. C., & Harrells, M. (1991). *Rehabilitation with brain injury survivors*. Gaithersburg, MD: Aspen.
- Parson, O. A. (1991). Clinical neuropsychology 1970–1990: A personal view. *Archives of Clinical Neuropsychology*, 6, 105–112.
- Posner, M. I. (1978). *Chronometric explorations of the mind*. Hillsdale, N.J.: Laurence Erlbaum.
- Puente, A. E., & McCaffrey, R. J. (Eds.) (1992). *Handbook of clinical neuropsychological assessment*. New York: Plenum.
- Puente, A. E. (1990). Historical perspectives in the development of neuropsychology as a professional specialty. In C. R. Reynolds & E. Fletcher-Janzen (Eds.), *Handbook of child clinical neuropsychology*. New York: Plenum.
- Puente, A. E., Matthews, J. R., Williams, J. M., & Matthews, L. H. (1991). Integrating clinical neuropsychology into the undergraduate curriculum. *Teaching of Psychology*, 18, 17–21.
- Putnam, S. H., & DeLuca, J. W. (1990). The TCN Professional Practice Survey: Part I: General practice of neuropsychologists in primary employment of private practice settings. *The Clinical Neuropsychologist*, 4, 199–243.
- Reitan, R. M. (1988). Integration of neuropsychology theory, assessment, and application. *The Clinical Neuropsychologist*, 2, 33–349.
- Reitan, R. M., & Wolfson, D. (1984). *The Halstead-Reitan Neuropsychological Battery*. Tucson, AZ: Neuropsychology Press.
- Report of the INS — Division 40 Task Force on Education, Accreditation, and Credentialing (1987). Guidelines for doctoral training programs in clinical neuropsychology. *The Clinical Neuropsychologist*, 1, 29–34.

- Saunders, P. T. (1980). *An introduction to catastrophe theory*. Cambridge, UK: Cambridge University Press.
- Seretny, M. C., Dean, R. S., Gray, J. W., & Hartlage, L. C. (1986). The practice of clinical neuropsychology in the United States. *Archives of Clinical Neuropsychology*, 1, 5-12.
- Spreen, O., & Strauss, S. (1991). *A compendium of neuropsychological tests*. New York: Oxford University Press.
- Tarter, R. E., Van Thiel, D. H., & Edwards, K. L. (1988). *Medical neuropsychology: The impact of disease in behavior*. New York: Plenum.
- Wedding, D., & Faust, D. (1989). Clinical judgment and decision making in neuropsychology. *Archives of Clinical Neuropsychology*, 4, 233-268.
- Williams, M. J. (1990). *Memory Assessment Scale*. Odessa, Florida: Psychological Assessment Resources.
- Wilson, B., Cockburn, W., Baddeley, & Hiorns, R. (1989). The development and validation of a test battery for detecting and monitoring everyday memory problems. *Journal of Clinical and Experimental Neuropsychology*, 11, 855-870.
- Young, R. M. (1966). Scholarship and history of the behavioral sciences. In A. C. Crimble and M. A. Hoskin (Eds.), *History of science* (vol. 5). Cambridge: W. Heffer & Sons.