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Historical Perspectives in the Development of Neuropsychology as a Professional Psychological Specialty

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The growth of neuropsychology, and clinical neuropsychology in particular, has been rapid though poorly documented. Although clinical neuropsychology texts provide overviews on theories of brain function, only a few review how the field developed. This lack of information is not typical of related disciplines (e.g., neurology) or of other specialties within psychology (e.g., clinical psychology). Clinical psychology, for example, has experienced rapid growth over the past 25–40 years and its development is well documented (Fox, 1982; Fox, Barclay, & Rogers, 1982).

Documentation is helpful for a variety of reasons. First, students must be provided with a comprehensive analysis of the discipline's development. Historical perspectives should serve as foundation for a more comprehensive appreciation of current trends and limitations. Similarly, health professionals not directly involved in the field should have a clearer understanding of our techniques and trends, if not for the professional welfare of clinical neuropsychology, at least for the welfare of consumers serviced by the discipline. Finally, and becoming increasingly important, documentation must be available to individuals outside of health care who are in a position to affect the discipline through funding and legislation.

This chapter chronicles and critiques the development of clinical neuropsychology as a professional or practitioner specialty in psychology. A brief history of research and clinical developments precedes a discussion of the growth of publications, organizations, and continuing education activities in clinical neuropsychology. Recent trends in professional practice, certification, and credentialing are also addressed. The chapter concludes with suggestions for maximizing the growth and efficacy of the field.

Historical Perspectives in the Development of Neuropsychology

Localization of brain function has been the focus of philosophers, physiologists, and psychologists for many centuries. Around 400 BC, Hippocrates attempted to correlate his behavioral observations with what he knew about anatomical localization; this was conjecture because he was legally and socially prohibited from dissecting the human body, especially the cranium. Later, Aristotle (not Plato) surmised that the heart was the seat of the mind. Almost 600 years after Hippocrates, Galen shifted the site of the mind to the brain. Clarification of overall mind function was later offered by Descartes who suggested that the soul was localized in the pineal gland. In 1810, Gall described cortical localization of function through the concept of phrenology.

Flourens and Broca introduced more accurate observations of brain function during the mid 19th century, forcing physiologists to research localization of function more systematically and with more precise measurement tools. This research was informed by early recordings of brain function or dysfunction which can be traced to at least the 17th century (Gibson, 1962) when several cases describing

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traumatic brain injury were documented. Precise experimental, rather than observational, analysis began with the electrical stimulation work of Fritsch and Hietzig in 1790. New scientific techniques were introduced to the study of brain function by one of Catell's students, Sheperd Franz, during the early part of this century. While in Washington, D.C., Franz taught Karl S. Lashley who, in turn, advanced the understanding of brain–behavior relationships as well as the theory of equipotentiality. During the mid 20th century, Nobel laureate Roger Sperry and colleagues extended this earlier work by developing procedures for experimentally examining disconnection syndromes.

As noncultural variables have traditionally been attributed little value in neuropsychological information, it is surprising to note that different approaches to the application of neuropsychological knowledge have developed across three major cultures, i.e., North America, Russia, and Great Britain.

The approach to clinical neuropsychological understanding in Russia grew from the classical psychophysiological reflexive studies of Pavlov and other Russian physiologists (Bechtereva, 1978). Clearly the best recognized individual to apply this orientation to clinical assessment of neuropsychological dysfunction was A. R. Luria (1902–1977). According to Luria (1970), there are two basic principles that guide assessment of brain dysfunction: localization of brain lesions and analysis of psychological activities associated with brain function. The Russian approach to assessment is based on a qualitative, rather than quantitative or psychometric method. Specifically, this approach attempts to provide a "clinical description using flexible but systematic sets of tests" (Luria & Majovski, 1977, p. 962). The foundation for this flexible approach is based on the concept that strong individual differences preclude development of accurate norms. Empirically derived analyses cannot replace a comprehensive understanding of brain or individual patient functioning. Each client presents with an individual set of symptoms; thus, individual hypotheses and experiments must be performed. Observation of form and content, replication, and flexibility of thinking are central to this approach.

Whereas the methods of Luria represent the historical foundations for the clinical application of neuropsychological principles in Russia, Henry Head and Hughlings Jackson represent the foundation for British approaches to clinical neuropsychology. According to Beaumont (1983), British clinical neuropsychologists favor the "individual-centered normative approach." Such an approach builds on the uniqueness of the individual and on the complexities of syndromes by tailoring the assessment. However, unlike the Russian methods, the British approach does rely on psychometric tests. An evaluation may begin with the Wechsler Adult Intelligence Scale and proceed to the Wisconsin Card Sorting Test, Halstead Category Test, or Trail Making Test, depending on the functions that are to be examined. Gaps in the assessment are filled with more experimental (i.e., poorly standardized) and individual tasks. A final yet important aspect of the British approach is the shift from strict localization (which is central to Luria's approach) to an understanding of behavioral and psychological deficits.

Canadian and American or North American approaches to clinical neuropsychology have historical roots in the work of Franz and Lashley in Washington, D.C. However, the clinical or applied study of brain dysfunction in the United States could be traced back to Kurt Goldstein. Goldstein's (1939) approach to the study of brain dysfunction was similar to that of Luria's in the sense that he did not use psychometric tests and that an extensive clinical case study was favored over short, structured contacts (Hanfmann, Rickers-Ovsiankina, & Goldstein, 1944).

Early psychometric approaches to brain assessment can be traced to Babcock (1930). However, it was Ralph Reitan who launched clinical neuropsychology in North America toward the now-accepted psychometric tradition. In his seminal paper in 1955, he indicated that the purpose of a neuropsychological evaluation was to measure deficits accurately in a standardized psychometric fashion. An interesting comparison of Reitan's and Luria's approach to brain assessment is found in Diamant (1981). An extension of Luria's approach into the psychometric realm of brain assessment served as the foundation for the work of Golden, Hammeke, and Purisch (1980) with the Luria–Nebraska Neuropsychological Battery. Although numerous criticisms have been leveled at this battery and approach (Adams, 1980), the battery continues to be used and with increasing regularity (Seretny, Dean, Gray, & Hartlage, 1986; Lubin, Larsen, Matarazzo, & Seeven, 1986). Although neuropsychology as a field of investigation has a long past, formal efforts in clinical neuropsychology have a more recent onset and more of a divergent geographical origin. Nevertheless, the discipline has recently made significant strides toward the understanding of brain function from both research and clinical perspectives.

Journal and Book Publications

The proliferation of head-injured World War II veterans into Veterans Administration domiciliary settings occurred with the rapid growth of clinical psychology. Such growth was steady though not necessarily remarkable through the 1950s and 1960s. This growth is well chronicled in research and clinical studies published in various journals. For example, Reitan's (1955) classical psychometric study of head-injured adults appeared in the *Journal of Comparative and Physiological Psychology* (*JCPP*). However, by about 1950 well over 70% of the studies in *JCPP* used the Norway rat and close to 80% of the studies dealt either with conditioning and learning or with reflexes and simple reaction patterns (Beach, 1950). In many respects, Reitan's article was not mainstream physiological psychology.

To document publication trends, all clinical neuropsychological citations in *Psychological Abstracts*, *Biological Abstracts*, and *Index Medicus* as well as in three separate computer searches were chronicled. The trend of published articles approximates two articles per year until about 1960. From 1960 until 1975, a sharp rise in publication rate occurred with an average of 28 articles per year. Between 1974 and 1985 the rate continued to rise sharply to about 66 articles per year. These articles were found in a wide variety of esoteric and interdisciplinary journals; to date, 161 different journals have published articles on neuropsychology. The journals publishing the most articles include (in alphabetical order) *American Journal of Psychiatry*, *Clinical Neuropsychology/International Journal of Clinical Neuropsychology*, *Cortex*, *International Journal of Neuroscience*, *Journal of Clinical Neuropsychology/Journal of Clinical and Experimental Neuropsychology*, *Journal of Clinical Psychology*, *Journal of Consulting and Clinical Psychology*, *Neuropsychologia*, and *Perceptual and Motor Skills*. The *Archives of Clinical Neuropsychology*, *The Clinical Neuropsychologist* and *Neuropsychology* are new to the field, exclusively publishing clinical neuropsychological studies, and have not been in existence long enough to have been listed but should certainly achieve such status quickly.

Until recently, the two major neuropsychological journals addressing clinical issues were *Clinical Neuropsychology* (*CN;* now *International Journal of Clinical Neuropsychology*) and *Journal of Clinical Neuropsychology* (*JCN;* now the *Journal of Experimental and Clinical Neuropsychology*). In an interesting study of publication trends, Ryan, Georgemiller, and Hymen (1982) analyzed the affiliation, geographic region, and context of manuscripts published between 1979 and 1983 in these journals. Whereas the University of Nebraska represented 11.3% of articles in *CN*, a wide variety of universities (e.g., City College of New York) were represented in *JCN*. Southern and north central states were the geographic origin of articles in *CN*, whereas northeastern states and Canadian locations were better represented in *JCN*. Furthermore, institutional contribution did not overlap from one journal to the other. *CN* was found to be more assessment oriented (e.g., Luria–Nebraska Neuropsychological Battery) whereas *JCN* focused more on methodological and theoretical articles, 17.1 and 30.2% of articles, respectively. In summary, Ryan *et al.* (1982) suggested that "one journal (*CN*) will become more identified with practical issues while the other (*JCN*) will deal more with academic interest."

Georgemiller, Ryan, and Setley (1986) later surveyed 115 sites offering neuropsychological training and asked the directors to rate the value of neuropsychology-related journals. In order of perceived importance were *Journal of Clinical and Experimental Neuropsychology*, *Journal of Consulting and Clinical Neuropsychology*, *Clinical Neuropsychology*, *Cortex*, *Archives of Neurology*, *Brain*, *Brain and Language*, *Journal of Clinical Psychology*, and *Archives of General Psychology*.

If one examines book publishing, similar growth patterns emerge. Prior to the 1970s, application of neuropsychological principles was rarely covered in clinical psychology or related texts. However, such books as Lezak's *Neuropsychological Assessment* (1976) and Golden's *Diagnosis and Rehabilitation in Clinical Neuropsychology* (1978) during the 1970s and more recently Filskov and Boll's *Handbook of Clinical Neuropsychology* (1981) and Wedding, Horton, and Webster's *The Neuropsychology Handbook* (1986) have introduced this "new" field to clinical and nonclinical psychologists. Several publishing companies have mounted intensive efforts in the field and one, Plenum, has developed a book series entitled Critical Issues in Clinical Neuropsychology. This *Handbook* is one of the first books to be published in the series.

Wedding, Franzen, and Hartlage (1987) recently reported the number of clinical neuropsychology books published yearly from 1960 to 1986. Between 1960 and 1967 an average of less than one book was published per year. Twenty years later the average number published per year was well over 10, with close to 25 books published in 1986. This pro-

liferation of books and journals shows no indication of slowing.

Professional Organizations

Along with the proliferation of published findings has been the development of three major organizations representing clinical neuropsychology. The International Neuropsychological Society (INS) was established in 1970 by individuals of varying disciplines interested in neuropsychological issues. In 1973 the first meeting of INS was convened in New Orleans. Such well-known clinicians as Benton, Butters, Goldstein, Hartlage, Kinsbourne, Mirsky, Pribram, Rourke, and Satz dotted the small yet robust program. Others, such as Fred King, now director for the Yerkes Primate Research Center in Atlanta, represented more academically oriented disciplines such as physiological psychology and the neurosciences. From the 1970 membership of 175 (mostly from North America), INS has grown to 2000 members worldwide representing a variety of disciplines, including speech pathology, clinical neurology, and neuropsychology. Of these, over 600 reside outside of the United States. To accommodate the large number of non-North American members, INS now holds two meetings per year—one in North America and the other in Europe. Over 800 attended the 1987 USA meeting (Washington, D.C.) with a smaller number attending the European meeting (Barcelona, Spain).

According to Hartlage (1987), the National Academy of Neuropsychologists (NAN) evolved from a group of INS and APA members interested in developing a separate organization with national representation as well as focusing on the professional aspects of neuropsychology. The first formal meeting was held in August 1976 at the Washington School of Psychiatry. Robert Woody, the first president of NAN, was instrumental in initiating a newsletter, *Gram-ma*. W. Lynn Smith chaired the next meeting held in cooperation with the annual APA meeting. In 1981, NAN met independent of APA in Orlando, Florida, with approximately 220 individuals registered. Since Orlando, NAN has met in Atlanta, Houston, San Diego, Philadelphia, Las Vegas, and Chicago (1987). Registration for the Chicago meeting exceeded more than 350 and membership in the organization is currently nearing 1000. Although members reside in many different countries, including Australia and several countries in Europe, membership is largely composed of individuals from the United States and Canada. Most members are practicing, rather than academic, professionals and a large majority are involved in direct service, typically in private practice settings. NAN membership requirements include specific training and experiential components rather than the simple interest criteria of INS.

Division 40 of the APA (Division of Clinical Neuropsychology) was formed in 1980 to serve the growing interest of APA members in clinical neuropsychology. Initially, APA members from other divisions (e.g., 6 and 12) joined to petition for this Division. As of January 1986, the Division had 49 fellows, 1829 members, and 153 associates with rapid growth expected to continue.

Ancillary divisions within APA as well as numerous non-APA groups have also experienced growth indirectly associated with clinical neuropsychology. The Association for the Advancement of Behavior Therapy has members interested in clinical neuropsychology as does Divisions 38 (Health Psychology) and 6 (Physiological and Comparative Psychology). In nonpsychologically oriented organizations, similar growth has been observed in groups such as the Society for Neuroscience. Finally, it is worth noting that although not associated with specific national or international organizations, geographically limited groups have surfaced throughout the United States and abroad. Groups in New York, Philadelphia, California, and Puerto Rico (to name a few) have been formed to serve more local needs. One particular group, the Philadelphia Neuropsychological Society, has recently launched its own journal. Thus, strong evidence exists that organizations in clinical neuropsychology are and, most likely, will continue flourishing.

Continuing Education

Though a relative newcomer to the discipline, another area of growth in clinical neuropsychology has been continuing education and the freestanding workshop. These activities have served as a central focus in providing training for clinical neuropsychologists. Recent examples of these workshops include: mild head injury in New York; Luria–Nebraska in Chicago; traumatic head injury in Braintree, Massachusetts; head trauma in Kansas City; dementia in Baltimore; behavioral neurology and neuropsychology in Lake Buena Vista, Florida; and head injury rehabilitation in Williamsburg, Virginia. Many of these freestanding workshops now also have free communications or poster sessions as part of the program.

Although these freestanding workshops often sharpen the skills of professionals, they potentially pose significant complications (e.g., retraining involves more than workshops). To avoid these pitfalls, Meier (1987) outlined the concept of "Learning and Assessment Center" for clinical neuropsychology practice to define personal insufficiencies and to provide the necessary knowledge, scientific or professional, to respecialize in clinical neuropsychology. Educational materials would be based on identified knowledge, skills, and attention needed to practice and provide an advanced level of proficiency.

The information to be disseminated could take one of several forms including workshops, conventions, and published materials. However, of the specific modalities of professional information, some forms of dissemination appear to be more efficient than others. For example, Allen, Nelson, and Sheckley (1987) reported on continuing education activities of Connecticut psychologists. Books and contacts with other professional psychologists were the most favored continuing education activities, with books rated as the most valuable. Surprisingly, the average respondent read 9.9 books, 3.8 journals, and attended 2.5 workshops and 2.2 conventions per year. Continuing education activities appear to be critical in the development of professional practice and to date, numerous opportunities have been available for those interested in furthering their training in clinical neuropsychology.

Psychological Health Care Personnel and Practice

During the 1970s there occurred an influx of psychology personnel into the workplace. This influx has continued unabated and has affected clinical neuropsychology. According to Stapp, Tucker, and VandenBos (1985), the estimated number of psychology personnel in the United States was 102,100 in mid 1983. Of these, 61.6% were primarily providing health services, 49.2% were involved in research and 63.7% in education. Approximately two thirds of these were doctoral level psychologists, and most (both master's and doctorate level) identified themselves with clinical psychology (followed by counseling and educational psychology). University settings were the largest single category of employment for doctorates; approximately 44% of the respondents were employed primarily in direct service through independent practice, hospitals, clinics, or counseling centers. Interestingly, approximately 50% of the respondents have secondary employment, engaging in independent group or individual private practice. Of those providing health services, over half were involved in clinical activities in independent practices, clinics, hospitals, or counseling/other service settings (in order of prominence).

Although not as current as the Stapp *et al.* (1985) data, Dorken and Webb (1981) reported large increases in the number of clinical psychologists during the mid to late 1970s, supporting the trend that more and more individuals are providing health care, regardless of their primary employment. In a recent analysis of doctorate productions by subfield, the APA Committee on Employment and Human Resources (Howard *et al.*, 1986) indicated that whereas 50 years ago 70% of all new PhD recipients were in experimental psychology, in 1984 53.2% were in health services specialties. Furthermore, "the trend was for new doctorate recipients in clinical, counseling, and school psychology to increasingly assume positions in organized human service settings" (Howard *et al.*, 1986, p. 1322).

In a review of the 1982 APA's Human Resources Survey, VandenBos and Stapp (1983) provided a detailed analysis of the characteristics of practice settings of service providers, profiles of professional practice, and other aspects of independent practice. Whereas the first two issues were addressed in the Stapp *et al.* (1985) report, issues of professional practice were more comprehensively described by VandenBos and Stapp (1983). Health problems, substance abuse, mental retardation, and schizophrenia combined represented close to 50% of the types of client problems seen by health providers. In an earlier study by VandenBos and colleagues (VandenBos, Stapp, & Kilberg, 1981), about 40% of the respondents reported performing complete assessments regularly or often.

These results strongly suggest that the number of health providers is rapidly increasing and they are quickly becoming the majority of psychology personnel in the United States. Although independent practice groups or individuals appear to be enjoying the most significant growth, similar trends are seen in all health service settings (e.g., hospitals). Assuming that a significant percentage of all health service clients have organic disorders and that few health providers limit their practice to one type of service or client (VandenBos and Stapp, 1983), one may conclude that a large percentage of psychologists are involved either in therapy or in assessment of individuals with neuropsychologically based problems. According to VandenBos and Stapp (1983), "it is

interesting to note that psychologists tend *not* to specialize with specific problems or with specific age populations" (p. 1346). Thus, more psychologists will either eventually be involved in or specialize in clinical neuropsychological services.

Using Social Security Administration data as a specific example, organic clients do comprise a significant segment of general clinical practice. In fiscal years 1984 and 1985, 22.5% (or approximately 250,000 people) of all those applying for Social Security disability were mental impairment cases (Dapper, 1987). Of these, 6% were classified as organic mental disorder and 35% as mentally retarded. Retardation could be "caused" by head trauma, for example, as IQs and not etiologies of behavioral disruption are important in a disability evaluation. This accounts for between 200,000 and 300,000 potential neuropsychological clients per year. In summary, it appears that not only are more psychologists dealing with neuropsychologically impaired clients, but that a large number of mental health consumers have organic disorders.

Professional Practice

The practice of clinical neuropsychology has become increasingly popular in the last few years. Several surveys over the last 5 years have outlined the current practice of clinical neuropsychology in the United States. In 1982, Hartlage and Telzrow completed a mail survey of all members of the National Academy of Neuropsychologists. Four major content areas were covered: professional practice, tests, practice preparation, and most important figure in the history of clinical neuropsychology in the United States. From these data, one can develop a basic sense of a "typical" clinical neuropsychological practice. The mean neuropsychological evaluation time was 8 hours. Approximately 59% of the respondents used technicians. Only three tests were used by at least 50% of the respondents and these included the Wechsler Intelligence Scales (89%), portions of the Halstead–Reitan Neuropsychological Battery (56%), and the Wide Range Achievement Test (52%). The remaining tests used were (in order of descending popularity): Bender Gestalt Test, Halstead–Reitan Neuropsychological Battery, Benton Visual Retention Test, Luria Tests (Christensen or Golden versions), Wechsler Memory Scale, Memory for Designs, and the Minnesota Multiphasic Personality Inventory (MMPI). With regard to practice preparation, 78% of the respondents indicated that clinical psychology was the best preparation for delivery of clinical neuropsychology services. Finally, Benton and Golden were cited for their unique contributions to the development of clinical neuropsychology as a professional specialty.

In a more recent study, Seretny *et al.* (1986) surveyed members from APA's Division 40 (N = 314) and the National Academy of Neuropsychologists (N = 300). The purpose of the survey was essentially to follow-up earlier surveys and to expand the information available for specific aspects of professional practice settings. Private practice was reported as the primary work setting of the respondents, followed by (in decreasing order of occurrence) hospitals, medical schools, and academic settings. According to the authors, there has been a shift to private practice settings over the last 5 years. Whether this is due to academicians going into practice or new doctorate recipients choosing professional rather than academic settings, or both, is uncertain. Little has changed in terms of the average number of evaluations per month (11.13) or the average amount of time required to complete a full evaluation (7.30 hours). About half of the respondents employed technicians. The Wechsler Intelligence Scales remained the most frequently used instruments followed by the Halstead–Reitan and the Luria–Nebraska Neuropsychological batteries. Other single tests frequently used included the WRAT, Bender, and Benton, as well as the MMPI and the Wechsler Memory Scale. A wide variety of referral sources was cited. Referrals were primarily from neurologists, although neurosurgeons, psychologists, general physicians, physical rehabilitation specialists, and attorneys also referred regularly. The mean dollar amount for a complete neuropsychological evaluation was $479.30 or about $65.65 per hour. Most respondents indicated that they were involved in some nonneuropsychological activities as well as cognitive rehabilitation and forensic evaluations. These results support the fact that specific trends are surfacing in terms of tests used, time used for an evaluation, and the use of technicians. Additional longitudinal information would be useful with regard to such issues as cost of service, place of employment, and referral sources.

Ryan, Farage, and Lips (1983) identified psychological health providers in the 1981 version of the *National Register of Health Service Providers in Psychology* and the winter 1981–1982 supplement, who offered neuropsychological services in an effort to understand the geographical distribution of persons providing such service. The range noted was relatively large with the District of Columbia having one

neuropsychology provider per 42,510 persons, and South Dakota with one provider per 690,178. The top ten states in terms of per capita providers were (in rank order): California, New York, Texas, Pennsylvania, Illinois, Ohio, Florida, Michigan, New Jersey, and North Carolina. Alaska and several midwestern states had the fewest number of practicing neuropsychologists. It is interesting to note that in Indiana only 21 individuals offered neuropsychological services and only one did so in South Dakota. These states represent the geographical origins of the Halstead–Reitan (Indiana) and Luria–Nebraska Neuropsychological batteries (South Dakota).

Sladen, Mozdzierz, and Greenblatt (1986) also examined the geographical distributions of neuropsychological service providers using the same subject selection criteria as Ryan *et al.* (1983). Sladen *et al.* reported "marked disparities" in the distribution of professional psychologists providing clinical neuropsychological services. These disparities existed both among states as well as between rural and metropolitan areas. Generally, these services were offered more frequently in densely populated states and in metropolitan centers. In a related survey of 316 randomly chosen community hospitals, Anchor (1983) reported on the availability and awareness of neuropsychological services. The average hospital in the survey had 143 beds and all had emergency rooms. Only 8.5% of the hospitals offered any type of neuropsychological, neuropsychiatric, or neurological testing services.

A recent article by Molloy (1987) indicated that conditions facing neuropsychologists appear more difficult in countries outside of North America. According to Molloy, insufficient understanding, prejudicial distrust, and limited reimbursement have hampered the development of neuropsychology as a clinical specialty in Australia. However, lawyers and medical specialists appear to constitute the primary source of referrals there. Such patterns appear prevalent in other countries as well. For example, in Spain, pockets of practitioners exist only in larger cities (Madrid and Barcelona). In other countries such as Argentina, clinical neuropsychological services are essentially nonexistent.

Certification and Credentialing

Although a separate chapter on certification, training, and credentialing is found in this *Handbook*, the current models of training and credentialing have their roots in and have an impact on historical trends and, thus, warrant historical analysis.

Until the 1980s, clinical neuropsychology was not a formally recognized subspecialty in health care. Behavioral neurologists, speech pathologists, and clinical psychologists (among others) with an interest in brain dysfunction worked using informal titles, and in many cases, constructs. Realizing the need for specific professional identity in the applied field of brain dysfunction, several psychologists within several Divisions of APA, especially 6 (Physiological and Comparative) and 12 (Clinical Psychology), as well as within INS and NAN, initiated discussion for the development of guidelines that would define how a psychologist (and not an individual of a related discipline) would be identified as a clinical neuropsychologist. Prior to the development of Division 40, informal discussions were centered within INS circles. By the early 1980s, APA Division 40 had been formed, and the original group of individuals developing these guidelines split into two major factions. One group, who remained entrenched within INS, developed the American Board of Clinical Neuropsychology, Inc. (ABCN), by late 1982 for the purpose of awarding specialty diplomas in clinical neuropsychology. The initial eligibility criteria required the following:

A. Doctoral degree in psychology from a regionally accredited university
B. Licensed or certified at the level of independent practice in some state or province
C. Areas of training and experience included:
    1. Basic neurosciences
    2. Neuroanatomy
    3. Neuropathology
    4. Clinical neurology
    5. Psychological assessment
    6. Clinical neuropsychological assessment
    7. Psychopathology
    8. Psychological intervention
D. Five years of postdoctoral professional experience in psychology which could include:
    Clinical
    Research
    Teaching
    Administration
E. Three or more years of clinical neuropsychological experience defined as follows:
    1. Equivalent of at least 1 year of full time supervised clinical neuropsychology experience at the postdoctoral level (6 months may be credited for documented predoctoral

specialty internship in neuropsychology)
2. Equivalent of at least 1 year of additional experience as a clinical neuropsychologist
3. In the absence of any supervised clinical experience, the equivalent of 3 years of unsupervised postdoctoral experience as a clinical neuropsychologist

The application form also required the submission of:

1. A copy of current state license or certificate,
2. Names of two professionals who could attest to the extent, nature, and quality of your experience and competence in clinical neuropsychology.

In April 1985, Manfred Meier, the president of ABCN, announced affiliation of this group with the American Board of Professional Psychology (ABPP). According to Meier, ABPP voted on March 4–5, 1985, to add clinical neuropsychology to the existing fields of applied competency of clinical, counseling, school, and industrial/organizational psychology. As a function of its ABPP affiliation, ABCN adopted ABPP's definition of a psychology graduate program as well as adding several related requirements (e.g., APA membership). At the current time, the ABPP/ABCN examination includes a "work sample" (e.g., neuropsychological evaluation or treatment summary) as well as an oral examination. The oral examination involves analyses of the work sample, ethics, and a sample case. The written multiple-choice examination is being standardized as of this writing. The new ABCN–ABPP examination has become more refined and extensive relative to the original criteria published in 1982.

The American Board of Professional Neuropsychology (ABPN) was developed in 1982 under the direction of Lawrence Hartlage and several other ABPP members, most of whom were associated with NAN. The guidelines for the original diplomate status, which are shown below, essentially focused on relevant training and education, work with relevant populations, and supervision with a qualified practitioner. At present, the ABPN is being restructured and will probably include actual testing along with an extensive application form. The basic requirements have been as follows:

1. Minimum educational requirement is the Ph.D. (or similar doctoral degree, e.g., Psy.D., Ed.D.)
2. Licensure by a state board of psychology
3. At least 5 years' postdoctoral experience in professional neuropsychology
4. Combination of coursework; additional training such as continuing education workshops, supervised pre- or postdoctoral training; and relevant work experience to provide evidence of high degree of competence in professional neuropsychology
5. Recommendation by at least two supervisors or professional colleagues attesting to high degree of competencies in professional neuropsychology

To date, ABCN and ABPN have not made strides to merge and appear to be taking independent courses. However, regardless of the apparent split, agreement has been reached on specific guidelines for identifying requirements for clinical neuropsychology education.

To alleviate potential complications for individuals wishing to be trained in the field of clinical neuropsychology, recent guidelines have been published by INS and Division 40 (August 1986). The guidelines, in their entirety, are as follows:

> Doctoral training in Clinical Neuropsychology should ordinarily result in the awarding of a Ph.D. degree from a regionally accredited university. It may be accomplished through a Ph.D. program in Clinical Neuropsychology offered by a psychology department or medical faculty or through the completion of a Ph.D. program in a related specialty area (e.g., Clinical Psychology) which offers sufficient specialization in Clinical Neuropsychology.
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> Training programs in Clinical Neuropsychology prepare students for health service delivery, basic clinical research, teaching and consultation. As such, they must contain (a) a generic psychology core, (b) a generic clinical core, (c) specialized training in the neurosciences and basic human and animal neuropsychology, (d) specific training in clinical neuropsychology. This should include a 1800 hour internship which should be preceded by an appropriate practicum experience.
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> A. Generic Psychology Core
> 1. Statistics and Methodology
> 2. Learning, Cognition and Perception
> 3. Social Psychology and Personality
> 4. Physiology Psychology
> 5. Life Span Development
> 6. History
> B. Generic Clinical Core
> 1. Psychopathology
> 2. Psychometric Theory
> 3. Interview and Assessment Techniques
> a. Interviewing

b. Intelligence Assessment
c. Personality Assessment
4. Intervention Techniques
a. Counseling and Psychotherapy
b. Behavior Therapy/Modification
c. Consultation
5. Professional Ethics

C. Neuroscience and Basic Human and Animal Neuropsychology
1. Basic Neurosciences
2. Advanced Physiological Psychology and Pharmacology
3. Neuropsychology of Perceptual, Cognitive and Executive Processes
4. Research Design and Research Practicum in Neuropsychology

D. Specific Clinical Neuropsychological Training
1. Clinical Neurology and Neuropathology
2. Specialized Neuropsychological Assessment Techniques
3. Specialized Neuropsychological Intervention Techniques
4. Assessment Practicum Children and/or Adults in University Supervised Assessment Facility
5. Clinical Neuropsychological Internship of 1800 hours preferably in a university facility. (As per INS-Div. 40 task force guidelines). Ordinarily this internship will be completed in a single year, but in exceptional circumstances may be completed in a two-year period.

E. Doctoral Dissertation

It is recognized that the completion of a Ph.D. in Clinical Neuropsychology prepares the person to begin work as a clinical neuropsychologist. In most jurisdictions, an additional year of supervised clinical practice will be required in order to qualify for licensure. Furthermore, training at the post-doctoral level to increase both general and sub-speciality competencies, is viewed as desirable.

Post-doctoral training, as described herein, is designed to provide clinical training, in order to produce an advanced level of competence in the speciality of clinical neuropsychology. It is recognized that clinical neuropsychology is a scientifically-based evolving discipline and that such training should also provide a significant research component. Thus, this report is concerned with post-doctoral training in clinical neuropsychology which is specifically geared toward producing independent practitioner level competence, which includes both necessary clinical and research skills. This report does not address training in neuropsychology which is focused solely on research.

Entry into a clinical neuropsychology post-doctoral training program ordinarily should be based on completion of a regionally accredited Ph.D. graduate training program in one of the health service delivery areas of psychology or a Ph.D. in psychology with additional completion of a "respecialization" program designed to meet equivalent criteria as a health services delivery program in psychology. In all cases, candidacy for post-doctoral training in clinical neuropsychology must be based on demonstration of training and research methodology designed to meet equivalent criteria as a health services delivery professional in the scientist-practitioner model. Ordinarily, a clinical internship, listed by the Association of Psychology Internship Centers, must also have been completed.

A post-doctoral training program in clinical neuropsychology should be directed by a board certified clinical neuropsychologist. In most cases, the program should extend over at least a two-year period. The only exception would be for individuals who have completed a specific clinical neuropsychology specialization in their graduate programs and/or a clinical neuropsychology internship provided the exit criteria are met (see below). As a general guideline, the post-doctoral training program should provide at least 50% of time in clinical service and at least 25% of time in clinical research. Variance within these guidelines should be tailored to the needs of the individual. Specific neuropsychology training must be provided, including any areas where the individual is deemed to be deficient (testing, consultation, intervention, neurosciences, neurology, etc.).

Such a post-doctoral training program should be associated with hospital settings which have neurological and/or neurosurgical services to offer and the training should be provided in both a didactic and experiential format and should include the following:

A. Training in neurological and psychiatric diagnosis.
B. Training in consultation to neurological and neurosurgical services.
C. Training in direct consultation to psychiatric, pediatric, or general medical services.
D. Exposure to methods and practices of neurological and neurosurgical consultation (Grand Rounds, Bed Rounds, Seminars, etc.).
E. Observation of neurosurgical procedures and biomedical tests (revascularization procedures, cerebral blood flow, WADA testing, etc.).
F. Participation in seminars offered to neurology and neurosurgery residents (neuropharmacology, EEG, brain cutting, etc.).
G. Training in neuropsychological techniques, examinations, interpretation of test results, report writing.
H. Training in consultation to patients and referral sources.
I. Training in methods of intervention specific to clinical neuropsychology.

J. Seminars, readings, etc., in neuropsychology (cases conferences, journal discussions, topic-specific seminars).
K. Didactic training in neuroanatomy, neurosciences.

Additional experiential training should be offered as follows:

A. Neuropsychological examination and evaluation of patients with actual and suspected neurological diseases and disorders.
B. Neuropsychological examination and evaluation of patients with psychiatric disorders and/or pediatric or general medical patients with neurobehavioral disorders.
C. Participation in clinical activities with neurologists and neurosurgeons (Bed Rounds, Grand Rounds, etc.).
D. Experience at a specialty clinic, such as a dementia clinic or epilepsy clinic, which emphasizes multidisciplinary approaches to diagnosis and treatment.
E. Direct consultation to patients involving neuropsychological assessment.
F. Direct intervention with patients, specific to neuropsychological issues, and to include psychotherapy and/or family therapy where indicated.
G. Research in neuropsychology, e.g., collaboration on a research project or other scholarly academic activity, initiation of an independent research project or other scholarly academic activity, and presentation or publication of research data where appropriate.

At the conclusion of the post-doctoral training program, the individual should be able to undertake consultation to patients and professionals on an independent basis. Accomplishment in research should also be demonstrated. The program is designed to produce a competent practitioner in the areas designated in Section B of the Task Force Report and to provide eligibility for certification in Clinical Neuropsychology by the American Board of Professional Psychology. (1986, pp. 4–5)

As strict as these guidelines may be, they presumably are more prescriptive of how programs may develop neuropsychology tracks than descriptive of existing neuropsychology programs. For example, Golden and Kuperman (1980) surveyed all APA-approved clinical psychology graduate programs in North America in 1977. Approximately 60% of these programs offered clinical neuropsychology courses including lectures, practicums, and work placements. Interestingly, however, fewer schools were involved in neuropsychological research. Furthermore, most schools offered training by one or two staff members and relatively few had specific neuropsychology tracks.

Scheer and Lubin (1980) also published an independent survey of "training" programs in clinical neuropsychology. In this survey, the authors sampled the 627 members of INS in 1977. The results indicated that, at most, training included "minimal neuropsychological training activities associated with primary service function and allied disciplines" (e.g., neurology). Several internship programs existed at both the pre- and the postdoctoral level. Scheer and Lubin noted that a typical pattern of training involved obtaining a standard Ph.D. with 1- or 2-year postdoctoral specialization in clinical neuropsychology. Another pattern of training was to specialize in a specific Ph.D. program (e.g., clinical or neuroscience) with neuropsychological concentration. The authors reported that "notable pioneers" such as Benton, Satz, Milner, and Reitan followed this mode of training. One particularly interesting observation by Scheer and Lubin was that "notable pioneers" actually "individually designed" their curriculum. With the recent guidelines or recommendations, it would appear that such an approach would be increasingly difficult, if not impossible, to accomplish. Although Meier (1982) cogently argued for different models of education in clinical neuropsychology, it appears that such a variety of models might actually be replaced with one or two specific ones as pressure from licensing or credentialing groups becomes more defined and intensified.

The major reason for certification and credentialing the practice of clinical neuropsychology is to ensure that our clients/patients in particular, and society in general, are not harmed by incompetent or unethical practitioners (Hogan, 1983a). However, unexpected, even undesired by-products of this current trend are generally not being considered.

The first step in regulating a particular discipline is not to regulate the practitioners, but to regulate educational institutions or formal internships (Hogan, 1983b). This approach was first used in 1803 in the state of Massachusetts to regulate the medical profession (Shryock, 1967). However, Hogan (1983b) argued that despite the fact that sophistication in the licensing and certification process grows, "little evidence suggests that the quality of professional services has improved" (p. 121) (see also Kessel, 1970, and Gross, 1978). Specifically, he contended that such an approach is aimed to "eliminate competition, rather than incompetence." Second, such restrictions tend to increase the cost of services and limit the services to disadvantaged groups. According to Dorsey (1983), restrictions tend to decrease the "lower-quality and price" service that low-income individuals would be able to

use. The possibility exists, furthermore, that individuals unable to be credentialed by formal procedures would be relegated to less prestigious jobs. Another issue is that having failed to be accepted at the highest level, an individual, due to interest or necessity, would still practice out of the mainstream of clinical neuropsychology without adequate direction, information, or technique (which would be especially critical in clinical neuropsychology due to its inherent complexity and novelty). Furthermore, this trend would probably occur more frequently with minority populations. Indeed, recent statistics published by APA (Howard *et al.*, 1986) indicate that although women are becoming increasingly represented, other minorities, including blacks and Hispanics, are not. Analysis of name lists available from both ABPP/ABCN and ABPN appears to confirm this.

An alternative to such efforts is the more recent peer review system, first enacted by Congress in 1972 to monitor federally aided health care programs such as Medicare (Young, 1982). Such an approach is based on the assumption that if professional work is not acceptable, professionals would learn from their peers through defined interactive methods. Nevertheless, if testing is to be continued as a means to define clinical neuropsychology or neuropsychologists, a more accurate analysis of an individual's capabilities would be to have a certification process which is based on empirically validated situations.

As Milton Friedman so aptly indicated in 1962, "conforming to 'prevailing orthodoxy,' is certain to reduce the amount of experimentation that goes in [a discipline] and hence to reduce the rates of growth of knowledge" (p. 157). The current trend in clinical neuropsychology appears to be toward greater sophistication, efficacy, recognition, and certification. Sophistication, efficacy, and recognition are needed for the development of a healthy subspeciality in psychology. However, more "precise" certification may be, as Friedman (1962) argued, incompatible with experimentation. Such experimentation, after all, was the catalyst for our present growth and status. One way to assure such continued growth and status is to facilitate a system, in whatever way possible, that meets the needs of the public instead of protecting the public (Hogan, 1983a). This is especially true in a field such as clinical neuropsychology where the field of practice and appropriate standards of practice are being developed. Diversity and experimentation with appropriate empirical analysis and validation of what is professional or acceptable in clinical neuropsychology must be encouraged.

If certification is to be used, several methods may be applied to ensure continued and appropriate growth of our discipline (based on Hogan, 1983b). First, clinical neuropsychology practice should be narrowly defined. For example, how is clinical neuropsychology different from clinical psychology, behavioral neurology, or speech therapy? Second, standards used in defining qualified clinical neuropsychologist must be based on empirical assessment, competence, and related to actual (versus hypothetical) performance. Shimberg (1981) provided specific suggestions as to how these concerns may apply to psychology, in general, with regard to content, criterion, and construct validity of tests for psychological certification. Third, alternative paths to certification should be kept open (see also Meier, 1987, for specific suggestions on continuing education). This might include internships, postdoctoral fellowships, supervision, peer and client review, workshops, and at home/office study. Fourth, regulatory policies should be based on the representation of appropriate constituencies. This would involve clinical neuropsychologists with different approaches (even geographical locations) as well as government and possibly health care/insurance agency officials. Most of all, our clients or their representatives should also be included. Next, our goal should not be to restrict the right of a competent person to practice clinical neuropsychology, but to restrict the title clinical neuropsychologist. Finally, the consumers of our product should be educated. Psychologists, neurologists, attorneys, allied disciplines, agencies (to name but a few) who refer to clinical neuropsychologists should be educated.

According to Olson (1983), the unempirical exclusion of the competent as a legal protection of special interest ultimately has negative effects on the discipline and on society. Mahoney (1985) argued for the importance of "open and ongoing exchange" as part of the epistemological processes and that it is necessary for scientific progress in psychology. As Lakatos (1970) suggested, superseding the present by exploration and novelty (rather than assuring adherence to current orthodoxy) is critical to the development of any scientific discipline. Clinical neuropsychology has too much to offer; the need for our services, expertise, and knowledge is too critical to focus on limitations.

If such theoretical arguments do not provide enough support for the continued development of clinical neuropsychology, the work of McCaffrey and colleagues (McCaffrey, 1985; McCaffrey & Isaac, 1984) provides additional reasons to be careful about our recent trend for exclusivity. In a survey of internship instructors of clinical neuropsychology

(with low response rate), instructors fared surprisingly well on how they compared to INS/Division 40 guidelines. However, in a separate survey (with better response rate), McCaffrey and Isaac (1984) found that few instructors at the pre- or postdoctoral levels met the educational requirements of the INS/Division 40 guidelines. Possibly many of those currently providing training would themselves be excluded.

Future of Clinical Neuropsychology

As Fishman and Neigher (1982) aptly noted, the 1980s (and presumably the 1990s) have been and will be an age of increasing accountability. We have taken psychology to the public, to the referral sources, to the government with an overwhelming degree of success. Indeed by the early 1980s, we were spending over $2 billion per year in the support of psychological endeavors (Fishman & Neigher, 1982). The public now wants to account for the $2 billion. One way clinical neuropsychology has provided accountability has been to provide the health marketplace with a plethora of assessment and rehabilitation techniques. The assumption has been that nonresearch or service activities have been built on a solid foundation of "scientifically derived knowledge." As altruistic and as interesting as these techniques may be, they must first be subject to the same rigorous scientific tests that other psychological and health practices (e.g., psychotherapy) have undergone.

In a review of Fishman and Neigher's (1982) activity by mission matrix of psychology's goals, it appears that clinical neuropsychology has focused over the recent years mostly on service delivery. However, much effort needs to be placed on other aspects of the activity by mission matrix of these authors. These would include, in no specific order, basic and applied research, social policy consultation, education of the general (and health care) public, training of new clinical neuropsychologists, continuing education of both general clinical and clinical neuropsychologists, and political advocacy for the discipline.

To illustrate each of these areas, examples are presented.

1. In terms of research, specific efforts must be placed on replicating existing studies (including those historically cited). Furthermore, studies that yield negative results must be considered, especially those focusing on rehabilitation.

2. In publishing, review and editorial process must become more reliable and less biased. Creative imagination must have its place next to methodological rigor.

3. Meier (1987) recognized the importance of education in the general mission of our discipline. Great care must be taken to recruit and train new neuropsychologists. Of special significance here is the alarmingly low number of minorities (including women, blacks, and Hispanics) entering the discipline. Additionally, Meier (1987) also aptly considered continuing education as critical to the continued development of those practicing in the field. This becomes especially important as larger segments of individuals in clinical, counseling, school, and physiological psychology become interested in clinical neuropsychology.

4. With regard to social policy consultation, clinical neuropsychologists must leave their clinics, hospitals, and laboratories to go to their capitols, both in the United States and abroad. One critical test of clinical neuropsychology will undoubtedly be federal legislation recognizing our discipline (see DeLeon, VandenBos, & Kraut, 1984). The public, whether it be lay and uninformed or professional and in health care settings, must be educated to the unique contribution of clinical neuropsychology. Clinical neuropsychologists have typically been sheltered from outside-institution political issues. Although establishing political ties within institutional settings is clearly an important first step, national (and possibly international) political advocacy is needed. An excellent example of this was the Horne versus Goodson case in North Carolina. In this workmen's compensation case, the testimony of a clinical neuropsychologist (the author) was considered by the initial Industrial Commission judge and later by the full Industrial Commission Board of the state as being incompetent and not credible because the injury involved physical "brain damage." Despite repeated testimony and reports describing the role of clinical neuropsychology as defining behavioral (and not anatomical) dysfunction, the pleas went unneeded. With the assistance of both the North Carolina Psychological Association and the American Psychological Association, a comprehensive amicus brief was submitted on behalf of the claimant when the case was appealed to the North Carolina Court of Appeals. While the decision (North Carolina Court of Appeals, 1986) and amicus (American Psychological Association, 1986) are available elsewhere, the decision was overruled. In the dissenting opinion, Judge Phillips stated that it was erroneous to assume "that only doctors of medicine can make more reliable deductions as to conditions in the brain." According

to Judge Phillips, "psychology is the study of the human mind and how it works and . . . the brain controls conduct, thought, speech, feeling and judgment" (p. 2). Such decisions are clearly necessary as clinical neuropsychology will be increasingly tested in the courtroom and beyond.

Clinical neuropsychology has made significant strides in recent times, both in terms of contribution, as well as recognition in the area of brain dysfunction. However, extreme cases must be taken to ensure continued growth and development. This chapter chronicles some of our successes and pitfalls. We must bear in mind, as Smith (1979) and Costa (1983) have, that clinical neuropsychology is indeed "a discipline in evolution." Our history remains in our future.

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