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The Development of School Neuropsychology as a Specialty in the United States

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ABSTRACT

The emergence of School Neuropsychology as an area of specialization in the United States of America (USA) is less than 50 years old. The history of the specialization is reviewed, highlighting the pioneers, the accumulation of knowledge of the decades through publications, the development of assessment tools designed specifically for children, and the creation of training programs and credentialing boards. The objective of this chapter to expose readers to how School Neuropsychology has been practiced in the United States.

Keywords:

School Neuropsychology, pediatric neuropsychology, early pioneers, historical bibliography, neuropsychological tests

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INTRODUCTION

The focus of this article is on the history and development of *School Neuropsychology* in the United States of America (USA). History is usually defined as the study of the past or the continuous (typically chronological) record of important events or trends that make up the whole of something. Whereas genealogy is the study and tracing of lines of descent or development. Both history and genealogy have played a role in the evolution of School Neuropsychology as a field. It is important to note that School Neuropsychology is a relatively recent practice specialty within larger fields of psychology, education, and neuroscience.

Psychology grew from the disciplines of medicine and philosophy. Originally both of these fields of study, as well as early psychologists were interested in understanding brain-behavior relationships, the nature of cognition, and the role of the physical brain-body in the development of human consciousness and the soul. As a result, psychology has its roots deeply embedded in neuroscience. As psychology evolved, areas of specialty began to be defined, including counseling, clinical, developmental, educational or school, forensic, and industrial/organizational to name but a few. All of the major branches of psychology have expanded into smaller branches of specialized knowledge or skill. In the USA, there are five "practice" branches including counseling psychology, clinical psychology, school psychology, forensic psychology, and industrial/organizational psychology. Neuropsychology is also a practice branch, but it is typically subsumed under clinical or forensic psychology. A practice branch encompasses areas of training in which a professional may obtain a "license to practice" as a Licensed Psychologist in their area of expertise, beyond the achievement of a doctoral degree.

Early Contributions to the Evolution of School Neuropsychology in the 20th Century

To understand and appreciate the evolution of School Neuropsychology, the influence of adult clinical neuropsychology, pediatric neuropsychology, school psychology and educational psychology needs to be acknowledged. Modern adult clinical neuropsychology has its origins in the mid-19th century with researchers studying localization of brain functions (e.g., Jackson, Broca, Wernicke[1]). In the 20th century, war advanced the fields of both psychology and clinical neuropsychology. World War I, World War II, as well as the Korean and Vietnam wars saw major revisions to the practice of psychological assessment and clinical neuropsychology. Soldiers were returning from the battlefields at unprecedented rates with concussive and traumatic brain injuries, as well as psychological damage (e.g., post-traumatic stress disorder).

The contributions of Ward Halstead, Ralph Reitan, Alexander Luria, and Edith Kaplan to clinical neuropsychology over the course of the 20th century cannot be overstated. However, during this time little to no attention or research was focused on pediatric populations. The professional assumption was that child and adolescent brain-based behavior was similar to adults, only immature. Most of the measures used in neuropsychological assessment with children during this time were downward extensions of adult instruments, such as the Halstead Reitan Neuropsychological Test Battery[2] or the Luria Nebraska Neuropsychological Battery[3].

It was not until the mid-20th century, with advances in neuroscience and psychology, as well as a growing recognition of the unique cognitive and behavioral challenges faced by children and adolescents, that psychologists began to explore the relationship between brain function and behavior in youth[4,5]. An important contributing factor to the focus on neurodevelopmental disabilities in children and adolescents at this time was the study of learning disabilities, and subsequent special education laws mandating assessment and intervention services for children with neurodevelopmental disorders. In the USA, there are education laws (P.L. 94-142 Education for All Handicapped Children Act of 1975; P.L. 108-446 Individuals with Disabilities Education Improvement Act) and civil rights laws (Rehabilitation Act of 1973; Americans with Disabilities Act of 2010) that regulate special education services in public education for individuals with identified disabilities, which have contributed

significantly to the development of the professions of school psychology and School Neuropsychology.

A new discipline can form when two or more branches of knowledge merge and develop their own unique characteristics[6]. School Neuropsychology in the USA draws from the disciplines of psychology, school psychology, neuropsychology, developmental psychology, and educational psychology. In other parts of the world, educational psychology seems to have had a greater impact on clinical practice with pediatric populations. In the USA, the 1980s and 1990s marked a period of rapid growth for School Neuropsychology as a specialty, fueled by increasing recognition of the field's relevance to educational settings and pediatric populations.

The Major Contributions to School Neuropsychology in the 1980s

In the 1980s, School Neuropsychology was not differentiated as a specialization from the emerging specializations of child or pediatric neuropsychology. In the USA, the integration of neuropsychology principles into school psychology can be credited to George W. Hynd[7], who helped develop a pediatric neuropsychology specialization within the University of Georgia's School Psychology Doctoral Program in the early 1980s. Hynd and his students completed much of the early research in the field and promoted this area of specialization within the foundational field of school psychology.

The Pioneers in the Field of School Neuropsychology

The field of School Neuropsychology can be traced back to a few visionaries who laid the groundwork for the emerging specialization. Many were graduates from just a few university programs who became university professors themselves and carried on the passion for School Neuropsychology. They trained a new generation of scholars and practitioners who have advanced the School Neuropsychology specialization. For instance, many graduates of the University of Georgia program and mentees of Hynd went on to develop their own School Neuropsychology specializations within doctoral training programs across the U.S. (e.g., Cynthia Riccio at Texas A&M; Margaret Semrud-Clikeman at University of Texas - Austin and later University of Minnesota; Stephen R. Hooper at University of North Carolina; Morris Cohen at Georgia Health Sciences University; and W. Grant Willis at University of Rhode Island).

Other pioneers in School Neuropsychology include Jack Naglieri and Marlin Languis at The Ohio State University, who trained Daniel C. Miller; Raymond Dean at Ball State University, who trained Ric Carl D'Amato, who in turn trained and mentored Denise E. Maricle at the University of Northern Colorado. Other early pioneers in the field included Edith Kaplan, Alan Kaufman, Cecil R. Reynolds, and Richard W. Woodcock.

Major School Neuropsychology Books Published in the 1980s

During the 1980s, a steady stream of researchers, authors, and test developers advanced the specializations of pediatric and School Neuropsychology. In 1981, George Hynd and John Obrzut[8] wrote the first book for practitioners interested in School Neuropsychology entitled the *Neuropsychological Assessment of the School-Age Child: Issues and Procedures*. Hynd authored or co-authored[9, 10, 11] several other influential books over the next decade related to this emerging specialization. Several other textbooks were published in the 1980s by pioneers in the field: Byron Rourke[12] wrote *Child Neuropsychology: An Introduction to Theory, Research, and Clinical Practice*, Lawrence Hartlage, and Cathey Telzrow[13] wrote *Neuropsychological Assessment and Intervention with Children and Adolescents*, Barbara Z. Novick and Maureen M. Arnold[14] wrote *Fundamentals of Clinical Child Neuropsychology*, Michael G. Tramontana and Stephen R. Hooper[15] wrote *Assessment Issues in Child Neuropsychology*, and Cecil R. Reynolds and Elaine Fletcher-Janzen[16] wrote the *Handbook of Clinical Child Neuropsychology*.

A School Neuropsychology Special Interest Group is Established

By the late 1980s, there was enough interest being generated in neuropsychology among school

psychologists that a special interest group in neuropsychology was established within the National Association of School Psychologists (NASP). This interest group is still active and advocates for the specialization of School Neuropsychology within NASP. It has been joined by two other similar interest groups, one for traumatic brain injury and another focusing on pediatric neuropsychology.

Newly Introduced or Revised Assessments.

Despite the growing interest in School Neuropsychology, there were very few advances in the assessment tools available for practitioners at this time. The state of the art in pediatric neuropsychological assessment in the 1980s were the *Halstead-Reitan Neuropsychological Test Battery for Children* ages *9–14*[17, 18], the *Reitan-Indiana Test Battery for Children* ages *5–8*[17, 19] and the *Luria-Nebraska Neuropsychological Battery: Children's Revision*[20].

In terms of cognitive assessment, 1983 saw the publication of the *Kaufman Assessment Battery for Children* (K-ABC)[21]. The K-ABC was introduced as a new test of cognitive abilities and one of the first cognitive measures based on a neuropsychological theory (Lurian). In 1989, the *Woodcock-Johnson Psychoeducational Battery, Revised* (WJ-R)[22] was published and included the integration of Gf-Gc theory, a precursor to Cattell-Horn-Carrol (CHC) theory[23, 24, 25] as the theoretical foundation for the test. Although Gf-Gc was not developed as a neuropsychological theory, it was based on known neurocognitive functioning at that time. The K-ABC and WJ-R were among the first "theory-based" cognitive measures, and both theories provided viable explanations for cognitive functions.

The Major Contributions to School Neuropsychology in the 1990s

In the late 1990s, the fields of pediatric neuropsychology and School Neuropsychology, began to take shape as distinct specialties within clinical psychology, pediatric medicine, neuropsychology, and school psychology. This work emphasized the importance of understanding how brain development and function impacted cognitive abilities, emotional regulation, and academic performance. At the same time advances in neuroimaging technologies, such as MRI and PET scans, revolutionized the neurosciences, allowing clinicians to study brain structure and function in unprecedented detail. These imaging techniques enhanced diagnostic accuracy and facilitated longitudinal studies of brain development and recovery in children with neurodevelopmental disorders, traumatic brain injuries, and other neurological conditions.

Major School Neuropsychology Publications in the 1990s

During the 1990s, multiple first edition textbooks were written about School Neuropsychology and new assessment tools were introduced. Textbooks written by authors such as Obrzut and Hynd[26] - *Neuropsychological Foundations of Learning Disabilities: A Handbook of Issues, Methods, and Practice*, Teeter and Semrud-Clikeman[27] - *Child Neuropsychology: Assessment and Interventions for Neurodevelopmental Disorders*, and Reynolds and Fletcher-Janzen[28] *Handbook of Clinical Child Neuropsychology: Second Edition* set the foundations for knowledge and practice in School Neuropsychology. Three scholarly journals on pediatric neuropsychology were launched: *Developmental Neuropsychology*, established in 1985; *Child Neuropsychology*, established in 1995; and *Applied Neuropsychology: Child*, established in 2001.

In the late 20th century, many new neuropsychological assessment tools were published that were specifically designed for school-age children and not downward extensions of adult models[29]. These new assessment tools included tests of memory and learning, such as the *Wide Range Assessment of Memory and Learning*[30]; *Test of Memory and Learning*[31]; and the *Children's Memory Scale*[32].

In addition, the first edition of the *Cognitive Assessment System*[33] was published. Two neuropsychology batteries were published, including the *NEPSY: A Developmental Neuropsychological Assessment*[34], and the *Wechsler Intelligence Scale for Children as a Process Instrument*[35]. The majority of these tests have been revised several times over the past couple of decades[1] and are still in current use in multiple fields.

The Evolution of Training Programs in School Neuropsychology

In the USA, the entry-level of graduate training for most school psychologists is at the Specialist-level. Specialist-level training in school psychology requires a minimum of 60 graduate hours, consistent with established national training standards[36]. The graduate hours also include field-based supervised experiences (e.g., practicums and internships). Given the rigorous curriculum requirements at the Specialist-level, a specialization in School Neuropsychology is typically not possible. Thus, graduate training in School Neuropsychology is typically provided by doctoral programs. There are a limited number of school psychology and clinical psychology programs that offer specialty training in School Neuropsychology or pediatric neuropsychology respectively. These programs were generally developed and maintained by second generation faculty who were trained by the original pioneers in the field. As these second generation faculty have begun to retire, some training programs are shutting down. The field of School Neuropsychology is at a turning point waiting for the third generation of trained professionals to take the leadership in advancing the field.

As a result of these training limitations, alternative post-graduate specialization programs have been developed to fill the training void. In the mid-1990s, Fielding Graduate University in Santa Barbara, California, established a Neuropsychology Specialization Program for licensed doctoral psychologists who wanted to extend their scope of expertise into neuropsychology; however this post-doctoral training in clinical neuropsychology was predominately focused on adults.

In 1990, Daniel C. Miller was hired as a faculty member in the School Psychology graduate program at Texas Woman's University (TWU). He developed an area of specialization in School Neuropsychology and taught those courses for over 25 years. In 2002, seeing a need for broader training opportunities in School Neuropsychology, Miller developed curriculum for a comprehensive, competency-based School Neuropsychology Post-Graduate Certification Program to train school psychologists already working full time and clinical psychologists who work with pediatric populations. By 2007, Miller's School Neuropsychology program had grown from the original 3 training sites to 15 training sites scattered across the USA.

In 2008, the program shifted to an online platform. As a result of this shift to distance education, it was possible to hire a broader base of content experts to provide lectures. Offering the program via distance education also provided options for new students to take the training who may not have lived in close proximity or been able to travel to one of the regional training sites. Miller ran the School Neuropsychology Post-Graduate Training Program and the School Neuropsychology Institute for over 20 years, and with his colleagues successfully trained over 1,400 school psychologists and licensed clinical psychologists to integrate neuropsychological assessment and interpretation into their professional practice.

In addition, during this time the School Neuropsychology Institute began offering continuing education opportunities to practicing professionals and graduates of the training program. A national conference (2-3 days of professional presentations) was held each year beginning in 2006, and webinars and self-study programs have been offered online through the training website (www.schoolneuropsych.com). In 2024, leadership of the School Neuropsychology Post-Graduate Training Program, management of the annual conference, and ongoing continuing education programs transitioned to Drs. Julie Gettman and Christopher Bedford. The School Neuropsychology Post-Graduate Training Program has principally served professionals from the USA, but approximately 10% of the program graduates have been from international sites, such as Canada, Australia, Mexico, Germany, Singapore, and China. The program lectures are provided in English, but in recent years a supervision group within the program has been offered to support psychologists who provide services in more than one language and across multiple cultures.

Certification Boards for School and Pediatric Neuropsychology

In the USA, there are two specialty boards that certify adult clinical psychologists at the doctoral level, the American Board of Clinical Neuropsychology and the American Board of Professional Neuropsychology. The American Board of School Neuropsychology (ABSNP) was established in 1999 in response to the need to set standards of practice for those school psychologists and psychologists who received training in School Neuropsychology. ABSNP board certification is open to school psychologists trained at the specialist or doctoral levels, provided the applicants can demonstrate graduate or post-graduate level training and competency in School Neuropsychology. The American Board of Pediatric Neuropsychology (AAPdN) was established in 1996 to offer board certification for neuropsychologists who work with children and adolescents.

Proposed School Neuropsychology Training Standards

One indication of a mature profession is the development and application of training standards and ethical guidelines for practice. Training standards for the practice of psychology in the USA is regulated by the American Psychology Association (APA) through their accrediting body the Association of Psychology Postdoctoral and Internship Centers (APPIC). Doctoral programs and internship training programs in various areas of psychology are accredited via APA and APPIC (training programs, internships, and post-doctoral fellowships). The National Association of School Psychologists (NASP) accredits school psychology programs, primarily at the specialist level, but NASP accreditation is also needed for doctoral programs not accredited by APA.

In the USA, licensure as a psychologist is done at the state level, and each state has its own rules and regulations for the practice of psychology. Each state has a Board of Psychology that licenses practitioners. The Licensed Psychologist (LP) credential allows the practitioner the most flexibility as to where and how they can practice. The practice of school psychology in the USA is uniquely regulated. A doctoral-level school psychologist can obtain an LP in some states, but they cannot necessarily practice in the public schools. The role of school psychologist in the public schools is regulated by the Department of Education in most states, and thus, a certification as a school psychologist is required for specialist and doctoral-level school psychologists. Currently practice in the schools is restricted to those professionals (non-doctoral or doctoral) who hold a School Psychology Certification from their state's Department of Education.

In clinical neuropsychology, Division 40 of APA, developed training standards for the practice of neuropsychology (known as the Houston Guidelines). The guidelines, Specialty Education and Training in Clinical Neuropsychology, have been guiding the practice of doctoral level training of clinical neuropsychologists since 1997.

Training standards for the practice of School Neuropsychology have been proposed[1,37,38,39] and include pediatric-based competencies in the areas of neuroanatomy, brain-behavior relationships, genetic and neurodevelopmental disorders, neuropsychopharmacology, neuropsychological intervention techniques, professional ethics, neuropsychological assessment, interpretation and report writing, supervised experience via practicums and internship, and post-graduate training in pediatric or School Neuropsychology. Currently there is not a professional organization (i.e., the National Association of School Neuropsychologists) to propose, support, or revise and adopt these suggested training standards. Practitioners with expertise in School Neuropsychology must follow established training standards approved by the American Psychological Association or the National Association of School Psychologists.

The Major Contributions to School Neuropsychology in the 2000s

In the first decade of the twenty-first century, school psychologists focused on the neuropsy-

chology of academic and social-emotional functioning of school-age children. Moreover, the integration of evidence-based practices from fields such as cognitive psychology, educational neuroscience, and special education enhanced the effectiveness of interventions aimed at improving academic outcomes for students with neurodevelopmental disorders and other learning challenges.

Major School Neuropsychology Publications in the 2000s

The new century provided School Neuropsychologists a wealth of new publications and assessment tools to enhance their professional practices. Several first edition books that applied neuropsychological principles to academic disorders facing school-aged children and youth were published, including: *The Neuropsychology of Reading Disorders*[40]. *The Neuropsychology of Written Language Disorders*[41], *The Neuropsychology of Mathematics*[42], and *Integrating RTI with Cognitive Neuropsychology: A Scientific Approach to Reading*[43].

John Wiley and Sons, with Allan and Nadine Kaufman as the series editors, began publishing the Essentials series, which have become influential texts in the fields of school psychology and School Neuropsychology. In 2001, Flanagan and Ortiz[44] wrote the first edition of the *Essentials of Cross Battery Assessment,* and in 2007, Flanagan, Ortiz, and Alfonso[45] updated the *Essentials of Cross Battery Assessment – Second Edition*. In 2005, Dehn[46] wrote the *Essentials of Processing Assessment*. In 2007, Miller[37] wrote the first edition of the *Essentials of School Neuropsychological Assessment*, which introduced the School Neuropsychological Conceptual Model for cross battery interpretation of assessment data.

In 2002, Berninger and Richards[47] wrote the *Brain Literacy Book for Educators*. In 2004, Ida Sue Baron[48] wrote the influential book *Neuropsychological Evaluation of the Child*. In 2004, Hale and Fiorello[49] wrote the *School Neuropsychology: A Practitioners Handbook,* and D'Amato, Fletcher-Janzen, and Reynolds[50] edited the *School Neuropsychology Handbook*.

In 2008, Reynolds and Fletcher-Janzen[51] wrote the third edition of *Handbook of Clinical Child Neuropsychology*. In 2009, Semrud-Clikeman and Teeter-Elison[52] wrote the second edition of *Child Neuropsychology: Assessment and Interventions for Neurodevelopmental Disorders*.

Major New or Revised Assessments Published in the 2000s

Two revisions to tests of intelligence/cognitive abilities were published in the first decade of the new century: *Stanford-Binet Intelligence Scales: Fifth Edition*[53] and the *Differential Ability Scales, Second Edition*[54]. In addition, two major neuropsychology test batteries were published in the 2000s. In 2001, the *Delis-Kaplan Executive Function System*[55] was published as a comprehensive test battery designed to measure multiple aspects of executive functions. In 2007, the second edition of the *NEPSY*[56] was published. Both of these tests have been widely used in the practice of School Neuropsychology in the USA.

School Neuropsychology National Conferences

In 2006, the American Board of School Neuropsychology (ABSNP) hosted the first face-to-face School Neuropsychology national conference. The organizers of the conference have changed over the years, but the conference has been held each year. In 2025, the 20th year of the conference will be celebrated. The annual School Neuropsychology conference has been one of the main sources for obtaining continuing education (CE) training for board certified School Neuropsychologists. The conference has been a leader in bringing together nationally known scholars, researchers, and practitioners to promote School Neuropsychology.

After initial training and ABSNP board certification in School Neuropsychology it is essential that practitioners with this expertise commit to being life-long learners through ongoing continuing education. The School Neuropsychology Annual Conference was a pioneer in offering high quality continuing education in School Neuropsychology, but other organizations have followed suit. In the

past, the Nelson-Butters Conference in San Diego held an annual conference which focused on adult neuropsychology one year and alternated to a focus on pediatric neuropsychology the next year. The last year these conferences were held was in 2016. As interest grew in school/pediatric neuropsychology other professional organizations started to offer CE opportunities, such as the National Association of School Psychologists (NASP), the National Academy of Neuropsychology (NAN), the Learning Disabilities Association of America (LDA), the American Academy of Pediatric Neuropsychology (AAPdN), and the Comprehensive Assessment for Intervention (CAI) organization.

The Major Contributions to School Neuropsychology in the 2010s

In the 2010s, prominent authors continued to publish original textbooks and new assessment tools became available to practitioners. The body of knowledge related to the School Neuropsychology specialization increased exponentially.

Major School Neuropsychology Publications in the 2010s

Many new books and revisions to existing books were published in this decade. Miller[57] edited the first edition of the *Best Practices in School Neuropsychology: Guidelines for Effective Practice, Assessment, and Evidence-Based Interventions*. The Best Practices book applied Miller's[37] School Neuropsychology conceptual model as an interpretative framework for common neurodevelopmental disorders. Dehn[58] wrote *Long-term Memory Problems in Children and Adolescents: Assessment, Intervention, and Effective Instruction*. Riccio, Sullivan, and Cohen[59] wrote *Neuropsychological Assessment and Intervention for Childhood and Adolescent Disorders*. In 2010, Davis[60] edited the *Handbook of Pediatric Neuropsychology,* a comprehensive resource for practitioners.

Some of the additional books in the *Essentials* series relating to the practice of School Neuropsychology were published in this decade including, *Essentials of NEPSY-II Assessment*[61], *Essentials of Specific Learning Disabilities Identification*[62], *Essentials of School Neuropsychological Assessment, Second Edition*[38], *Essentials of Cross-Battery Assessment, Third Edition*[63], *Essentials of Executive Functions Assessment*[64], *Essentials of Processing Assessment, Second Edition*[65], *Essentials of Working Memory and Intervention*[66], *Essentials of WISC-V Assessment*[67], *Essentials of WISC-V Integrated Assessment*[68], and *Essentials of Specific Learning Disabilities Identification – Second Edition*[69].

In Miller's[38] *Essentials of School Neuropsychological Assessment, Second Edition*, he introduced the Integrated School Neuropsychology/Cattell-Horn-Carrol (Integrated SNP/CHC Model) which provided a theoretical bridge between the School Neuropsychology theories and CHC theory. In Flanagan and colleagues'[63] third edition of the *Essentials of Cross-Battery Assessment* book (2013), they introduced neuropsychological measures into their cross-battery classification. This theoretical integration between the two approaches to assessment and interpretation was a milestone in the field of School Neuropsychology.

Outside of the Wiley's *Essentials* series, several other School Neuropsychology books were published this decade including: *The Neuropsychology of Written Language Disorders*[70], *The Neuropsychology of Mathematics: An Introduction to the FAM*[71], and *Selective Assessment for Academic Disorders*[72], which introduced a modified and simplified model of CHC theory called Functional-CHC (F-CHC).

Major New or Revised Assessments Published in the 2010s

Three of the most recent versions of commonly used tests of intelligence/cognitive abilities were revised in 2014: *Wechsler Intelligence Scale for Children – Fifth Edition*[73]; the *Woodcock-Johnson IV Tests of Cognitive Abilities*[74], the *Cognitive Assessment System – Second Edition*[75]. The *Kaufman Assessment Battery for Children, Second Edition Normative Update*[76] was revised in 2018. During this decade, several new neuropsychology-based assessments were authored by Feifer which have made a significant impact on the field, including the *Feifer Assessment*

of Reading[77], the *Feifer Assessment of Mathematics*[78], and the *Feifer Assessment of Writing*[79]. Each of these tests provided school neuropsychologists with important evidence-based subtyping of academic disorders linked to evidence-based interventions[29].

The Major Contributions to School Neuropsychology in the 2020s

"The SARs CoV2 (aka COVID 19) pandemic of 2020-21 significantly slowed the publication of new resources for school neuropsychologists"[80] p. 9. The pandemic created a massive disruption to the continuity of educational experiences for children across the USA, and the long-term effects of COVID are still being determined. During the COVID shutdown, service delivery models needed modification. Wight and Raiford[81] wrote an excellent book addressing these issues called the *Essentials of Psychological Tele-Assessment*.

In 2021, Adams and Sheslow[82] authored the third edition of the *Wide Range Assessment of Memory and Learning,* an important addition to the School Neuropsychology assessment tools. In 2021, Feifer[83] wrote the third version of *The Neuropsychology of Reading Disorders: A Compendium of Research-Based Interventions.* In 2022, Dehn[84] wrote the third edition of *Essentials of Processing*. In 2022, Miller, Maricle, Bedford, and Gettman[85] edited the second edition of the *Best Practices in School Neuropsychology: Guideline for Effective Practice, Assessment, and Evidence-Based Interventions.* In this edition, Miller and Maricle's Integrated SNP/CHC Model served as the interpretative framework for 40+ years of research examining neuropsychological effects on common neurodevelopmental disorders. In 2024, the Integrated SNP/CHC Model was operationalized in a virtual software program call PsychWriter Pro[86].

Future Directions

In summary, the practice of School Neuropsychology in the USA has been characterized by exponential growth since the 1980s and continues to evolve. This confluence of knowledge about the brain, research on brain-behavior relationships, literature supporting the field, and proposed theoretical models of pediatric neuropsychology functioning and assessment combine to support the growing and vibrant specialization of School Neuropsychology as we move into the middle of the 21st century. Looking ahead, we expect to see the field of School Neuropsychology continue to evolve with ongoing advancements in neuroscience, technology, and educational research. As our understanding of brain-behavior relationships deepens, so too will our ability to develop more effective strategies for promoting academic success and psychological well-being in students across diverse learning contexts.

The history of School Neuropsychology in the USA reflects a journey of collaboration, innovation, and dedication to understanding the complex interplay between brain function and educational outcomes. By bridging the gap between neuroscience and education, school neuropsychologists contribute invaluable insights and interventions that empower students to achieve their full potential in school and beyond.

It is our hope that training standards in School Neuropsychology would be adopted by United States and international accrediting bodies and then incorporated into graduate training programs. Ultimately, we would like to see pediatric, and School Neuropsychology have the same stature as adult clinical neuropsychology. We would also recommend that practitioners seek out opportunities for continuing education in the application of neuroscience to enhance the services they deliver to children and their families. Concurrently, we would hope that more national and international organizations would recognize the need for advanced training in the application of neuroscience to practice and offer more continuing education opportunities. Although there has been an exponential increase in basic neuroscience research, there needs to be better linkage to evidence-based practices in the future.

Declaration of Interests

All of the authors receive book royalties from several School Neuropsychology books. Dr. Miller receives compensation from the sale of the PsychWriter Pro software. Dr. Bedford receives compensation in his role as the Executive Director of the American Board of School Neuropsychology, LLC. He also receives compensation as the Associate Director of the School Neuropsychology Institute.

REFERENCES

1. Miller DC, Maricle DE. Essentials of school neuropsychological assessment. 3rd ed. Hoboken, NJ: John Wiley & Sons; 2019.
2. Reitan RM, Wolfson D. The Halstead-Reitan neuropsychological test battery: Theory and clinical interpretation. Neuropsychology press; 1985.
3. Golden CJ, Arnold D, Hammeke TA. Luria-Nebraska neuro-psychological battery: (LNNB). Springfield, Illinois: Charles C Thomas Publisher; 1978.
4. Ludden D. Is neuroscience the future or the end of psychology. Retrieved from. 2017.
5. Yeung AW, Goto TK, Leung WK. The changing landscape of neuroscience research, 2006–2015: a bibliometric study. Frontiers in neuroscience. 2017 Mar 21;11:120.
6. Areekkuzhiyil S. Emergence of New Disciplines. Online Submission. Edutracks. 2017 Dec; 17(4): 20-2.
7. Hynd GW. Training the school psychologist in neuropsychology: Perspectives, issues, and models. In: Obrzut JE, Hynd GW, editors. Neuropsychological assessment and the school-age child: Issues and procedures. New York: Grune & Stratton; 1981. p. 379-404.
8. Hynd GW, Obrzut JE. Neuropsychological assessment and the school-age child: Issues and procedures. (No Title). 1981.
9. Obrzut JE. Hynd GW. Child Neuropsychology: Theory and Research and Child Neuropsychology. 1986a;2.
10. Obrzut JE. Hynd GW. Child Neuropsychology: Clinical practice. 1986b;2.
11. Hynd GW, Willis WG. Pediatric neuropsychology. Grune & Stratton/WB Saunders Co; 1988.
12. Rourke BP. Child neuropsychology: An introduction to theory, research, and clinical practice. (No Title).1983.
13. Hartlage LC, Telzrow CF. Neuropsychological assessment and intervention with children and adolescents. Professional Resource Press; 1986.
14. Novick BZ, Arnold MM. Fundamentals of clinical child neuropsychology. (No Title). 1988.
15. Tramontana MG, Hooper SR, editors. Assessment issues in child neuropsychology. Plenum Press; 1988.
16. Reynolds CR, Fletcher-Janzen E. Handbook of clinical child neuropsychology. 1989.
17. Reitan RM, Davison LA. Clinical neuropsychology: Current status and applications. VH Winston & Sons; 1974.
18. Reitan RM, Wolfson D. Neuropsychological evaluation of older children. Neuropsychology Press; 1992.
19. Reitan RM. Manual for administration of neuropsychological test batteries for adults and children. Neuropsychology Laboratory, Indiana University medical Center; 1959.
20. Golden CJ. Manual for the Luria-Nebraska neuropsychological battery: Children's revision. Western Psychological Services; 1986.
21. Kaufman AS, Kaufman NL. Kaufman assessment battery for children. Psychological Assessment. 1983.
22. Woodcock RW, Johnson MB. Woodcock-Johnson psychoeducational battery revised. Riverside; 1989.
23. Cattell RB, Horn JL. A check on the theory of fluid and crystallized intelligence with description of new subtest designs. Journal of Educational Measurement. 1978 Sep;15(3):139-64.
24. Horn JL. Organization of abilities and the development of intelligence. Psychological review. 1968 May;75(3):242.

25. Horn J. Thinking about human abilities. In Handbook of multivariate experimental psychology 1988 (pp. 645-685). Boston, MA: Springer US.
26. Obrzut JE, Hynd GW. Neuropsychological foundations of learning disabilities: A handbook of issues, methods, and practice. Academic Press; 1991.
27. Teeter PA, Semrud-Clikeman M. Child neuropsychology: Assessment and interventions for neurodevelopmental disorders. Allyn & Bacon; 1997.
28. Reynolds CR, Fletcher-Janzen E. Handbook of clinical child neuropsychology, second edition 1997.
29. Miller DC, Maricle DE. The integrated SNP/CHC model. In Miller DC, Maricle DE, Bedford CL, Gettman JA, editors. Best practices in school neuropsychology: Guidelines for effective practice, assessment, and evidence-based intervention, Second Edition. John Wiley & Sons; 2022 p. 67-85.
30. Sheslow D, Adams W. WRAML: Wide range assessment of memory and learning. Jastak Associates; 1990.
31. Reynolds CR, Bigler ED. Test of memory and learning. PRO-ED; 1994.
32. Cohen MJ. Children's Memory Scale (CMS). San Antonio: The Psychological Corporation; 1998.
33. Naglieri JA, Das, JP. Das-Naglieri cognitive assessment system. Riverside; 1997.
34. Korkman M, Kirk U, Kemp S. NEPSY: A developmental neuropsychological assessment. The Psychological Assessment; 1997.
35. Wechsler D, Kaplan E, Fein, D, Kramer, J, Delis, D. Wechsler intelligence scale for children as a process instrument. Psychological Corporation; 1999.
36. National Association of School Psychologists. The professional standards of the National Association of School Psychologists; 2020.
37. Miller DC. Essentials of school neuropsychological assessment. John Wiley & Sons; 2007 Feb 2.
38. Miller DC. Essentials of school neuropsychological assessment, Second Edition. John Wiley & Sons; 2013.
39. Maricle DE, Miller DC. School neuropsychology training and credentialing. In Miller DC, Maricle DE, Bedford CL, Gettman JA, editors. Best practices in school neuropsychology: Guidelines for effective practice, assessment, and evidence-based intervention, Second Edition. John Wiley & Sons; 2022 p. 15-40.
40. Feifer SG, DeFina PA. The neuropsychology of reading disorders: Diagnosis, and intervention, School Neuropsychology Press; 2000.
41. Feifer SG, DeFina PA. The neuropsychology of written language disorders: Diagnosis, and intervention, School Neuropsychology Press; 2002.
42. Feifer SG, DeFina PA. The neuropsychology of mathematics: Diagnosis, and intervention, School Neuropsychology Press; 2005.
43. Feifer SG, Della Taffolo, DA. Integrating RTI with cognitive neuropsychology: A scientific approach to reading. School Neuropsychology Press; 2007.
44. Flanagan DP, Ortiz SO. Essentials of cross-battery assessment. Wiley: 2001.
45. Flanagan DP, Ortiz SO, Alfonso VC. Essentials of cross-battery assessment – second edition. Wiley: 2007.
46. Dehn MJ. Essentials of processing assessment. John Wiley & Sons; 2005.
47. Berninger VW, Richards TL. Brain literacy for educators and psychologists. Academic Press; 2002 May 8.
48. Baron IS. Neuropsychological evaluation of the child. Oxford University Press; 2004.
49. Hale JB, Fiorello, CA. School neuropsychology: A practitioner's handbook. The Guilford Press; 2004.
50. D'Amato RC, Fletcher-Janzen E, Reynolds, CR. Handbook of school neuropsychology. Wiley; 2005.
51. Reynolds CR, Fletcher-Janzen E. Handbook of clinical child neuropsychology,Third edition, 2008.
52. Semrud-Clikeman M, Teeter-Ellison PA. Child neuropsychology: Assessment and interventions for neurodevelopmental disorders, Second edition. Springer; 2009.
53. Roid GH. Stanford-Binet intelligence scales (3rd ed.). Riverside; 2003.
54. Elliot CD. Differential ability scales (2nd ed.). Pearson; 2007.
55. Delis DC, Kaplan E, Kramer JH. Delis-Kaplan executive function system. Assessment. The Psychological Corporation; 2001.

56. Korkman M, Kirk U, Kemp S. NEPSY-II: A developmental neuropsychological assessment. The Psychological Assessment; 2007.
57. Miller DC, editor. Best practices in school neuropsychology: Guidelines for effective practice, assessment, and evidence-based intervention. John Wiley & Sons; 2009.
58. Dehn MJ. Long-term memory problems in children and adolescents: Assessment, intervention, and effective instruction. John Wiley & Sons; 2010.
59. Riccio CA, Sullivan JR, Cohen MJ. Neuropsychological assessment and intervention for childhood and adolescent disorders. John Wiley & Sons; 2010.
60. Davis AS, editor. Handbook of pediatric neuropsychology. Springer Publishing Company; 2010.
61. Kemp SL, Korkman M. Essentials of NEPSY-II assessment. John Wiley & Sons; 2010.
62. Flanagan, DP, Alfonso, VS. Essentials of specific learning disabilities identification, John Wiley & Sons; 2010.
63. Flanagan DP, Ortiz SO, Alfonso VC. Essentials of cross-battery assessment. – third edition. John Wiley & Sons; 2013.
64. McCloskey G, Perkins LA. Essentials of executive functions assessment. John Wiley & Sons; 2012.
65. Dehn MJ. Essentials of processing assessment, Second edition. John Wiley & Sons; 2013.
66. Dehn MJ. Essentials of Working Memory and Intervention. John Wiley & Sons; 2015.
67. Flanagan DP, Alfonso VC. Essentials of WISC-V assessment. John Wiley & Sons; 2017.
68. Raiford SE. Essentials of WISC-V integrated assessment. John Wiley & Sons; 2017.
69. Alfonso VC, Flanagan DP. Essentials of specific learning disability identification – Second edition. John Wiley & Sons; 2018.
70. Feifer SG. The neuropsychology of written language disorders: A framework for effective interventions. School Neuropsych Press, LLC; 2011.
71. Feifer SG. The neuropsychology of mathematics: An introduction to the FAM. School Neuropsych Press, LLC; 2011.
72. Woodcock RW, Miller, DC, Maricle, DE, McGill, R. J. Evidence-based selective assessment for academic disorders. School Neuropsych Press; 2017,
73. Wechsler DJ. Wechsler intelligence scale for children–Fifth Edition (WISC-V). Bloomington, MN: Pearson. 2014.
74. Schrank FA, McGrew KS, Mather N, Wendling BJ, LaForte EM. Woodcock-Johnson IV tests of cognitive abilities. Riverside; 2014.
75. Naglieri JA, Goldstein S. Cognitive assessment system, Second edition. PRO-ED; 2014.
76. Kaufman AS, Kaufman NL. Kaufman assessment battery for children, second edition normative update. Pearson; 2018.
77. Feifer SG. Feifer assessment of reading. PAR, Inc.; 2015.
78. Feifer SG. Feifer assessment of mathematics. PAR, Inc.; 2016.
79. Feifer SG. Feifer assessment of writing. PAR, Inc.; 2020.
80. Miller DC, Maricle DE. School neuropsychology specialization. In Miller DC, Maricle DE, Bedford CL, Gettman JA, editors. Best practices in school neuropsychology: Guidelines for effective practice, assessment, and evidence-based intervention, Second Edition. John Wiley & Sons; 2022 p. 9.
81. Wright AJ, Raiford SE. Essentials of psychological tele-assessment. John Wiley & Sons; 2020.
82. Adams W, Sheslow D. Wide range assessment of memory and learning (3rd ed.). Pearson; 2021.
83. Feifer SG. The Neuropsychology of Reading Disorders: A Compendium of Research-Based Interventions. School Neuropsych Press, LLC; 2021.
84. Dehn MJ. Essentials of processing assessment, Third edition. John Wiley & Sons; 2022.
85. Miller DC, Maricle DE, Bedford CL, Gettman JA, editors. Best practices in school neuropsychology: Guidelines for effective practice, assessment, and evidence-based intervention, Second Edition. John Wiley & Sons; 2022.
86. PsychWriter Pro [Internet]. Report Insights, LLC; [cited 2024 Jul 2]. Available from: https://www.psychwriterpro.com