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The History of Clinical Neuropsychology in Israel

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Abstract and Keywords

The history of clinical neuropsychology in Israel has been affected by both the worldwide development of the field of neuropsychology, which began in the 1970s and provided the conceptual and theoretical frameworks of clinical neuropsychology, and by the social implication of the unique geopolitical situation of the state of Israel. These circumstances led to a great need for neuropsychological rehabilitation services initially for veterans and later for civilians. While European and American influences are evident in the scientific knowledge of neuropsychology and neuropsychological assessment, Israel has been pioneering, creative, and original in neuropsychological rehabilitation. Israel's contributions are reflected in the research conducted on various aspects of rehabilitation that has exploited an advantage that exists in Israel—the long-term follow-up of individuals after traumatic brain injury (TBI). This research has, in turn, encouraged the formation of graduate programs and training facilities for clinical neuropsychology at most of the universities in Israel.

Keywords: Israel, clinical neuropsychology, rehabilitation, traumatic brain injury, TBI

For the most part, the development of clinical neuropsychology in Israel began in parallel with its development in the western world, but the development of clinical neuropsychology in Israel varied to some degree due to the unique history of the country. This chapter describes both the developments of clinical neuropsychology in Israel that paralleled those that occurred in the West and the unique contributions of Israel to the development of neuropsychological rehabilitation.

Western Developments and Israeli Development

The formation of clinical neuropsychology as a discipline that is distinct from both psychology and neurology began during the late 1960s (Bilder, 2011). A clear indication of the formation of clinical neuropsychology is the 1967 founding of the International Neuropsychological Society (INS) in the United States. Subsequently, additional neuropsychological organizations were established, such as the National Academy of Neuropsychology (NAN), which was founded in 1975. In 1980, the Division 40 for Clinical Neuropsychology was officially established within the American Psychological Association (APA). In 2008, all the European neuropsychological societies joined together as the Federation of the European Societies of Neuropsychology (ESN).

The classical works of Alexander R. Luria that appeared during this period were among the first writings to provide the initial conceptual framework for this field (Luria, 1966, 1973). During the 1970s, a few clinical neuropsychology curricula that trained for diagnosis and treatment began to appear, at least in the West. Over the years, the number of universities offering a doctoral program in neuropsychology increased significantly in the United States, Western Europe, and Australia. In parallel, centers began to open in the same places, and neuropsychological diagnoses and rehabilitation were offered primarily for individuals suffering from moderate-to-severe TBI (Boake & Diller, 2005). During these years, an infrastructure began to be developed in the United States for treating the many soldiers that returned from the Vietnam War with severe brain injuries (for review, see Raymont, Salazar, Krueger, & Grafman, 2011).

Social and Geopolitical Developments in Israel and the Development of Israeli Clinical Neuropsychology

Similar to the developments that occurred in the western world, and preceding those western developments in some respects, the first budding efforts concentrated on clinical neuropsychology appeared in Israel in the early 1970s. These processes resulted from the merging of two primary factors: (1) the influence of scientific developments in the West and the former Union of Soviet Socialist Republics (USSR), which were “imported” to the country by students and investigators who had completed their studies in neuropsychology abroad and returned to Israel; and (2) the influence of social welfare policy and the extensive defense activity that has characterized this country since its establishment (1948). In terms of social welfare policy, Israel had, and still maintains, a clear social-democratic orientation. The country was established as a welfare state and has gradually implemented this policy for more than 60 years while constantly expanding its welfare legislation. Over the course of its existence, Israel has had an array of public health insurance programs that climaxed in the mid-1990s with the passage of the National Health Insurance Law (1994) which included neuropsychological rehabilitation and treatment. However, even prior to the passage of that law, every citizen in the country was, *de facto*, insured with rather inexpensive health insurance that covered most health needs, including physical rehabilitation and neuropsychological assessment and provided high quality treatment similar to that of western countries. In the 1950s, the National Insurance Law took effect (1953) and assured full coverage of vocational rehabilitation processes (for several years) for anyone recognized as a having a handicap, including neurological handicaps. This combination of inexpensive health insurance and eligibility for vocational rehabilitation funded by the National Insurance Institute (NII) constitutes the welfare foundation on which clinical neuropsychology developed in Israel’s civilian sector. One of the reasons for the high taxation rates characteristic of this country is this comprehensive welfare policy.

Along with this country’s socialistic welfare policy, geopolitically, Israel has been engaged in a constant struggle for the security of its existence since its founding. In Israel’s earliest days, the man who would become its first Prime Minister, David Ben Gurion, set an ethical standard of immense import according to which the state’s security is the obligation of the people, and the state is obliged to care for its soldiers and citizens in case they are injured while defending Israel’s security. Military service in Israel is a relatively lengthy obligation (currently 3 years). Afterward, soldiers can expect approximately 20 more years of obligatory reserve duty that occupies about one month per year. Furthermore, since 1970, civilians injured in military hostilities or terrorist acts and anyone injured in the course of any military activity are eligible for rehabilitation that is fully funded by the state. By that same ethical standard, Ben Gurion also determined that eligibility for the rehabilitation of soldiers and military personnel would take

precedence over any legislation related to the rehabilitation of regular civilians in terms of depth and the length of eligibility. The rehabilitation of soldiers (regular or reserve duty) remained, by law, the responsibility of the Defense Ministry’s Rehabilitation Department; as such, and in sharp contrast to the civilian sector, there are almost no limits to the resources and relevant means that can be provided for an individual’s rehabilitation. Thus, it is not surprising that, like the United States after the Vietnam War and after its involvement in the Middle East over the last two decades, important developments in clinical neuropsychology were initiated by the well-funded rehabilitation services of the Defense Ministry’s Rehabilitation Department, and these developments have also spilled over into the civilian sector.

Thus, in general, diagnosis, treatment and rehabilitation and, in particular, neuropsychology are deeply involved in the Israeli national ethical standard, which found its full expression in both the practice of civilian neuropsychology and, unquestionably, in the practice of neuropsychology involving war casualties and victims of terror.

Neuropsychological Rehabilitation of Adults until the Yom Kippur War (1973)

As described in an earlier survey on the development of neuropsychology in Israel (Vakil, 1994), the first signs of the clinical application of neuropsychology began in the early 1970s. Two of these signs were the establishment of joint initiatives between the Defense Ministry's Rehabilitation Department and the psychology departments at Bar Ilan University and Tel Aviv University and the establishment of a third initiative at the Loewenstern Rehabilitation Center. At Tel Aviv University, a neuropsychological unit for treatment and research was established by 1971 and was fully supported by the Rehabilitation Department of the Defense Ministry by a research grant that was intended to test the effectiveness of psychological and cognitive treatment for patients who had sustained brain injuries. The background for this unit's establishment was the cooperation created earlier between the Rusk Institute of Rehabilitation Medicine at the New York University (NYU) Medical Center under the auspices of Prof. Leonard Diller and Prof. Yehuda Ben-Yishay (an Israeli psychologist who lived and worked in New York), who later became the world pioneers in the area of the neuropsychological rehabilitation of people with brain injuries. The head trauma unit at the Rusk Institute of Rehabilitation Medicine at the NYU Medical Center was one of first institutions to adopt cognitive models for neuropsychological rehabilitation, and these were quickly "imported" to Israel for the behavioral and cognitive treatment of soldiers with moderate to severe head trauma. The intervention techniques used constituted a synergistic product of scientific developments in both the neuropsychological and behavioral domains. A further, larger scale initiative was the establishment of the Rehabilitation Center for the Brain Injured in Jaffa. This center is a sheltered workshop for soldiers with severe TBI that is funded by the Rehabilitation Department of the Defense Ministry and administered scientifically and professionally by the faculty of the graduate program in Rehabilitation Psychology at Bar Ilan University. Professors Soli Katz and Shlomo Kravetz, who established the graduate program at Bar Ilan University and the Rehabilitation Center in Jaffa, earned their doctorates in rehabilitation psychology in the United States. New perspectives in psychological rehabilitation were reflected in this unique Rehabilitation Center. In practice, these new perspectives were the foundation upon which rehabilitation psychology developed during those years in Israel. At the Loewenstein Rehabilitation Center, which is currently the largest rehabilitation hospital in the Middle East but at the time was a hospital for the chronically ill, concurrent neuropsychological assessments and treatment activities for patients with chronic brain trauma began.

Neuropsychological Rehabilitation of Adults after the Yom Kippur War (1973)

The aftermath of the Yom Kippur War brought significant stimulation to the development of rehabilitation services. In addition to the war's dire social and political significance, it left behind a relatively large number of regular and reserve soldiers with various degrees of brain trauma. The professional developments described in the preceding section constituted a naturally appropriate substructure for both a quantitative and qualitative upgrade. The Loewenstein Rehabilitation Center was designated by the Health Ministry to be the national center for rehabilitation hospitalization for individuals with acquired brain damage (traumas, cerebrovascular accidents [CVAs], and diseases of the nervous system). This center currently treats more than 300 hospitalized and ambulatory children, adults and elderly persons suffering from TBI, CVA, degenerative diseases, and spinal cord injuries. The center also has a unique department for the treatment of patients in states of prolonged loss of consciousness. This center covers nearly the entire necessary range of rehabilitation from situations of prolonged unconsciousness to promoting ambulatory and functional independence to enable patients to return to the community while being aided by treatment provided by the follow-up system (this system includes medical and neuropsychological treatment) in the framework of ambulatory care. This rehabilitative continuum enables stable, enduring contact between the patients and a staff that gets to know the patient well over time, which prevents unnecessary transitions that impede steady progress in many cases. The originality of this model has also been demonstrated by several case report studies of the characteristics of acquired brain trauma and their influence on the individual and his or her significant others. These case reports were carried out in an era in which such studies were still relatively rare in the neurological rehabilitation field (Najenson et al., 1974; Groswasser, Mendelson, Stern, Schechter, & Najenson, 1977; Najenson, Groswasser, Mendelson, & Hackett, 1980).

Further important developments in the neuropsychological rehabilitation systems began during this period outside of medical frameworks, i.e., rehabilitation in the community. The cooperation between the Rehabilitation Department of the Ministry of Defense and the Rusk Institute of Rehabilitation Medicine at the NYU Medical Center became much more intense. A combined clinical research project was initiated. In this project, two groups of 15 soldiers with head injuries were treated in two different types of ambulatory neuropsychological care centers. One branch of this study operated in the Loewenstein Rehabilitation Center and strongly emphasized interdisciplinary treatment. A detailed description of this center may be found in the reports of Stern (1991) and Groswasser and Stern (1990). The second branch of this study, directed by Prof. Ben-Yishay and rehabilitation professionals from the Rusk Institute in Israel, was established at "Beit HaLohem," a facility for the social and welfare activities of the IDF Disabled Veterans Association. In this part of the study, a more transdisciplinary, holistic approach was emphasized. A detailed description of this center can be found in the studies of Ben-

Yishay et al. (1978) and Hoofien & Ben-Yishay (1982). The Loewenstein branch of this study constituted the basis for what is currently the Day Treatment Rehabilitation Center of the hospital.

The “Beit HaLohem” branch of the study gradually developed to became the National Institute for Rehabilitation of the Brain-Injured. Based on the holistic approach to neuropsychological rehabilitation that initially underlay this study, many similar programs were later established in the Western world, including the programs founded by George P. Prigatano in Phoenix, Arizona, and Anne-Lise Christensen in Copenhagen, Denmark, and also included the head trauma unit at the Rusk Institute of Rehabilitation Medicine of the NYU Medical Center, which is directed by Prof. Ben-Yishay. The similarity between these programs is considerable, and they are based on a holistic, intensive and group/social trans-disciplinary approach. Later in the late 1970s, the National Institute became a civilian unit, and the connection with the Rusk Institute of Rehabilitation Medicine at the NYU Medical Center was concluded.

The National Institute now provides rehabilitation for approximately 250 patients with brain injuries each year, most of whom are traffic or work accident victims. The Institute operates on a national basis and includes three branches throughout the country that provide five main clinical-neuropsychological services: neuropsychological-rehabilitation assessment; a comprehensive day center for neuropsychological rehabilitation; pre-vocational preparatory workshops; individual treatment; and a sheltered workshop. The scientific and professional foundation of the National Institute is based on the neuropsychological, neurocognitive, and psychodynamic approaches. The goal of treatment is to return patients to a full vocational, family and community life. The varied treatment services that the National Institute provides are intended to offer a solution for any type of intervention (from a partial to intensive) required that is fully compatible with the abilities and rehabilitation needs of the patient. The National Institute conducts research into the development of assessments, treatment methods and interventions that benefit the long-term outcomes of neuropsychological rehabilitation (Hoofien, 2011). The first international scientific meeting in Israel on the topic of neuropsychology was organized by the National Institute in 1985 and constituted the basis of the development of work and research associations that included Israeli rehabilitation neuropsychologists and their colleagues abroad. A book entitled *Rehabilitation of the Brain-Injured Person: A Neuro-psychological Perspective,* edited by Vakil, Hoofien, and Groswasser (1990), was based on the proceeding of this meeting.

The Rehabilitation Center for the Brain-Injured in Jaffa gradually increased the number of its clients, moved into a larger facility, and began to serve brain-injured IDF veterans exclusively. Today approximately 50 IDF disabled veterans who suffer from severe brain injuries are treated at the center. These patients suffer from physical, behavioral, cognitive and emotional handicaps that prevent their integration into the open job market. These patients require a constant vocational framework that other rehabilitation facilities, such as those just described, are not capable of providing (Katz, Glatzer, & Kravetz, 1978). The array of treatments offered in this center is similar to that of a

sheltered workshop and is based on two primary guidelines: providing meaningful and significant activities and providing maximal autonomy to patients. Thus, both vocational and social needs receive adequate responses. Additionally, all rehabilitants are accompanied by supportive emotional treatment and, when necessary, family members are also treated. The interdisciplinary staff at this center conducts a variety of vocational social activities to promote the quality of life of the center's clients. About half of the rehabilitants visit the center five days per week, and about half visit between one and four days per week. Arguably, one of the most important characteristics of this center is that rehabilitants are accepted for life and view the center as their place of employment until they retire, which differs from other rehabilitation centers that accept rehabilitants for a limited period with the goal of preparing them for reintegration into the vocational world.

The developing wave of neuropsychological rehabilitation centers in those years also affected the private sector. In the 1980s, a group of clinical neuropsychologists set up a private clinic for neuropsychological rehabilitation of brain trauma victims. The treatment approach of this center is described in the reports of Gross (1982); Gross and Schutz (1986); and Klag, Gross, Ben Nachum, Moed, and Fishman (1991). Most of the patients who are treated at this clinic are designated for rehabilitation in the community and provided with psychological, cognitive and family therapy and job placement on an individual basis. Over time, these activities of the private sector expanded, and currently, the private sector provides serves nation-wide through four private clinics that operate with a similar approaches throughout the country.

Developments in the 1980s and 1990s and the Current Status of Adult Rehabilitation

The mounting demand for professionals in the neuropsychology field prompted the graduate Ph.D.s from Canada and the United States to return to Israel, which provided the basis for opening academic training programs in this field and for additional public services in the area. During the 1980s and 1990s, additional medical departments for brain injury rehabilitation were opened in the Sheba Medical Center at Tel HaShomer, at the Herzog Medical Center in Jerusalem and at the Re'ut Hospital in Tel Aviv.

The Sheba Medical Center (Ministry of Health) is the largest medical center in Israel. By the 1970s, a department for neurological rehabilitation was in operation; this department mainly specialized in rehabilitating veterans with spinal cord injuries from the Six Day War (1967). Based on this department, an array of departments for the rehabilitation of patients with head injuries was established in the 1990s. Currently these departments include a department for post-acute neurological rehabilitation and a day treatment center.

At that time, the Herzog Medical Center operated as a department of psychogeriatric rehabilitation; routine neuropsychological diagnostic and treatment services had begun. Details of this activity can be found in the report of Katz (1991). Similarly, the Re'ut Medical Center, which had actually been a hospital for the chronically ill until the 1990s, also began to accept patients in the acute stage of recovery from brain trauma and, in parallel, began to provide neuropsychological assessments and treatment.

Thus, to summarize the progress of the last 40 years, Israel now has a diverse array of neurological and neuropsychological rehabilitation services that covers nearly the entire spectrum of the needs of brain damaged adults both in terms of severity and the type of treatment required. As just described, there are inpatient departments, short- and long-term outpatient institutes, and post-acute clinics in the community. Notably, over the last two decades, institutes that deal exclusively with assessment, such as the unit for behavioral neurology at the Rambam Medical Center in Haifa, have been established.

Most of the departments and institutes provide neuropsychological assessment and rehabilitation services to disabled both veterans and civilians. Thus, despite its relative smallness, the historical development of clinical neuropsychology in Israel is characterized by a variety of public and private neuropsychological rehabilitation services for military personnel and civilians. These services are provided for individuals with the most severe injuries who are unable to fully return to community life and for people with lesser injuries who require support for a limited period of time. The majority of these services are covered by national or other public insurance, and when necessary, are provided free of payment. The treatment orientation of these departments and different organizations are highly similar. This similarity is likely related to the fact that most of the senior professionals in this field (currently no more than 50 individuals) were trained academically and professionally in the same centers, maintain close working contact and cope with similar bureaucratic and professional issues. There are two lines of similarity among the various treatment approaches:

1. Emphasis is placed on a holistic approach or the multi-dimensional treatment of the patient. A considerable portion of these programs, especially in the later stage of rehabilitation, are organized as a "therapeutic milieu" to enable intervention across different levels of the patients' lives (Katz & Florian, 1991).
2. Long-term interventions (i.e., interventions lasting months to several years) are provided for mild and moderate cases, and life-long interventions are provided in the most severe cases. The commitment to long-term treatment enables optimal responses to patients' needs as those needs change throughout the patients' adult years.

Pediatric Clinical Neuropsychology

Similar to the involvement of clinical neuropsychology in the rehabilitation of adults, its involvement in the rehabilitation of children is highly influenced by the national policy for education and welfare. In addition to the health insurance aspects discussed regarding adults (which also apply to children), Israel is characterized by the Free Compulsory Education Law (currently from age 3 on). Thus, there is much professional overlap between the facilities for the hospitalization, assessment and treatment of children with neurological injuries and the education system. For example, each long-term inpatient department for children is obligated to maintain a school in which the children participate during hospitalization. There is a complex system for the special education of emotionally, behaviorally or intellectually challenged children, and there is also clinical neuropsychological activity in this system.

Nearly 10 years after the development of adult clinical neuropsychological activity this knowledge began to be applied to children and can be dated from the early 1980s. Children's neuropsychology in Israel began with the integration of neuropsychologists who had been trained primarily in the United States into the neuropediatric clinics of the Sha'arei Zedek Hospital in Jerusalem (Gross-Tsur, Shalev, Wertman-Elad, Landau, & Amir, 1994) and the Beilinson Medical Center in Petach Tikva. The primary focus then, as it is today, was the assessment of children with various neurological syndromes. In the 1990s, a specialized hospital for children was established (the Schneider Center in Petach Tikva) in which neuropsychological assessments, individual treatment and family counseling were provided (Ariel & Sadeh, 1996). In that period and somewhat later, two rehabilitation departments designated for children were also established at the Sheba Medical Center and the Loewenstein Rehabilitation Center. An additional center (Alyn Hospital, Jerusalem), which was formerly a hospital for polio and CP, became a holistic rehabilitation center that provides assessment and therapeutic neuropsychological services. In these departments, clinical neuropsychologists provide assessments and individual and family therapy. Clinical neuropsychology in Israel also assists live brain surgeries for the early detection of epileptic foci (Andelman, Fried, & Neufeld, 2001). Israel does not actually have designated units for the long-term outpatient treatment of children because, according to law, once the children conclude their hospitalization, they return to their regular or special educational system. In these frameworks, children with congenital or acquired neurological syndromes are treated by a diverse, structured system of educational psychology services into which, especially in recent years, many clinical neuropsychologists who specialize in learning disabilities have been integrated.

To summarize, pediatric clinical neuropsychology has developed in Israel since the 1980s. This development entailed, and continues to entail, a more traditional type of neuropsychological involvement in the medical system, primarily for the sake of providing assessment and counseling services to families. There are no designated programs in

Israel for children’s neuropsychological rehabilitation system because all patients are treated within the regular or special educational system.

Academic Training, Specialization, and Professional Practice in Neuropsychology in Israel

Until the early 1980s, there were clinical or rehabilitation psychologists that dealt primarily with assessment and neuropsychological rehabilitation in the rehabilitation frameworks described here. These psychologists accumulated a great deal of clinical experience, especially in the rehabilitation and treatment of individuals with TBI, but lacked formal training because neuropsychology programs were unavailable in Israel.

Upon the return of several psychologists who had studied neuropsychology in graduate schools in the United States, Canada, and the former USSR (from the late 1970s through the 1990s) in the late 1980s and early 1990s, master’s degree programs in neuropsychology began to open at different universities. It should be noted that because Israel is a relatively small country, it was decided that another formal specialization track (i.e., approved by the Ministry of Heath) beyond those that already existed should not be formed. Hence, clinical neuropsychology is practiced in Israel under the formal umbrella of rehabilitation psychology or clinical psychology.

Neuropsychology is currently studied in graduate programs for clinical-rehabilitation neuropsychology at the Hebrew University in Jerusalem and at the Tel Aviv-Jaffo College and in the clinical-rehabilitation program at Bar Ilan University in Ramat Gan. Neuropsychology is also studied in graduate programs in clinical psychology at Ben Gurion University in the Negev and Haifa University. In all of these programs, students take introductory and advanced courses in neuropsychology, brain and cognition, and neuropsychological assessment. Altogether, up to 40 neuropsychologists matriculate from these programs every year, and some continue to with advanced Ph.D. studies.

Specialization in rehabilitation psychology and neuropsychology within that field are defined in Israel by the Psychology Law that was passed in 1977. Five treatment specializations are defined by law: clinical, rehabilitation, medical, developmental and educational. The law recognizes whoever has completed a master’s program in a recognized academic program as a psychologist. By law accreditation in each of these specializations requires an additional four years of internship in a licensed institution, hospital, clinic, or educational facility. The law defines three levels of expertise in psychology: intern, certified and supervisor. The processes of authorizing, licensing and regulating the profession are supervised and regulated by the Ministry of Health. When the law was passed, an initial nucleus of approximately 20 supervisors certified in rehabilitation psychology was recognized. Most of these supervisors were already

practicing clinical neuropsychology. Based on that nucleus, further generations of interns, experts and supervisors entered this field. At present, the majority of clinical neuropsychologists are employed in public neurological rehabilitation departments and institutes or the educational system. The number of certified experts and supervisors in this area is estimated at approximately 80. Of these experts and supervisors, approximately 15 are involved in academic research and clinical work. Over the last 20 years, professionals from allied fields such as occupational therapy, speech pathologists, neuropsychiatry and behavioral neurology have also begun to acquire knowledge in the field of neuropsychology through workshops and academic courses, but the bulk of clinical work in this field remains in the area of psychology. Knowledge that has accumulated in Israel, primarily in the field of the rehabilitation of acquired brain traumas, has earned attention in other places in the world in the form of the extension of guest lecture invitations to Israelis.

As already mentioned, the first Israeli convention for neuropsychology was organized by the National Institute for Rehabilitation of the Head-Injured in 1987 (Vakil et al., 1990) with the participation of scores of experts from all over the world. Later in 2000, the Israeli Neuropsychology Society was established. The purpose of this society was to encourage the scientific and clinical development of neuropsychology in Israel while encouraging the training of “scientific practitioner” professionals. As such, this society emphasized the integration of academia into the field. The society included approximately 120 members of varying seniority. Since 2000, the Society has held an annual one-day meeting, the location of which rotates between Israel’s universities and large colleges. The meetings’ programs reflect the Society’s goals and combine basic research reports with case presentations and clinical studies in neuropsychology. Notably, approximately 20 Israeli neuropsychologists are currently members of the INS. At the time of the writing of this chapter, planning for a mid-year 2014 INS conference in Israel is under way. Additionally, a conference on physical medicine is held annually, and many neuropsychology research studies are also presented at this conference.

Approaches and Methods of the Clinical Neuropsychologist in Israel

In terms of historical development, clinical neuropsychology in Israel was influenced primarily by European and American knowledge in the area of neuropsychological assessment, but clinical neuropsychology in Israel has been pioneering, creative and original throughout its years of neuropsychological rehabilitation and treatment, although these facets of Israeli clinical neuropsychology have not always been expressed in scientific publications.

Assessment:

The most common assessment approach in Israel throughout the years has been comprehensive and, as such, has made use of a wide variety of tests, interviews and questionnaires. The neuropsychological assessments that have been frequently used in Israel include assessments of all areas of the patient's life that are not necessarily directly connected to brain injury. These assessments usually include a detailed anamnesis, a description of behavior, a detailed cognitive assessment, and a personality assessment (for review, see Vakil, 2012).

Cognitive assessment:

Israel is a country of approximately 6.5 million residents, half of whom are native Hebrew speakers, and the others have mother tongues of Arabic, Russian or Amharic. Native English speakers are a tiny minority; thus, the building of a comprehensive test battery that was validated for the culture and local language to place neuropsychological assessment on a firm scientific basis was clearly needed. Unfortunately, that battery has not been built. Due to a lack of research resources and the relatively small size of the target population, the majority of the existing assessment tools in this field are based on direct translations of British or American testing tools that begin with the literal content and end with the norms to which the persons' performance is compared. This is particularly true in the area of adult evaluation, and less so in the area of diagnosing children with brain trauma. The large batteries of the Wechsler Scales for the evaluation of intelligence and memory in adults are wholly or partially employed by comparison of the original norms in English rather than local norms. Similarly, other psychological and neuropsychological tests for evaluating verbal abilities, executive functions, etc., have not undergone validation and local normalization to the extent required for full neuropsychological assessment. Attempts to overcome these difficulties have been made but only on a small scale. Among others, the Rey Auditory Verbal Learning Tests (AVLTs) for adults and children (Vakil, & Blachstein, 1997; Vakil, Blachstein, & Sheinman, 1998; Vakil, Greenstein, & Blachstein, 2010), the verbal fluency test (Kavé, 2005), the Word Memory Test, (Hegedish & Hoofien, 2012), the Patient's Perceived Competency Scale (Hoofien & Sharoni, 2006), the norms for children's Test of Attention (Vakil, Greenstein, & Blachstein, 2010) and, recently, the Delis-Kaplan Executive Function System Sorting Test (DKFS; Heled, Hoofien, Margalit, Natovich, & Agranov, 2012) have been validated and normalized.

Because they are subordinated to the Education Ministry, assessments for children have fared somewhat better. The WISC battery has, over the years, undergone validation and normalization on local samples, but even in this area, tests have been added that have not undergone proper scientific conversion into Hebrew. Regarding content, it is difficult to differentiate between the Israeli approach to cognitive diagnosis and that used in other Western countries, which is apparently the result of the fact that a large proportion of the

senior neuropsychologists in Israel received their education in the United States and work closely with professionals that are mostly located in the United States. Although Israel benefited from the significant immigration of educated people from the former USSR, the traditional approaches that arose there, such as Luria's Neuropsychological Investigation approach, were not actually adopted.

Personality Assessment:

The psychodiagnostic tradition in Israel combines European, South American and North American influences. As such, the diagnostic tools used for personality assessment include symptom inventories, such as MMPI and SCL-90, and projective tests, such as the TAT, the Bender Gestalt and the Draw a Person test. Some of the personality questionnaires have undergone systematic adaptation into Hebrew. Given the security circumstances in which Israel has existed over many long years, the development that has taken place in the diagnosis of PTSD has been relatively great. Questionnaires that check for this disorder are included in the majority of neuropsychological rehabilitation batteries used in Israel.

Treatment:

Neuropsychologists in Israel deal primarily with three areas of individual and group intervention: emotional treatment (Guggenheim & Lesser, 1990) cognitive treatment (Vakil & Sheleff, 1990), and assessment. In rehabilitation hospitals, rehabilitation departments, clinics, and institutes, clinical neuropsychologists usually serve as case managers for patients with acquired brain injuries and, as such, they are responsible for all aspects of intervention and rehabilitation. In many cases, the clinical neuropsychologist's responsibilities also include counseling and couple or family therapy.

Psychotherapy:

The prevailing therapy approach in Israel originally began with a clearly dynamic-psychoanalytic orientation and, in recent years, has undergone a process of change toward the integration of dynamic, primarily supportive and existentialistic therapy and behavioral approaches such as cognitive behavioral therapy (CBT). Therapy is most often combined with drug treatment provided by psychiatrists. The unique aspect of neuropsychological rehabilitation in Israel is that, in most treatment settings, nearly every patient with a neurological deficit receives individual psychotherapy throughout his/her rehabilitation period. The therapeutic approach employs results from the interactions between the severity of mental sequelae from which the individual suffers and the therapeutic orientation used by the rehabilitation facility. Thus, there is considerable variability between patients and facilities that ranges from functionally and behaviorally focused approaches to approaches that concentrate on emotionally coping

with injuries and, frequently, with emotional difficulties that existed prior to the injury. As explained in the previous sections, the duration of hospitalization and treatment in hospital clinics and outpatient institutes is relatively long and is measured on the scale of months and years. Moreover, IDF disabled veterans are entitled to lifelong treatment. These facts enable a variety of long-term therapeutic interventions and prevent the placement of any constraints on short interventions. Israel is a relatively small country, and geographic mobility is limited; thus, the majority of patients continue to live with or close to their nuclear family even after marriage. Thus, the involvement of the couple and the nuclear family in the patient's life is considerable and long term (Florian & Katz, 1991). The majority of patients' families are therefore already involved prior to hospitalization and are involved afterward in family counseling and, frequently, in couple's or family therapy. These interventions generally adopt a systems approach and are performed clinical social workers.

Cognitive therapy:

According to the holistic approach characteristic of clinical rehabilitation neuropsychology in Israel, a strong emphasis is placed on remediation of cognitive abilities. Indeed, the neuropsychological rehabilitation programs in Israel were among the first in the world to introduce individual and group cognitive training for the people with head injuries (Ben-Yishay et al., 1978, Hoofien, 1987). Particularly interesting developments included group treatments in the areas of memory (Vakil & Sheleff, 1990) and day-to-day problem solving (Gross, 1982). The currently dominant treatment approach integrates the treatment for basic deficiencies (e.g., attention, memory, executive functions) and focused attention on daily functions with a compensatory approach. Of course, the technological progress in this area has not bypassed the country. During the last decade, several cognitive therapy programs have been developed at high levels of complexity. In some hospitals and institutes, cognitive rehabilitation is conducted by occupational therapists, and in others, it is conducted by clinical neuropsychologists. This situation guarantees greater synergistic integration of the psychotherapeutic process wherein both treatments work toward the joint purposes of increasing awareness and reaching the optimal level of functioning possible given the objective handicaps.

Clinical Neuropsychological Research in Israel

Historically, clinical neuropsychological research in Israel has been influenced by the fact that Israel was among the first countries in which special rehabilitation centers were developed for individuals with brain trauma. This fact was made evident as early as the late 1970s when both descriptive and longitudinal research examining the long-term sequelae of brain injury and the effectiveness of treatment techniques began to be published. Currently, there are centers for brain research that address basic research

(physiology, biology, and chemistry), computational neuroscience and brain imaging in most Israeli universities. In parallel, extensive research activity is conducted in a variety of general neuropsychological areas and in the clinical area in particular both inside and outside of these centers. Similarly, there is research activity in the various hospitals and in the rehabilitation centers that address neuropsychology in areas that reflect the clinical work in these places.

The scopes of neuropsychological research are quite varied; some of these centers address aspects of rehabilitation and exploit the long-term follow-up of individuals after brain trauma that is available in Israel. Several research studies have been conducted on the subject of neuropsychological assessment, and some of these studies have sought to create norms for diagnostic tools in Hebrew. There have also been many studies that have dealt with the processes or deficiencies of specific cognitive abilities such as attention, memory, executive functions and hemispatial neglect. In 1981, Professor Levi Rahmani authored the first textbook of neuropsychology written in Hebrew. Pioneering research on the subject of the brain hemispheres was being conducted in Israel as early as the 1970s. Carmon and Nachshon presented the information processing distinctions between the hemispheres (Carmon & Nachshon, 1971; Nachshon & Carmon, 1975).

Physiatrists from the Loewenstein Medical Rehabilitation Center published several studies on the physiological predictors (e.g., duration of unconsciousness) of rehabilitation after severe brain trauma (Groswasser, et al., 1977; Keren, Cohen, Lazar-Zweker, & Groswasser, 2001; Najenson et al., 1980). Research examining the long-term sequelae of various rehabilitation frameworks (Katz et al., 1978) and holistic intervention methods (Hoofien, Ohry, & Rozin, 1985) and the efficacy of different cognitive interventions (Gross, 1982) have been conducted. Several studies attempted to identify cognitive and demographic predictors of the long-term consequences of brain trauma (Hoofien, Gilboa, Vakil, & Donovick, 2001; Hoofien, Vakil, & Gilboa, 2000; Hoofien et al., 2002). Many articles have been published in Israel in the field of neuropsychological assessment including review articles (Vakil, 2012) and articles on the Hebrew norms of different diagnostic tools as detailed earlier.

Later, specific emotional and cognitive disturbances resulting from diffuse head traumas or from focal traumas due to CVA were investigated in Israel. The other topics that have been investigated include the following: attention deficits resulting from brain trauma (Vakil, Weisz, Jedwab, Groswasser, & Aberbuch, 1995); hemispatial neglect due to CVA (Deouell, Sacher, & Soroker, 2005; Katz, Hartman-Maeir, Ring, & Soroker, 1999; Kaufman, Serfaty, Deouell, Ruppin, & Soroker, 2009; Morein-Zamir, Henik, Balas, & Soroker, 2005); cognitive deterioration in demented patients (Bentin, Silverberg, & Gordon, 1981); the characteristics of emotional responses after TBI (Hoofien, Gilboa, Vakil, & Barak, 2004; Hoofien, Barak, Vakil, & Gilboa, 2005; Peleg, Barak, Harel, Rochberg, & Hoofien, 2009; Sela-Kaufman, Rassovsky, Agranov, Levi, & Vakil, 2013); the consequences of traumatic brain injury on various memory processes (see Vakil, 2005 for a review); language disturbances (i.e., aphasia) resulting from brain trauma (Gil, Cohen,

Korn, & Groswasser, 1996; Schechter, Schejter, Abarbanel, Groswasser, & Solzi, 1985); and disturbances in executive functions due to brain trauma (Heled et al., 2012).

Conclusion

In this chapter, the development of clinical neuropsychology in Israel was reviewed. As this chapter has shown, Israel's security and socialistic policies, with their clear social-democratic orientation, were the motivations that created and enabled such extensive development of the clinical and rehabilitation neuropsychology services. Israel was among the nations that pioneered the development of treatment methods and specialized therapeutic frameworks for the rehabilitation of individuals after severe TBI. Today, there is an extensive system of neurological and neuropsychological rehabilitation services in Israel that meets nearly the entire range of the needs of adults with brain injuries throughout their lives in terms of both severity and the type of treatment required. The connections of rehabilitants with rehabilitation services over many years have enabled the execution of research on the long-term consequences of brain trauma, studies associated with neuropsychological diagnoses, and studies of specific neuropsychological disturbances. The need for rehabilitation neuropsychologists was also the catalyst for the creation of graduate programs in neuropsychology that emphasize clinical rehabilitation training.

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