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Integration of School Psychology and Neuropsychology: An Inquiry

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INTEGRATION OF SCHOOL PSYCHOLOGY AND NEUROPSYCHOLOGY:
AN INQUIRY

A Thesis^o

Presented to

The Graduate Faculty

Central Washington University

In Partial Fulfillment

of the Requirements for the Degree

Education Specialist

School Psychology

by

Megan Colleen Moerke

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CENTRAL WASHINGTON UNIVERSITY

Graduate Studies

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ABSTRACT

INTEGRATION OF SCHOOL PSYCHOLOGY AND NEUROPSYCHOLOGY:

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A state level survey was conducted to examine interest regarding the integration of a neuropsychological perspective into school psychology practice among practicing school psychologists in Washington State. Potential respondents were contacted through e-mail and invited to participate in the original survey developed by the author. The 25 question survey sought to answer questions regarding neuropsychological training, attitudes and beliefs toward the incorporation of a neuropsychological perspective, current professional practices, interaction with neuropsychologists through referral and consultation, and potential barriers to the incorporation of a neuropsychological perspective. A total of 433 school psychologists completed the online survey for an approximate response rate of 42%. Results found a high level of interest in receiving more training in neuropsychology. However, school psychologists continue to report potential barriers towards the incorporation of a neuropsychological perspective. Comparisons to past findings as well as potential directions for future research are discussed.

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CHAPTER I

INTRODUCTION

Neuropsychology and school psychology are often seen as distinct disciplines separate from one another. However, both disciplines share a common role of diagnosis and assessment: school psychology with children and adolescents in an educational setting and neuropsychology with children and adults historically in a clinical setting. Beginning in the 1960s, there were calls for a synthesis of the two disciplines (Gaddes, 1969). Early proponents of adopting a neuropsychological perspective with regards to school psychology sought to ascertain interest and training needs while touting the benefits of adopting such a perspective (D'Amato, 1990; Hynd & Obrzut, 1981; Obrzut, 1981). Criticism towards a premature adoption of the newly developing field of neuropsychology persisted, however (Sandoval & Haapmanen, 1981). Advocates of the merging of the two fields addressed concerns, noting potential gains from a neuropsychological perspective, including better diagnosis and treatment, as well as delineation of a student's strengths and weaknesses (Hynd, 1981a; Riccio, Hynd, & Cohen, 1993).

More recently, neuroscience and a neuropsychological perspective have been proposed to be beneficial to many categories of students typically served by school psychologists (Decker, 2008). Examples of such categories include students with traumatic brain injuries (TBIs), learning disabilities, and psychopathology as well as multicultural students. Relevant to recent trends within education, many authors have

advocated for the adoption of a neuropsychological perspective into the response-to-intervention framework (Cleary & Scott, 2011; Decker, 2008; Feifer, 2008; Hale et al., 2010; Hale, Kaufman, Naglieri, & Kavale, 2006; Schmitt & Wodrich, 2008; Semrud-Clikeman, 2005; Witsken, Stoeckel, & D'Amato, 2008).

Both specialization in neuropsychology and a consultant role have been proposed as options for school psychologists interested in pursuing further neuropsychological knowledge and involvement with neuropsychology (Hynd & Obrzut, 1981; Hynd & Reynolds, 2005; Reynolds, 2011). Specialization would likely require additional education either at the doctoral level or completion of a post-graduate certification program (Miller, 2010). Neuropsychological knowledge would be helpful in the consultant role, though not necessarily required.

Throughout the history of research into neuropsychological interest among school psychologists, questionnaire survey research has been the primary way in which attitudes and practices with regard to neuropsychology have been addressed. Research has been conducted investigating training practices of graduate school psychology programs (D'Amato, Hammons, Terminie, & Dean, 1992; Hynd, Quakenbush, & Obrzut, 1980; McGrath & Yalof, 2007 (as cited in Miller, 2010); Walker, Boling, & Cobb, 1999) as well as attitudes and practices of school psychologists (Copeland & Miller, 1985; Leavell & Lewandowski, 1988; McGrath & Yalof, 2008 (as cited in Miller, 2010); Slonaker, 2009). The current research project seeks to build upon past survey research conducted with school psychologists in an attempt to ascertain Washington state school

psychologists' training in neuropsychology, as well as attitudes and practices with regard to incorporating a neuropsychological perspective into professional practice.

Additionally, interactions with clinical neuropsychologists by school psychologists will be examined.

CHAPTER II

LITERATURE REVIEW

School Psychology

The field of school psychology can be traced back to the 1890s and has developed up until the present time incorporating principles from education and psychology, typically in the school setting (Fagan & Wise, 2007). Fagan and Wise (2007) describe the development of the field as falling into two divisions, the hybrid years and the thoroughbred years. Over the course of the field's development, the roles and functions of practicing school psychologists have diversified, though certain trends in the field remain.

The hybrid years, defined by Fagan and Wise (2007) as occurring from 1890 to 1969, were characterized by an undeveloped professional identity but common role and function. Professional identity was inconsistent throughout the United States with urban areas progressing more in this regard than rural areas. With regard to the role and function of the school psychologist, assessment and testing, using educational and psychological measures, predominated with a limited role in guiding interventions. As the hybrid years came to a close, the number of training programs and school psychologists grew, and the stage was set for the professionalism of the field.

The thoroughbred years of school psychology, defined by Fagan and Wise (2007) as occurring from 1970 to present, were characterized by a growing professionalism and recognition of the field. State and national organizations of school psychologists

developed which set guidelines for practice for their members. Training programs for school psychologists also grew in number. Core functions and roles of the school psychologist in this period included assessment and placement as well as intervention and functional assessments (Fagan & Wise, 2007).

As briefly mentioned earlier, the roles and functions of school psychologists have varied and diversified over the years, though the core features of assessment and placement have remained hallmarks of the profession. An early and influential role of the school psychologist was administering ability and achievement measures, which enabled children to be tracked into different educational programs (Fagan & Wise, 2007). This traditional role has been augmented by intervention and consultation roles, though assessment continues to play a dominant role for the majority of contemporary school psychologists. Fagan and Wise (2007) point to an emerging role in the field which builds on knowledge and experience while remaining focused on data-based problem solving.

Neuropsychology

Similar to school psychology, neuropsychology focuses on assessment, with an emphasis on brain behavior relationships. Historically speaking, the development of clinical neuropsychology has undergone shifts in focus and practice as new technology and subsequent information about the human brain has become available. Contemporary clinical neuropsychology typically involves comprehensive assessment of a wide range of cognitive domains (Kulas & Naugle, 2003). Such comprehensive assessment provides information regarding cognitive abilities and deficits, aids in diagnosis, provides

information regarding prognosis, and is useful for documenting change in cognitive functioning over time (Kulas & Naugle, 2003).

Miller (2010) describes four stages in the development of clinical neuropsychology. In the first stage, the single-test stage from 1900-1950s, attempts were made to diagnose and classify patients with or without brain damage or dysfunction based on the results of a single test. The second phase, the test battery/lesion specification stage from 1940-1980s, shifted focus to the use of test batteries in an attempt to “determine the source of possible brain dysfunction” (Miller, 2010, p. 8). The Halstead-Reitan Neuropsychological Test Battery (HRNTB) was developed during this time and became the “gold standard” in assessment (Miller, 2010, p. 9) The HRNTB was useful in assessing a range of brain dysfunction from mild to severe as well as describing functional deficits arising from brain damage (Kulas & Naugle, 2003). The Luria-Nebraska Neuropsychological Battery (LNNB) was developed during this time, as well, based upon the work of Russian neuropsychologist, Alexander Luria (Miller, 2010). The third phase, the functional profile stage from the 1970s-1990, coincided with the development of technology that allowed non-invasive imaging of the brain. In this phase, focus shifted away from attempts to deduce locations of brain pathology to identifying cognitive strengths and weaknesses (Kulas & Naugle, 2003; Miller, 2010). According to Miller (2010), the final phase, the integrative and predictive phase (1990s to present), can be characterized by the development of assessments specifically for children, continued

advancement in neuroimaging, as well as a number of advances related to assessment in the field.

As mentioned previously, contemporary clinical neuropsychological assessment involves comprehensive assessment; areas typically assessed include attention, memory, intellectual functioning, motor functioning, executive functioning, emotional functioning, visuospatial abilities, receptive and expressive language, and psychopathology (Kulas & Naugle, 2003; Silver et al., 2006). In addition to providing information regarding cognitive strengths and weaknesses, assessment results aid in specifying deficits due to brain injury as well as diagnosing disorders in which brain abnormality cannot be seen by imaging techniques, such as learning disorders (Kulas & Naugle, 2003). In relation to children, neuropsychological assessments may be helpful both when brain damage is known to have occurred and also when children fail to progress educationally despite intervention and support (Silver et al., 2006). A neuropsychological evaluation seeks to link assessment to intervention and the formation of specific recommendations for treatment (Silver et al., 2006).

Integration

As early as the late 1960s, there were calls for the synthesis of psychology and neuropsychology within the educational setting (Gaddes, 1969). Since that time, there have been various proponents for the integration of a neuropsychological perspective into school psychology practice. Integration of the two disciplines, however, has not been without controversy. Below, a brief synopsis of the early history of interest into

integration will be detailed along with criticism of such integration and how these criticisms have been addressed.

As mentioned previously, Gaddes (1969) was among the first to suggest that benefit could be gained from the synthesis of clinical neurological knowledge and education. Early proponents of integrating information from brain function into educational planning used the term neurological rather than neuropsychological, which appeared with consistency beginning in the early 1980s. Gaddes (1969) suggested that basic knowledge of neurology, including structure and physiology of the brain, could be helpful both to teachers and school psychologists. His reasoning was based upon the fact that a number of children struggle with learning problems often due to brain damage or dysfunction. Gaddes suggested that school psychologists require neurological knowledge in order to diagnose and delineate recommendations for children affected by brain dysfunction. In the case of learning disorders in particular, Gaddes advocated for training in neurology for teachers and school psychologists in order to facilitate educational planning.

After this initial call regarding the need for school psychologists to acquire neurological knowledge, Hynd and Obrzut (1981) took up the torch in the early 1980s, publishing articles regarding school psychologist interest in neuropsychology and neuropsychological assessment (Hynd & Obrzut, 1981; Obrzut, 1981). Hynd and Obrzut described an increased interest in neuropsychology among school psychologists resulting from forces both internal and external to the profession; consequently, they suggested a

potential specialization in neuropsychology for school psychologists at both the certification and doctoral level to address interest and training needs. Specifically, growing interest in neuropsychology was attributed to an awareness of the physiological underpinnings of behavior, federal legislation (PL 94-142) and subsequent decreased referrals to specialists (neuropsychologists), and school psychologists becoming more responsible for diagnosis and assessment due to fewer referrals being made. To that end, Obrzut (1981) described neuropsychological assessment procedures, which could be useful for a practicing school psychologist, including assessment categories and specific tests which should be considered.

For school psychologists interested in receiving more training and potentially implementing neuropsychological principles into their practice, Hynd and Obrzut (1981) suggested specialization in neuropsychology for doctoral students during their final years of training. Hynd (1981b) also developed a training model for certification level and doctoral level programs as well as practicing school psychologists who had completed their training.

Also at this time, interest emerged regarding the relevance of neuropsychology and behavior therapy to school-age children and school psychologists (Horton, 1981). Two disability categories, brain injury and learning disabilities, were believed to be particularly relevant to school psychological practice, and Horton described how neuropsychological assessment could be diagnostically beneficial for these two categories (1981). Horton was interested in whether neuropsychological assessment

could be used complementarily along with behavioral interventions. Though still in early stages in conceptualization, Horton believed school psychologists could benefit from behavior therapy techniques and neuropsychological assessment techniques when working with students in the schools.

D'Amato (1990) has also been a strong proponent of the relevance of neuropsychology to the practice of school psychology. Specifically, D'Amato stated that a neuropsychological perspective would be helpful for understanding both learning disorders and emotional-behavioral disorders. Applying a neuropsychological perspective to the interpretation of commonly administered school psychology assessments may yield additional information for a student (D'Amato, 1990). Since neuropsychology and school psychology share similar orientations regarding assessment and diagnosis, D'Amato believed school psychologists could benefit from training in neuropsychology; as an example, he cited a number of school psychology programs that successfully found a way to integrate neuropsychology training into their programs. While neuropsychological training could potentially offer a number of benefits to school psychologists, D'Amato believed the link between assessment and intervention to be the most promising.

Criticism and Response

Efforts to integrate a neuropsychological perspective into school psychology practice, however, have not been without criticism. Both in the early 1980's and later in the early 90's, articles appeared in recognized school psychology journals both

questioning and addressing the relevance and utility of neuropsychology to practice within the schools (Sandoval & Haapmanen, 1981; Riccio et al., 1993) . In response, advocates for integration have fired back addressing concerns that have been raised.

For example, following publications in the early 1980s noting increased interest in neuropsychology by school psychologists, Sandoval and Haapmanen (1981) critiqued the use of neuropsychology in the schools. In addition to concerns about the practicality of implementing neuropsychology within the school setting, the authors also noted concerns with possible repercussions from attributing learning problems to brain dysfunction. Most notably, the authors speculated that labeling a child's learning problems due to brain dysfunction could result in low expectations for the child coupled with a disregard for the importance of adequate instruction. Additionally, the authors noted concern that neuropsychology was more adept at finding weakness rather than focusing on a child's strengths. In conclusion, the authors stated that a premature adoption of neuropsychology in the schools might result in the development of a new phrenology and "premature applications of theory" could be dangerous (Sandoval & Haapmanen, 1981, p. 387).

As one might expect, proponents of integrating a neuropsychological perspective in the schools addressed critiques of their proposition. Hynd (1981a) responded to concerns noting that a neuropsychological perspective merely provided a more complete picture of a child's functioning, and that additional information could not help but be useful. He also stated that new labels would not be needed, but rather a neuropsychological perspective would be helpful in diagnosis and treatment. In the end,

he called for a reevaluation of professional practice considering issues noted by both perspectives.

Again in the early 1990s, concerns were addressed regarding the usefulness of neuropsychological assessment to school psychologists. Riccio et al. (1993) responded to issues which had been raised regarding differing views on whether neuropsychological assessment was useful in the school environment. While neuropsychological measures can add more information about a student and his or her condition, concerns regarding the length of time needed for such an assessment as well as reliability of assessment measures and whether children were an appropriate population for assessment had been noted (Riccio et al., 1993). The authors pointed to gains from integrating neuropsychology into school psychology noting “recognition of strengths as well as weaknesses” and an “expansion of intervention options” as being two primary benefits (Riccio et al., 1993, p. 293). In the minds of the authors, however, there were some valid concerns regarding the validity and reliability of some neuropsychological measures, which did not use large samples in their normative data. Evidence did suggest, however, that additional information was gleaned from the addition of neuropsychological assessment which could be useful for children with head injuries or conditions impacted by the central nervous system, in which case spending extra time on assessment would appear to be worth the effort. Proper training in neuropsychology was advocated, so that assessment results were valid and properly communicated to parents and other professionals.

Educational Relevance

Irrespective of controversy regarding relevance for school psychology practice, neuroscience and neuropsychology have been proposed as providing benefit for multiple categories of students. Additionally, a neuropsychological perspective has been advocated in conjunction with a response-to-intervention (RTI) model. Adopting a neuropsychological approach has been proposed to provide a relevant perspective, which lends itself to intervention planning in a way that traditional models do not.

Learning Disabilities

Perhaps the first educational category proposed to benefit from advances in neuroscience and neuropsychological assessment was that of learning disabilities. As early as 1968, Gaddes proposed to “integrate neurological, psychological, and educational knowledge” in an attempt to both understand and recommend interventions for children with learning disabilities (p. 46). Rourke (1975; 1976) was also an early proponent of the relevance of neuropsychology for students with learning disabilities. He stated that in addition to providing information regarding the student’s brain, a neuropsychological evaluation should be able to delineate both abilities and deficits, the magnitude of such abilities and deficits, and guide intervention programming for the student (Rourke, 1976). More recent proponents continue to cite the way in which information from neuroscience can help guide interventions for students with learning disabilities while also addressing struggling students who may have learning difficulties which do not meet discrepancy criteria for special education eligibility (Moats, 2004).

School psychologists are seen as being in a key position to either deliver neuropsychological assessments or serve as a liaison to a clinical neuropsychologist working with a student with a learning disability or mental health issue (Cleary & Scott, 2011).

Response-to-intervention

Related to learning disabilities, many recent authors have advocated for the integration of a neuropsychological perspective or evaluation within an RTI framework (Cleary & Scott, 2011; Decker, 2008; Feifer, 2008; Hale et al., 2010; Hale et al., 2006; Schmitt & Wodrich, 2008; Semrud-Clikeman, 2005; Witsken et al., 2008). What appears to unify models proposed is dissatisfaction with discrepancy models used for specific learning disorder (SLD) diagnosis and a belief that neuropsychological principles can be integrated into an RTI model better serving students with learning impairments. Additionally, there is a belief that school psychologists, in particular, are uniquely positioned and have a relevant background to be trained in neuropsychological assessment practices and serve in a consultant role regarding neurodevelopment (Decker, 2008).

Advocates of a neuropsychological perspective cite neuropsychology's relevance towards nearly all eligibility categories relevant for special education qualification (Decker, 2008). When approaching learning disorders, neuropsychology has tended to focus more on "functional deficits" rather than intelligence-achievement discrepancies when conceptualizing learning disorders (Decker, 2008, p. 804). Proponents of

incorporating neuropsychological measures into an RTI framework cite shortcomings with using the discrepancy model for identification including reliability and validity issues, issues with under and over diagnosing learning disorders, indiscrimination between low-achieving students and those with SLD, and failure to identify the underlying cause of the learning disorder (Feifer, 2008; Hale et al., 2006; Schmitt & Wodrich, 2008; Semrud-Clikeman, 2005).

Models specifying how to incorporate neuropsychology into school psychology vary in the degree and level at which neuropsychology is incorporated into the traditional RTI model. For example, Semrud-Clikeman (2005) advocated screening children on “predictor variables” of a neuropsychological nature, such as working memory or executive function, in the initial tiers of the RTI model in order to both monitor progress and also identify children at “risk of not responding to the intervention at an earlier stage” (2005, p. 245). Witsken et al. (2008) also proposed neuropsychological screening at Tier I with additional neuropsychological measures at Tier II and a comprehensive evaluation at Tier III. Schmitt and Wodrich (2008) also support an evaluation at Tier III, which could include neuropsychological assessment; this is in line with an expert white paper consensus developed with the Learning Disabilities of America (LDA) which recommended RTI and comprehensive evaluation, which could include neuropsychological measures, to assess strengths and weaknesses for the evaluation of learning disorders (Hale et al., 2010).

Traumatic Brain Injury

Individuals suffering a traumatic brain injury (TBI), of course, would likely be the category most lay people would assume would benefit from neuropsychological evaluation. Modern technology has allowed many children and adolescents with acquired brain injury to survive and resume daily activities, including returning to school (Miller, 2010). Children recovering from moderate to severe brain injury are likely to qualify for special education services due to post-concussion syndrome, symptoms which include “headache, dizziness, vertigo, memory problems, trouble concentrating, sleeping problems, restlessness, irritability, apathy, depression, and anxiety,” all of which could affect cognition and school functioning (Miller, 2010, p. 795-796). Though children demonstrate brain plasticity with regards to recovery from TBI, a neurocognitive assessment could be beneficial in assessing deficits both when the child or adolescent returns to school and also when educational placement changes or individual education plan (IEP) goals are reassessed due to the possibility of cognitive deficits developing over time (Miller, 2010).

Psychopathology

Children who suffer from mental health issues in the schools have also been seen as benefiting from a neuropsychological perspective and services (Cleary & Scott, 2011; Davis, 2006). Due to evidence existing which describes a neurological basis to many common childhood mental health issues, Davis (2006) stated that a neuropsychological approach in the schools would be beneficial in addressing such diverse pathologies as

mood disorders, anxiety, attention deficit hyperactivity disorder (ADHD), conduct disorder, oppositional defiant disorder (ODD), emotional disturbance, and autism . In addition to aiding in diagnosis and intervention, Davis stated that neuropsychological assessment and awareness may help specify cognitive deficits these children are experiencing due to psychopathology in addition to helping school psychologists communicate with medical personnel involved in treatment planning.

Multicultural students

Another area in which a neuropsychological perspective has been supported for use in the schools is with multicultural students. Traditional methods of assessing are seen to be weak in comparison to neuropsychological approaches which specify a child's strengths and weaknesses and may better serve minority students (Peters, Fox, Weber, & Llorente, 2005). Assessment of specific domains, which can be linked to intervention efforts, is a proposed strength of a neuropsychological perspective (Peters et al., 2005). An additional strength of a neuropsychological perspective, when working with multicultural students, is a focus on assessment measures that assess fluid abilities, which are believed to be less culturally influenced than crystallized abilities (Peters et al., 2005).

Proposed Roles

In the event school psychologists were to incorporate a neuropsychological perspective or practice into their discipline, two potential roles have been proposed. The first involves a neuropsychology specialization within the field, and the second involves a

consultant role. Both of these roles offer solutions for an increased interest and demand for neuropsychological services within the schools.

Due to the breadth of knowledge required by school psychologists coupled with the demands of the practice and schools in which school psychologists work, Reynolds (2011) proposed specialty training for school psychologists. There are a number of areas in school psychology in which specialization could prove beneficial including that of neuropsychology. Reynolds states that working as a generalist, at both the nondoctoral and doctoral level, may reduce school psychologists to a “technical occupation” if the profession does not specialize. Citing precedent for specialization in other areas of psychology, Reynolds believes this to be the route to go for school psychology if practitioners are to practice competently and ethically in the field.

Another interesting role proposed by neuropsychologists, who have worked on teams with school psychologists, involves the school psychologist serving in either a liaison role or as a co-evaluator (Ernst, Pelletier, & Simpson, 2008). In the liaison role, the school psychologist would consult with the neuropsychologist while the neuropsychologist would conduct the evaluation. The school psychologist could provide helpful information regarding required documentation and what type of special services are available and appropriate. In the co-evaluator role, the school psychologist would conduct the parts of an evaluation typical to standard school-based evaluations while the neuropsychologist would perform additional neuropsychological assessments. Both of

these roles, as proposed by practicing neuropsychologists, would circumvent the need for additional training.

Training

Regarding training for school psychologists who are interested in gaining further knowledge regarding neuropsychology, there currently exist two primary options for increasing knowledge and skills in neuropsychology. According to Miller (2007), “specialization in school neuropsychology at the doctoral level is the preferred model of training” (p. 49). A few doctoral school psychology programs offer a specialization in school neuropsychology while another option would be to pursue neuropsychology training within a clinical psychology program following a Master’s or Specialist degree in school psychology. For those seeking a less time intensive option, there is an option for post-graduate certification in school neuropsychology for both nondoctoral and doctoral school psychologists. This program lasts ten months and teaches “professionals how to use current school neuropsychological assessment instruments and link assessment data to evidence-based interventions” (Miller, 2010, p. 25). Regardless of training method chosen, Hynd and Reynolds (2005), two former faculty members of school psychology doctoral programs, believe specialization to be imperative for the field of school psychology as a whole stating that they “cannot train our graduates to equal and effective levels of knowledge and skill in all areas demanded in practice” (p. 12). Hence, the need for further training and skill in specific areas appears paramount.

Survey Research

The primary way in which neuropsychological interest and practice has been assessed is through the use of survey questionnaires. Beginning in the early 1980's, research shows a pattern of exploration of the training practices of graduate school psychology programs (D'Amato et al., 1992; Hynd et al., 1980; McGrath & Yalof, 2007 (as cited in Miller, 2010); Walker et al., 1999). At times when practicing school psychologists have been surveyed to ascertain their interest in further neuropsychological training, interest has appeared high (Leavell & Lewandowski, 1988; McGrath & Yalof, 2008 (as cited in Miller, 2010); Slonaker, 2009). A review of relevant survey research into school psychologist training, interest, and practice follows.

Hynd et al. (1980) conducted the initial survey contacting school psychology programs to ascertain the extent to which training programs were preparing graduates for work in neuropsychological screening and assessment. Participants in the study included school psychology program directors or their representatives. Survey questions were designed to measure whether programs required academic coursework, and the extent to which students were exposed to neuropsychological screening and assessment techniques. Additionally, the researchers attempted to gauge perceived student interest in this area of study via program director report. Results were broken down by type of program: master's, certificate, or doctoral. Students in doctoral programs were most likely to be required to take neuropsychological coursework (86%), specifically physiological psychology, followed by master's programs (60%), and finally certificate

programs (33%). Similarly, the degree to which programs provided training in neuropsychological screening and assessment varied by program type, with doctoral programs offering the most training. A majority of directors reported both an interest in having their students receive training in neuropsychological assessment as well as student's themselves communicating an interest in the field of study. At the time of the study, the authors noted an interest and movement towards incorporating neuropsychological assessment and interpretation.

Leavell and Lewandowski (1988) surveyed school psychologists later in the decade to learn about their interest, knowledge, and experience working from a neuropsychological perspective. In addition to learning about school psychologists' beliefs and practices, the researchers sought to discover the extent to which school psychologists encountered children whom they believed suffered from conditions with a neurological origin. Participants were initially recruited for participation while at a national school psychology conference. In order to broaden the sample, the researchers also mailed surveys to a random sample of National Association of School Psychologists (NASP) members. The instrument used was a 21 item questionnaire developed by the researchers. It consisted of demographic questions and items related to the question of interest presented in various formats. Results indicated that over 43% of students served by the school psychologists in the past year showed symptoms demonstrating neurological involvement, and a majority of school psychologists felt that many of the conditions that they saw in the schools had a neurological origin. Despite over 50% of

respondents reporting never having taken a course in neuropsychology, 92% of the participants stated that they would like more training in neuropsychology. The authors suggested that coursework incorporating “brain-behavior relationships” be added to the core curriculum of training programs (Leavell & Lewandowski, 1988, p. 154).

Copeland and Miller (1985) surveyed members of NASP who were practicing school psychologists in an effort to assess training needs of school psychologists. The survey was designed by the researchers and based upon a similar survey which assessed graduate school programming in special education. Questions were designed to assess how useful respondents felt a given course of study would be based upon current and future training needs. Results indicated that respondents felt that neuropsychological assessment would be an important area of training need in the future. The authors commented upon an increased priority for course work in neuropsychological assessment.

D’Amato et al. (1992) surveyed American Psychological Association (APA) accredited and nonaccredited school psychology programs to determine neuropsychological training. Surveys were mailed to the program directors of all 72 doctoral school psychology training programs in the United States. The surveys included 13 questions presented in an open-ended format which addressed the practice of neuropsychology. Similar to studies previously mentioned, results suggested a high interest in neuropsychology; this was despite faculty training in the area appearing limited with none of the respondents reporting “primary training in neuropsychology as a

major area of study” (D’Amato et al., 1992, p. 180). The results also illustrated a discrepancy between professor and student opinions regarding neuropsychology. While most programs stated that students showed a high degree of interest, there were negative comments noted by professors regarding the relevancy of neuropsychology to the school psychology discipline. The authors suggested further training both for programs and faculty members of said programs.

Research has also been conducted regarding school psychology training specifically related to neuropsychology and brain injury (Walker et al., 1999). Citing the prime position of school psychologists to both assess students with brain injury and also formulate intervention plans for this population, Walker et al. sought to discern school psychology training practices regarding brain injury and neuropsychology. A survey was designed and distributed to all NASP school psychology training programs. Of the programs which responded to the study, 27% reported having faculty with neuropsychological expertise; doctoral programs were the most likely to have access to such expertise. However, many of the faculty members with said expertise had experience with adults rather than children. Regarding course content, a mere 23% of programs required a course in neuropsychology. Of those programs which did not offer neuropsychological course content, most stated that they did not plan to offer training in the future. The authors made note of the limited amount of neuropsychology and brain injury training within school psychology graduate programs couple with limited faculty expertise.

McGrath and Yalof (as cited in Miller, 2010) conducted a series of surveys regarding neuropsychological preparation which they presented as posters at the National Association of School Psychologists in 2007 and 2008. The initial survey asked school psychology training programs about course work required with neuropsychological principles, and results indicated a mean of less than one course. The follow-up survey asked school psychologists about training in neuropsychology, and results indicated a median of one course taken regarding school neuropsychology though 85% reported an interest in more training in this area. Similarly, 84% of respondents believed neuropsychologically informed assessment methods to be essential.

Most recently, Slonaker (2009) developed an original questionnaire and surveyed members of NASP practicing in public schools regarding views, practices, and training with neuropsychological measures. With regards to commonly administered assessment instruments, neuropsychological measures were found to be used less frequently than cognitive, achievement, visual-motor, and rating scale measures. A majority of school psychologists surveyed believed neuropsychological assessment to be important but lacked training, confidence, and expertise. Similar to previously cited studies, a majority, 82%, expressed desire in receiving more training in this area.

With this in mind, the proposed study aims to explore neuropsychological training, usage, and interest among school psychologists in the state of Washington as well as interactions with neuropsychologists which school psychologists may have experienced.

Specifically, the research questions for this study include:

1. What types of training in neuropsychology have school psychologists experienced, both at the graduate school level and in the field?
2. What is the attitude towards the incorporation of a neuropsychological perspective and neuropsychological assessment?
3. What does professional practice look like with regard to the incorporation of a neuropsychological perspective and neuropsychological assessment?
4. Have school psychologists interacted with neuropsychologists either through referral or consultation?
5. What barriers do school psychologists foresee to the adoption of such a perspective?

CHAPTER III

METHOD

A survey questionnaire was developed by the researcher in consultation with academic peers and faculty advisors. The survey was created to examine interest regarding the integration of a neuropsychological perspective into school psychology practice among practicing school psychologists in Washington State. Additionally, the questionnaire examined graduate school training experiences with regard to neuropsychological course content, interactions with neuropsychologists through consultation and referral, attitudes and practices with regards to the incorporation of a neuropsychological perspective, and potential barriers school psychologists may foresee to the adoption of such a perspective.

Participants

Participants in the study consisted of 433 school psychologists in the state of Washington. Participants were identified through a list provided by the Office of Superintendent of Public Instruction (OSPI). The list received from OSPI contained names, school districts, and years of experience of individuals reported to have been serving in the role of school psychologist in October of 2012 by their employing school districts. This list was used by the researcher to identify the e-mail addresses of listed individuals. The original list contained 1144 individuals' names; however, there were instances of individuals being misreported as serving in the school psychologist role by their employing district, instances where an accurate e-mail address was unable to be

obtained, and instances where individuals had opted out from receiving e-mails from Survey Monkey©, the survey development company used in the research study. Taking the aforementioned difficulties into consideration, the first distribution of the survey was mailed to 1111 e-mail address. However, 10 individuals either opted out or reported to the researcher that they were not school psychologists after the initial mailing, and an additional 69 e-mail addresses bounced for a remaining initial distribution to 1032 valid e-mail addresses. There were 433 respondents to the survey for an approximate response rate of 42%.

Instrument

The survey developed by the researcher was comprised of 25 questions addressing six broad topic areas including: (a) demographic information (b) neuropsychology training experiences of school psychologists (c) attitudes and beliefs regarding the incorporation of neuropsychology into school psychology practice (d) professional practices related to the incorporation of neuropsychology into school psychology practice (e) referral and consultation with clinical neuropsychologists and, (f) potential barriers to the adoption of a neuropsychological perspective by school psychologists. (See Appendix A for a copy of the survey.) The survey was converted to electronic format with the use of Survey Monkey© in order for the survey to be sent electronically through e-mail to participants.

To determine the functionality of Survey Monkey© as well as the appropriateness and sequencing of individual items included on the survey, an initial test run of the survey was conducted, which included four participants. Participants in this portion of the study included school psychologists known to the researcher as well as academic peers pursuing graduate level psychology degrees. After completion of this phase of the study, minor grammatical and item phrasing changes were made. Results from this phase of the study were not included in the final study results and analysis.

Procedure

The questionnaire developed by the researcher was sent out electronically through e-mail to school psychologists in Washington State, as identified through the list provided by OSPI. The initial e-mail sent out to participants included an introduction, short description of the research, and a link to the survey; this e-mail was sent the last week in May of 2013. A second e-mail was sent out one week following the initial e-mail, and a third and final e-mail was sent out a week following the second e-mail. The second and third e-mails to participants were designed to increase response rate. Procedures for the study were approved by Central Washington University's Human Subject Review Committee (HSRC) prior to the initiation of the study.

Methodology

This study primarily used a descriptive survey approach. A survey design was chosen based upon previous research examining neuropsychological interest and training with regard to school psychology practice and the desire of the researcher to replicate,

expand upon, and explore past findings as described in the literature. Similar to previous surveys examining this topic, data were primarily analyzed using descriptive analysis. In a few instances, statistical significance tests were employed to determine relationships among obtained data in relation to categorical data such as type of degree earned and size of school district in which participants were employed.

CHAPTER IV

RESULTS

The results from this study were compiled from the responses of 433 participating school psychologists. Participants in the study were instructed that they were free to answer as many or as few questions as they desired. Following are the results of the survey broken down by each of the six broad topic areas. (See Appendix A for full results of the survey.)

Demographic Information

The survey began by asking a number of demographic questions including: the type of school psychology degree earned, when and where participants had completed training, how long participants had been practicing as a school psychologist, whether participants had completed a graduate degree in an area other than school psychology, and how participants would classify the school district in which they were currently employed. With regard to the highest school psychology degree participants had obtained, a Master's degree was reported most often ($n = 214, 49.88\%$) followed by participants with a Specialist degree ($n = 180, 41.96\%$), and finally those with a Doctorate degree ($n = 35, 8.16\%$). A majority of participants reported completing their school psychology training in Washington State ($n = 261, 60.98\%$) as opposed to out of state ($n = 167, 39.02\%$).

Participants were also asked to specify the year in which they had completed their school psychology training. Results were broken down by decade with the fewest participants reporting having completed their training in the 1960s ($n = 1, 0.24\%$) and the

most having completed their training in the 2000s ($n = 168$, 40.10%). With the exception of the number of participants reported in the last, incomplete, decade (2010s), there was an increasing number of participants reporting having completed their training each subsequent decade (1970s: $n = 21$, 5.01%; 1980s: $n = 57$, 13.60%; 1990s: $n = 99$, 23.62%; 2010s: $n = 71$, 16.95%). Relatedly, when asked how long they had been practicing as a school psychologist, the greatest number of respondents reported practicing 0-5 years ($n = 107$, 25.54%) with gradual declines in number of respondents each 5 year increment of increasing number of reported years having practiced in the role (6-10 years: $n = 101$, 24.11%; 11-15 years: $n = 68$, 16.23%; 16-20 years: $n = 60$, 14.32%; 21-25 years: $n = 38$, 9.07%; 26-30 years: $n = 24$, 5.73%, 31-35 years: $n = 14$, 3.34%; 36+ years: $n = 6$, 1.43%).

Participants were also asked if they had a graduate degree in an area other than school psychology. The majority of participants reported that they did not possess a graduate degree in another field ($n = 254$, 59.35%) while 174 respondents (40.65%) reported that they possessed a graduate degree in a field other than school psychology. For those who reported that they had completed a graduate degree in another field, an open-ended question was asked as to the field of the additional degree and degree type. The majority of respondents reported only the academic field of study, and results from those responses were categorized; in some instances, respondents reported multiple graduate degrees earned in fields other than school psychology. Of those who possessed graduate degrees in other academic areas, the most commonly reported fields in which

participants held degrees were Counseling ($n = 70, 40.32\%$) and Education ($n = 34, 19.54\%$), though many academic areas were mentioned (Clinical: $n = 26, 14.94\%$; Administration: $n = 11, 6.32\%$; Educational Psychology: $n = 10, 5.75\%$, Other Psychology: $n = 8, 4.60\%$; MSW: $n = 7, 4.02\%$; MFT: $n = 4, 2.30\%$; Developmental Psychology: $n = 3, 1.72\%$; Experimental Psychology: $n = 3, 1.72\%$; Other: $n = 13, 7.47\%$; N/A: $n = 5, 2.87\%$).

Concerning the size of the district in which they were employed, the majority of respondents reported working in a district they categorized as suburban ($n = 224, 52.09\%$). There were similar, though fewer, numbers of respondents reporting working in Urban and Rural districts. Rurally employed school psychologists ($n = 108, 25.12\%$) slightly outnumbered those who characterized the districts in which they were employed as Urban ($n = 98, 22.79\%$).

Training

The second topic area addressed by the study focused on training experiences of school psychologists with regard to neuropsychology. The questionnaire first dealt with training experiences at the graduate school level. To begin with, participants were asked both whether they had been required to complete a course in physiological psychology or brain/behavior relationships and also whether a course with a main emphasis on neuropsychology was required. Nearly equal numbers of participants reported that they had been required to complete a course in physiological psychology or a course emphasizing brain/behavior relationships ($n = 208, 50.24\%$) as those who were not

required to complete such a course ($n = 206, 49.76\%$). Participants who responded that they had been required to take such a course were asked to specify the name of the course if they recalled. The two most reported courses by participants were courses with 'neuropsychology' in the title ($n = 67, 32.21\%$) followed by physiological psychology ($n = 41, 19.71\%$). When explicitly queried whether a course with a main emphasis on neuropsychology was required in their graduate degree programs, 159 respondents (38.13%) reported that such a course was required while a majority of respondents ($n = 258, 61.87\%$) reported that a neuropsychology course was not required. For those who responded that a course with an emphasis on neuropsychology was required, they were once again asked to attempt to recall the name of the course. Similar to the results of the previous question, the two most commonly recalled course names were courses with 'neuropsychology' in the title ($n = 104, 65.41\%$) and physiological psychology ($n = 7, 4.40\%$). In an attempt to discern whether neuropsychology courses were offered but perhaps not required, participants were also asked whether a course with a main emphasis on neuropsychology was offered. A majority of respondents reported that such a course was not offered ($n = 232, 55.90\%$) as compared to those who reported that such a course was offered ($n = 183, 44.10\%$).

Concerning whether school psychologists were trained to administer neuropsychological assessment instruments in their graduate degree programs, a majority of respondents reported that they had not received training ($n = 263, 63.53\%$) while 151 respondents (36.47%) reported receiving training in neuropsychological assessment

measures. While in practicum or internship, a majority of respondents ($n = 274, 66.02\%$) reported not being exposed to training related to neuropsychology as opposed to those who did report such experiences ($n = 141, 33.98\%$). When asked to rate their level of agreement with the following statement: More training in neuropsychological principles at the graduate school level would be helpful for future school psychologists, a majority of respondents reported that they agreed ($n = 195, 46.76\%$) or strongly agreed ($n = 156, 37.41\%$) with the statement.

With regard to training in neuropsychology following graduate school, a majority of respondents ($n = 310, 74.52\%$) reported having taken workshops, continuing education courses, or in-service trainings related to neuropsychology. Respondents who had participated in such trainings were subsequently asked to estimate the number of trainings in which they had taken part. The greatest number of participants reported having taken part in 1-3 trainings ($n = 145, 46.77\%$) followed by a group estimating 4-6 trainings ($n = 90, 29.03\%$); however, there was a somewhat sizable group of individuals who had taken part in an estimated 10+ trainings ($n = 25, 8.06\%$).

During the school year in which the survey was conducted, the Washington State Association of School Psychologists (WSASP) conducted a lecture series titled 'Introduction to School Neuropsychology'. Participants were queried as to whether they had participated in the lecture series, with very few respondents reporting that they had participated ($n = 22, 5.29\%$). Relatedly, participants were asked whether they were enrolled in or had completed the post-graduate school neuropsychology certification

program offered through KIDS, Inc. (<http://www.schoolneuropsych.com>) and Dr. Dan Miller. Eleven participants (2.64%) reported participation in the school neuropsychology program. With regard to receiving more training in neuropsychology and neuropsychological assessment methods, a majority of respondents reported that they were interested in receiving more training ($n = 358$, 86.47%).

Attitudes and Beliefs Regarding Neuropsychology

Next, participants were asked questions related to their attitudes and beliefs with regard to neuropsychology. A majority of respondents reported agreeing ($n = 210$, 50.60%) or strongly agreeing ($n = 146$, 35.18%) that the incorporation of a neuropsychological perspective is relevant to the practice of school psychology. Relatedly, a majority of respondents also reported agreeing ($n = 202$, 48.56%) or strongly agreeing ($n = 181$, 43.51%) that there is neurological involvement in the conditions encountered by school psychologists when working with children with disabilities who are eligible for special education services.

Professional Practices Related to Neuropsychology

In the next section of the survey, participants were queried as to their professional practices related to neuropsychology. Participants were first asked to specify the extent to which they used neuropsychological principles when conducting assessments. The response garnering the highest number of responses was “Occasionally” ($n = 167$, 40.83%) followed by similar numbers of respondents who answered “Frequently” ($n = 101$, 24.69%) and “Rarely” ($n = 97$, 23.72%). There were also fewer though similar

numbers of respondents who reported that they “Never” ($n = 23, 5.62\%$) or “Very Frequently” ($n = 21, 5.13\%$) used neuropsychological principles when conducting assessments. School psychologists who had obtained a doctorate degree ($M = 4.17, SD = 1.69$) were significantly more likely to report using neuropsychological principles more often when conducting assessments than school psychologists with a Master’s/Specialist degree ($M = 3.67, SD = 1.38$), $t(427) = 2.03, p = .04, d = .36$.

A related question asked participants to specify how often they used neuropsychological assessment instruments or batteries when conducting assessments. The response option chosen by the most respondents was “Rarely” ($n = 154, 37.56\%$) followed by “Occasionally” ($n = 95, 23.17\%$) and “Never” ($n = 84, 20.49\%$). Fewer numbers of participants chose the response options “Frequently” ($n = 62, 15.12\%$) or “Very Frequently” ($n = 15, 3.66\%$). In this instance, there was not a significant difference reported in the rates of actual use of neuropsychological assessment instruments by school psychologists with a Doctorate degree ($M = 4.17, SD = 1.40$) as compared to school psychologists with a Master’s/Specialist degree ($M = 3.82, SD = 1.35$), $t(427) = 1.49, p = .14$.

The last question in this section asked participants to rate how often they used a number of cognitive and neuropsychological tests in their practice as a school psychologist. Tests chosen for inclusion were based upon a list of major school neuropsychological tests published since 1990 as cited in Miller (2010). Response options for each of the sixteen assessment instruments were “Never”, “Rarely”,

“Occasionally”, “Frequently”, or “Very Frequently”. For 15 of the 16 assessment instruments, the response option garnering the highest number of responses was “Never”. The exception to this pattern was the Wechsler Intelligence Scale for Children – Fourth Edition (WISC–IV) where “Very Frequently” ($n=183$, 45.19%) was the response option chosen by the most participants. For full results across all 16 instruments please see Table 1. Table 2 ranks the cognitive and neuropsychological measures by reported rates of use using the mean rating of each measure.

Referral and Consultation

The survey also included questions regarding rates of referral and consultation with clinical neuropsychologists by school psychologists. To begin, participants were asked if they had ever referred a student for a clinical neuropsychological evaluation. Results were nearly equally split with 206 respondents (50.24%) replying that they had made a referral, and 204 respondents (49.76%) replying that they had not referred a student for a neuropsychological evaluation. There was not a significant relationship between reported district size (urban, suburban, rural) and whether school psychologists reported referring a student for a neuropsychological evaluation, $X^2(2, N = 410) = 5.01$, $p = .08$. For those participants who reported making a neuropsychological referral, they were asked to choose the category of disability that best fit the student(s) who they had referred. Participants were free to choose more than one disability category. From the 13 educational disability categories, the three categories with the highest number of reported referrals were Other Health Impairment ($n = 120$, 58.25%), Autism ($n = 104$, 50.49%),

Table 1

Cognitive Ability and Neuropsychological Assessment Rates of Use

<u>Assessment Instrument</u>	<u>Response Options</u>				
	Never	Rarely	Occasionally	Frequently	Very Frequently
CAS	(266) 70%	(54) 14%	(21) 6%	(12) 3%	(27) 7%
WJ-III Cog.	(143) 36%	(103) 26%	(76) 19%	(33) 8%	(40) 10%
WPPSI-III	(199) 52%	(88) 23%	(67) 17%	(19) 5%	(13) 3%
SB5	(159) 41%	(115) 30%	(76) 20%	(23) 6%	(13) 3%
WISC-IV	(17) 4%	(28) 7%	(70) 17%	(107) 26%	(183) 45%
KABC-II	(192) 51%	(65) 17%	(49) 13%	(29) 8%	(45) 12%
DAS-II	(123) 31%	(80) 20%	(72) 18%	(41) 10%	(77) 20%
TOMAL	(320) 85%	(41) 11%	(12) 3%	(2) 1%	(1) 0%
CVLT: C	(354) 94%	(16) 4%	(4) 1%	(2) 1%	(0) 0%
CMS	(334) 88%	(27) 7%	(16) 4%	(1) 0%	(2) 1%
WMS-III	(334) 88%	(34) 9%	(11) 3%	(1) 0%	(0) 0%
NEPSY/NEPSY II	(285) 75%	(65) 17%	(19) 5%	(8) 2%	(3) 1%
TEA	(359) 95%	(12) 3%	(5) 1%	(1) 0%	(0) 0%
D-KEFS	(345) 91%	(22) 6%	(8) 2%	(4) 1%	(0) 0%
DW	(354) 96%	(11) 3%	(4) 1%	(1) 0%	(0) 0%
WRAML	(254) 67%	(58) 15%	(50) 13%	(12) 3%	(5) 1%

Note. CAS = Cognitive Assessment System; WJ-III Cog. = Woodcock-Johnson III Tests of Cognitive Abilities; WPPSI-III = Wechsler Preschool and Primary Scales of Intelligence-Third Edition; SB5 = Stanford-Binet Intelligence Scales: Fifth Edition; WISC-IV = Wechsler Intelligence Scale for Children-Fourth Edition; KABC-II = Kaufman Assessment Battery for Children-Second Edition; DAS-II = Differential Ability Scales-Second Edition; TOMAL = Test of Memory and Learning; CVLT: C = California Verbal Learning Test: Children's Version; CMS = Children's Memory Scale; WMS-III = Wechsler Memory Scale-Third Edition; TEA = Test of Everyday Attention; D-KEFS = Delis-Kaplan Executive Functions System; DW = Dean-Woodcock Neuropsychological Battery; WRAML = Wide Range Assessment of Memory and Learning.

Table 2

Cognitive Ability and Neuropsychological Assessments Ranked by Rates of Use: Most Frequent to Least Frequent by Mean Rating of Participant

Assessment Instrument	Mean Rating
WISC-IV	4.01
DAS-II	2.67
WJ-III Cog.	2.30
KABC-II	2.13
SB5	2.01
WPPSI-III	1.86
CAS	1.63
WRAML	1.56
NEPSY/NEPSY II	1.37
TOMAL	1.20
CMS	1.18
WMS-III	1.16
D-KEFS	1.13
TEA	1.07
DW	1.06
CVLT: C	1.03

Note. CAS = Cognitive Assessment System; WJ-III Cog. = Woodcock-Johnson III Tests of Cognitive Abilities; WPPSI-III = Wechsler Preschool and Primary Scales of Intelligence-Third Edition; SB5 = Stanford-Binet Intelligence Scales: Fifth Edition; WISC-IV = Wechsler Intelligence Scale for Children-Fourth Edition; KABC-II = Kaufman Assessment Battery for Children-Second Edition; DAS-II = Differential Ability Scales-Second Edition; TOMAL = Test of Memory and Learning; CVLT: C = California Verbal Learning Test: Children's Version; CMS = Children's Memory Scale; WMS-III = Wechsler Memory Scale-Third Edition; TEA = Test of Everyday Attention; D-KEFS = Delis-Kaplan Executive Functions System; DW = Dean-Woodcock Neuropsychological Battery; WRAML = Wide Range Assessment of Memory and Learning.

and Traumatic Brain Injury ($n = 76, 36.89\%$). For additional results concerning referrals made by category, please see Table 3.

Next, participants were asked whether they had ever received a neuropsychological report regarding a student, and if so, how helpful they found the report to be. A majority of respondents ($n = 377, 91.95\%$) reported receiving a neuropsychological report regarding a student. Of those who had received such a report in their professional work, a majority found the report to be “Moderately helpful” ($n = 197, 52.39\%$). Response options for this question ranged from “Very unhelpful” to “Very helpful”, and the next most chosen response was “Very helpful” ($n = 62, 16.49\%$) followed by “Moderately unhelpful,” “Neither helpful or unhelpful” and “Very unhelpful” respectively.

Finally, participants were queried as to whether they had ever consulted with a clinical neuropsychologist regarding a student. A majority of respondents reported that they had consulted with a clinical neuropsychologist ($n = 215, 52.44\%$) with slightly fewer numbers of respondents reporting that they had not consulted with a clinical neuropsychologist ($n = 195, 47.56\%$). Similar to results regarding referral, there was not a significant relationship between reported district size (urban, suburban, rural) and whether participants reported consulting with a clinical neuropsychologist regarding a student, $X^2(2, N = 410) = 4.25, p = .12$.

Table 3

Disability Categories Referred for Neuropsychological Evaluation by School Psychologists who Reported Referring a Student for a Clinical Neuropsychological Evaluation

Educational Disability Category	(n)	%
Other Health Impairment	(120)	58
Autism	(104)	50
Traumatic Brain Injury	(76)	37
Specific Learning Disability	(73)	35
Emotional Behavioral Disability	(69)	34
Developmental Delay	(41)	20
Intellectual Disability	(41)	20
Multiple Disabilities	(33)	16
Speech or Language Impairment	(19)	9
Visual Impairment	(7)	3
Hearing Impairment	(3)	1
Orthopedic Impairment	(2)	1
Deaf-Blindness	(1)	0

Potential Barriers

To conclude the survey, participants were asked about potential barriers to the adoption of a neuropsychological perspective by school psychologists. A majority of school psychologists ($n = 253$, 62.01%) responded that they believed there were potential barriers to the adoption of such a perspective while fewer numbers of respondents did not

foresee potential barriers ($n = 155, 37.99\%$). Those who believed barriers existed were queried as to reasons they believed the adoption of a neuropsychological perspective might face challenges. A number of potential barriers were listed as options to choose from along with an “Other” category which included space for participants to provide a written response; participants were free to endorse multiple categories. From the six listed potential barriers, the most commonly endorsed barriers included: “Lack of training in neuropsychology at the graduate school level” ($n = 186, 73.23\%$), “Lack of time to adequately devote to neuropsychology during school psychology training” ($n = 151, 59.45\%$), and “Lack of practicality of neuropsychology to the field of school psychology” ($n = 111, 43.70\%$). “Lack of graduate school faculty with neuropsychological expertise” ($n = 69, 27.17\%$), “Lack of interest in neuropsychology by school psychologists” ($n = 40, 15.75\%$), and “Lack of relevancy of neuropsychology to the field of school psychology” ($n = 38, 14.96\%$) were endorsed by participants at lower rates. The “Other” category was chosen by 120 participants (47.24%). Written responses to the “Other” response option were categorized according to item content into 11 categories. The three categories garnering the highest number of written in responses as potential barriers were: Lack of resources ($n = 35$), Lack of time on the job to incorporate a neuropsychological perspective ($n = 35$), and Administrator/Teacher buy in ($n = 17$). A number of additional concerns were written in which could be categorized; results can be seen in Table 4.

Table 4

Write-in Responses: Potential Barriers in the Adoption of a Neuropsychological Perspective by School Psychologists

Write-in Response	(n)	%
Lack of Resources (\$, test kits)	(35)	29
Lack of Time (on the job)	(35)	29
Administrator/Teacher Buy In	(17)	14
Fit with Current Qualification Model	(11)	9
Scope of Practice Concerns	(8)	7
Training for Practitioners in the Field	(8)	7
No Additional Practical Benefit	(7)	6
State/Federal Regulation Concerns	(6)	5
RTI Focus in the Schools	(5)	4
Concerns with NP as a Field	(4)	3
Other	(12)	10

CHAPTER V

DISCUSSION

The purpose of this study was to examine interest regarding the integration of a neuropsychological perspective into school psychology practice among practicing school psychologists in Washington State. There were six broad topic areas the survey addressed and five specific research questions the study sought to answer. The topic areas of the survey and research questions of the study were identical with the addition of an initial demographic information section added to the survey. The specific research questions the study sought to answer were: (1) What types of training in neuropsychology have school psychologists experienced, both at the graduate school level and in the field? (2) What is the attitude towards the incorporation of a neuropsychological perspective and neuropsychological assessment? (3) What does professional practice look like with regard to the incorporation of a neuropsychological perspective and neuropsychological assessment? (4) Have school psychologists interacted with neuropsychologists either through referral or consultation? and, (5) What barriers do school psychologists foresee to the adoption of such a perspective?

Demographic Information

The majority of participants in this study held a Master's or Specialist degree. This is similar to demographic data reported in a national survey of school psychologists examining neuropsychological interest (Leavell & Lewandowski, 1988). Leavell and Lewandowski's study, however, had more respondents reporting a doctorate degree than did the current study, 26% as compared to 8%. Curtis et al. (2008) estimated that

approximately 24% of practicing school psychologists possess a doctorate degree, which suggests that practitioners with a doctorate may be underrepresented in the current study. However, a recent survey of Washington State school psychologists reported similar demographic characteristics with regard to degree type, with approximately 10% of respondents reporting a doctorate degree (Lund, 2011).

The majority of participants in the study completed their school psychology training in Washington State suggesting that training experiences reported by those individuals are indicative of school psychology training practices of institutions in Washington State. With regard to when participants had completed their training and how long they had been practicing, respondents were most likely to have completed their training recently and have been practicing a relatively shorter period of time, with the two largest groups reporting having practiced for 0-5 years and 6-10 years respectively. This is similar to Leavell and Lewandowski's (1988) study where the average respondent had 8 years of experience, Copeland and Miller's (1985) study where the majority of respondents had 4-8 years of experience, and Lund's (2011) survey of Washington State school psychologists where the largest two groups of respondents had 1-5 or 6-10 years of experience.

Concerning whether respondents held a graduate degree in another field, the majority of school psychologists did not. However, for those who did possess another graduate degree, degrees reported were typically in fields closely related to school psychology, where neuropsychological training may not have been covered during

coursework. For example, the two most commonly reported fields in which participants held degrees were counseling and education.

With regard to the size of district in which school psychologists were employed, the majority of respondents reported working in districts they characterized as suburban. This is similar to the results of Leavell and Lewandowski's (1988) study where the majority of school psychologists reported working in suburban districts. Demographic data reported in this study appeared similar to demographic data in previous studies examining this topic; however, the number of studies directly questioning school psychologists on this topic is small and demographic data that was directly comparable was not always available.

Training

Specific training in neuropsychology and the administration of neuropsychological assessment instruments at the graduate school level is far from common place as indicated by school psychologists who participated in the survey. At the graduate school level, 50% of respondents reported being required to complete a course in physiological psychology or brain/behavior relationships, while fewer respondents (38%) were required to complete a course with a main emphasis on neuropsychology. A slightly higher percentage of respondents (44%) reported that a course with a main emphasis on neuropsychology was offered, though not necessarily required, in their graduate degree program. With regard to training in the administration of neuropsychological assessment instruments, most school psychologists (66%) reported

not receiving such training during graduate school. This data suggests that training in neuropsychology at the graduate school level is not the experience of the majority of practicing school psychologists in Washington State.

With regards to graduate level training in neuropsychology, the results of this survey are similar to previously reported findings. With the first survey examining this topic, Hynd et al. (1980) reported that 38% of Master's level and 41% of Doctoral level students were required to complete a course in physiological psychology. At that time, school psychology program directors reported that 8% of Master's level and 24% of Doctoral level students were trained in neuropsychological assessment methods. The results of the current study reveal a modest increase both in the percentage of respondents indicating that a course in physiological psychology was required in their graduate program and also those indicating they had received training in neuropsychological assessment methods. Leavell and Lewandowski (1988) surveyed school psychologists and reported that 1/3 of respondents indicated that a course in neuropsychology was offered during their graduate training, which is similar to the 44% reported in the current study twenty-five years later. McGrath and Yalof (2008; as cited in Miller, 2010) reported comparable results when school psychologists were surveyed and reported a median of one required course where school neuropsychology was the main focus. When surveyed, school psychologists and program directors have not reported that specific training in neuropsychology is a common place practice or experience.

Despite the fact that graduate school training in neuropsychology was not reported as being a common experience in the current study, interest in neuropsychology among respondents appeared high as indicated by the numbers of individuals who reported seeking out training in the area once practicing in the field. Approximately 75% of individuals reported having participated in workshops, continuing education courses, or in-service trainings related to neuropsychology. Leavell and Lewandowki (1988) reported a similar percentage (77%) of school psychologists who reported having taken a workshop in neuropsychology. Over the years, it appears that one way in which individuals have had exposure to neuropsychology is through post-graduate training experiences rather than specific required graduate school experiences.

Although a clear majority of respondents indicated exposure to training in neuropsychology following graduate school, few reported participating in the specific neuropsychology training experiences about which the survey asked. Both the numbers of respondents participating in the spring lecture series, 'Introduction to School Neuropsychology' sponsored by WSASP and the postgraduate school neuropsychology certification program offered through KIDS, Inc. and Dr. Dan Miller were quite low, 5% and 3% respectively. These low numbers may be reflective of the longer time commitment required by both of these trainings. The WSASP training took place over the course of a number of weekends throughout the school year while the postgraduate certification program lasts approximately ten months.

Concerning their interest in more training in neuropsychology, a majority of respondents to the current survey indicated that they were both in favor of more training in neuropsychological principles at the graduate school level (84 % agreed or strongly agreed) and interested in receiving more training in neuropsychology and neuropsychological assessment methods themselves (87%). This is strongly in line with previous findings reported over the years when school psychologists have been queried regarding their interest in neuropsychology and receiving more training in the area. Leavell and Lewandowski (1988), McGrath and Yalof (2008), and Slonaker (2009) all reported high percentages of school psychologist interest in receiving more training in neuropsychology.

Attitudes and Beliefs Regarding Neuropsychology

Survey questions probing the relevance of neuropsychology to school psychology practice and whether there is neurological involvement in conditions encountered when practicing school psychology suggest that school psychologists generally believe neuropsychology to be relevant to their field of practice. A majority of school psychologists (86%) reported agreeing or strongly agreeing that the incorporation of a neuropsychological perspective is relevant to the practice of school psychology. Additionally, 92% of school psychologists reported agreeing or strongly agreeing that there is neurological involvement in the conditions encountered when working with children with disabilities who are eligible for special education services. In Leavell and Lewandowski's (1988) study, school psychologists reported seeing approximately 44%

of students in the past year who exhibited neurological signs. Whether participants in the current study would report caseloads where neurological signs are evident remains speculative; however, there appears to be an increased recognition that there is neurological involvement involved in the educational disabilities with which students present. It would appear from the current survey results that school psychologists believe neuropsychology as a discipline is relevant to the field they practice.

Professional Practices Related to Neuropsychology

With regard to professional practice, survey results indicated a difference between the extent to which school psychologists believed they use neuropsychological principles when conducting assessments and the actual rates of usage of neuropsychological assessment instruments or batteries when conducting assessments. Respondents were more likely to report using neuropsychological principles than neuropsychological assessment instruments or batteries when conducting assessments. Individuals with a Doctorate were also significantly more likely to report using neuropsychological principles than those with a Master's/Specialist.

Leavell and Lewandowski's (1988) survey asked participants how often they used neuropsychological principles in a number of professional capacities and found a majority who stated they used neuropsychological principles sometimes or always in those capacities. Those responses are similar to the majority of respondents who reported that they used neuropsychological principles occasionally or frequently in the current study. In summary, respondents tended to believe they were using neuropsychological

principles more often than they were using actual neuropsychological assessment instruments, and school psychologists with a Doctorate reported using neuropsychological principles in their assessments to a greater degree than school psychologists with a Master's/Specialist degree.

Concerning actual neuropsychological assessment use, a majority of survey respondents (58%) indicated that they rarely or never used neuropsychological assessments or batteries in their practice. When looking at actual reported rates of usage of individual neuropsychological assessment instruments, this fact was further illustrated by 15 of 16 listed instruments having a majority of respondents selecting that they never or rarely used the instrument when conducting assessments. The one instrument which defied this pattern was the WISC – IV, an instrument more typically thought of as a cognitive measure, despite the fact that neuropsychological constructs are integrated into the assessment. Slonaker (2009) reported similar findings in that neuropsychological measures were reportedly used much less frequently than more typical assessment measures such as measures of cognitive ability and achievement. In practice, it does not appear that neuropsychological assessment instruments are part of a typical school psychologist's assessment repertoire.

Referral and Consultation

Responses were split fairly evenly with similar numbers of respondents reporting that they either had or had not interacted with neuropsychologists through referral or consultation. With regard to referral, results were nearly equally split with 50.2% of

respondents reporting having made a referral and 49.8% of respondents reporting not having made a referral for a neuropsychological evaluation. Slightly greater numbers of respondents reported interacting with a neuropsychologist through consultation, 52%, as compared to 48% who had not consulted with a neuropsychologist. Interestingly, the three educational disability categories respondents reported referring the most often for a neuropsychological evaluation were Other Health Impairment, Autism, and Traumatic Brain Injury.

Despite slightly less than half of respondents reporting not having made a referral for a neuropsychological evaluation or consulting with a clinical neuropsychologist, a large majority of respondents (92%) had received a neuropsychological report regarding a student. Additionally, a majority of the respondents (69%) who had received such a report found it to be moderately helpful or very helpful. While direct interaction, in the form of referral or consultation, appears fairly evenly split among practicing Washington State school psychologists, a large number of individuals reported interaction with neuropsychologists through receiving neuropsychological evaluation reports, which they found to be at least moderately helpful. This information directly contributes to the literature in this area. Previously, Ernst et al. (2008) noted the lack of known studies examining school psychologist/ clinical neuropsychologist interaction and school psychologist perceptions of neuropsychological evaluation usefulness.

Potential Barriers

By and large, school psychologists responding to the survey do foresee barriers to the adoption of a neuropsychological perspective. When asked directly, a majority (62%) responded that they believed there were potential barriers to the adoption of a neuropsychological perspective. With regard to training, lack of training at the graduate school level and lack of time to adequately devote to such training were endorsed by a majority of respondents who believed there were potential barriers. Among the write-in responses, which were more focused on post graduate school training considerations, lack of resources, both monetary and with regard to test kit considerations, was mentioned. Additionally, lack of time on the job to devote to neuropsychological assessments and administrator/teacher buy-in to a neuropsychological perspective were mentioned by a number of individuals. Others were concerned with how a neuropsychological perspective would fit into the current state qualification model or whether there would be scope of practice concerns.

None of the concerns noted are particularly new to the conversation of how school psychology and neuropsychology might interface. Respondents to Leavell and Lewandowski's (1988) study twenty-five years ago mentioned similar concerns including the need for: more training, support from supervisors, and supervision as well as wondering whether neuropsychology could be integrated ethically given current training in the area. Despite the passage of time, school psychologists continue to foresee

potential barriers to the adoption of a neuropsychological perspective and practices in their work.

Conclusion

The results of this study shed light into the current interest of Washington State school psychologists into the incorporation of a neuropsychological perspective into professional practice. This is the first known inquiry into this research area at the state rather than national level and provides a picture of the attitudes and practices with regard to neuropsychological interest at the state level. In general, though respondents continue to report training that is lacking in neuropsychological content at the graduate school level, the percentage of school psychologists interested in receiving more training remains high. Additionally, respondents report agreement as to the relevance of a neuropsychological perspective to their work and the conditions encountered when practicing school psychology.

Despite high levels of reported interest regarding neuropsychology and an acknowledgement of the relevance of neuropsychology to school psychology, the incorporation of neuropsychological principles and the use of neuropsychological assessment instruments is not common among practicing school psychologists. Individuals with a Doctorate tend to endorse using neuropsychological principles significantly more often than school psychologists with a Master's/Specialist degree. This finding highlights the way in which the adoption of new practices may linger behind endorsements of ideas and be impacted by level of education received.

One of the more prominent ways in which the current study contributes to the literature is the way in which it clarifies the interaction of school psychologists and clinical neuropsychologists. Though school psychologists in the current study were similarly likely to either have interacted or not with neuropsychologists through referral and consultation practices, most school psychologists had received a clinical neuropsychological report regarding a student and found it to be at least moderately helpful. Ernst et al. (2008) had previously noted the dearth of studies addressing the clinical neuropsychologist/school psychologist interface, and this study at least modestly contributes to the research literature regarding this topic.

Although school psychologists have generally endorsed the relevance of neuropsychology and their interest in further training in the area, they continue to foresee barriers to the adoption of a neuropsychological perspective. Many of these potential barriers relate to well-documented training concern considerations while others relate more to practical considerations if school psychologists were to incorporate more of a neuropsychological perspective. The noted concerns have remained relatively consistent over time, perhaps reflecting legitimate barriers that are preventing the adoption of a neuropsychological perspective and practices by school psychologists.

Limitations

The current study is not without limitations. To begin, though OSPI provided the researcher with their best known listing of practicing school psychologists in Washington State, there were inaccuracies on the list, which affected the individuals who were invited

to participate in the study. Additionally, there were a few individuals for whom e-mail contacts were unable to be found as well as individuals who had previously opted not to participate in surveys from the survey distributor the researcher used. These logistical difficulties influenced the sample of school psychologists who were invited to participate in the study. As noted earlier, the percentage of individuals with doctorate degrees was smaller than what might be expected, which suggests that this group of school psychologists may be underrepresented in the current study. One must also acknowledge the inherent difficulties with survey methodology. Participants may interpret questionnaire items differently and respond accordingly. Also, it is quite possible that individuals more favorably inclined or interested in neuropsychology may have been more likely to complete the survey. However, it should be noted that the overall number of participants was quite similar to a recently completed state survey of Washington school psychologists on an entirely different topic, which may lend credence to the representativeness of the sample.

Future Directions

Given the noted interest in neuropsychology by school psychologists, which has been consistently reported in the literature, it is worth considering training paradigms that may be useful and practical for school psychologists. Training at the graduate school level appears hit or miss, and the more formal post-graduate trainings explored by this study, WSASP and the School Neuropsychology Post-Graduate Certification Program run by Dr. Dan Miller and KIDS, Inc., were attended by very few numbers of

respondents. Further exploration into the types of workshops and trainings school psychologists have participated in and what types of training is desired and practical may be useful.

Additionally, further exploration of the relationship between school psychologists and clinical neuropsychologists may prove fruitful. This study has provided a starting point for rates of referral and consultation; however, the effectiveness and working relationship between school psychologists and neuropsychologists may need to be further investigated, particularly if potential barriers for school psychologists prohibit the adoption of a neuropsychological perspective. The interaction between these two professions may prove to be an advantageous avenue for integrating neuropsychological knowledge and addressing student concerns from a neuropsychological perspective.

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APPENDIX A
SURVEY & RESULTS

Introduction & Acceptance

Please read the following information about this study and click the "I accept" button at the bottom of your screen if you are interested in participating. You must be at least 18 years old and a practicing school psychologist in the state of Washington.

This research is being conducted to learn more about Washington State school psychologists' interest in neuropsychology and incorporating a neuropsychological perspective into professional practice. If you agree to participate in the study, you will be asked demographic questions in addition to questions regarding your training, attitudes, and practices with regard to incorporating a neuropsychological perspective into professional practice. There will also be questions regarding referral and consultation with clinical neuropsychologists.

This web-based survey consists of 25 questions and will take approximately 5-10 minutes to complete. By choosing to participate, you will help expand the knowledge regarding Washington State school psychologists' interest in neuropsychology.

Your decision to participate is strictly voluntary and involves no risks. You are free to answer all or none of the questions on the survey. You may withdraw from participating at any time; to do so, you simply close your internet browser. Declining to participate will involve no penalty to you.

Data will be stored on a secure server and can only be accessed by the research team. Your responses will be anonymous; all results/findings will be reported in aggregate only. The survey will be collected via Survey Monkey, and safeguards have been taken by the researcher to maximize privacy and security options using this survey company. Reasonable and appropriate safeguards have been used in the creation of the web-based survey to maximize the confidentiality and security of your responses; however, when using information technology, it is never possible to guarantee complete privacy.

You may ask questions about the research by contacting Megan Moerke at spnpsurvey@gmail.com. You may also contact the CWU Human Protections Administrator if you have questions about your rights as a participant or if you think you have not been treated fairly. The HSRC office number is (509)-963-3115.

If you wish to participate, are at least 18 years old, and are a practicing school psychologist in Washington State, please click "I accept" at the bottom of this page.

Thank you.

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I accept. Yes = 433

Demographics

1. What is the highest school psychology degree you have obtained?
 - a. Master's = 214 (49.88%)
 - b. Specialist = 180 (41.96%)
 - c. Doctorate = 35 (8.16%)

2. Where did you complete your school psychology graduate school training?
 - a. Washington = 261 (60.98%)
 - b. Out of state = 167 (39.02%)

3. In what year did you complete your training in school psychology?
 - a. 1960's = 1 (.24%)
 - b. 1970's = 21 (5.01%)
 - c. 1980's = 57 (13.60%)
 - d. 1990's = 99 (23.63%)
 - e. 2000's = 168 (40.10%)
 - f. 2010's = 71 (16.95%)
 - g. Uncategorizable = 2 (.48%)

4. How long have you been practicing as a school psychologist?
 - a. 0-5 years = 107 (25.54%)
 - b. 6-10 years = 101 (24.11%)
 - c. 11-15 years = 68 (16.23%)

- d. 16-20 years = 60 (14.32%)
- e. 21-25 years = 38 (9.07%)
- f. 26-30 years = 24 (5.73%)
- g. 31-35 years = 14 (3.34%)
- h. 36+ years = 6 (1.43%)
- i. Uncategorizable = 1 (.24%)

5. Do you have a graduate degree in an area other than school psychology?

- a. No = 254 (59.35%)
- b. Yes = 174 (40.65%)

If NO, continue to question 6.

If YES, please specify the field in which you possess the degree and the degree type. (Results categorized by field of degree due to low numbers of participants reporting degree type. Multiple degrees reported in some instances.)

- a. Counseling = 70 (40.32%)
- b. Education = 34 (19.54%)
- c. Clinical = 26 (14.94%)
- d. Administration = 11 (6.32%)
- e. Educational Psychology = 10 (5.75%)
- f. Other Psychology = 8 (4.60%)
- g. MSW = 7 (4.02%)
- h. MFT = 4 (2.30%)
- i. Developmental Psychology = 3 (1.72%)
- j. Experimental Psychology = 3 (1.72%)
- k. Other = 13 (7.47%)
- l. N/A = 5 (2.87%)

6. How would you classify the school district in which you are employed?

- a. Urban = 98 (22.79%)
- b. Suburban = 224 (52.09%)
- c. Rural = 108 (25.12%)

Training

7. In your graduate degree program, were you required to complete a course in physiological psychology or a course emphasizing brain/behavior relationships?

- a. No = 206 (49.76%)
- b. Yes = 208 (50.24%)

If NO, continue to question 8.

If YES, please specify the name(s) of the course(s). Multiple courses reported by some participants.

- a. Neuropsychology = 67 (32.21%)
- b. Physiological Psych. = 41 (19.71%)
- c. Bio. Psych./Bio. basis of behavior = 17 (8.17%)
- d. Neurology/Neuro. = 8 (3.85%)
- e. Brain & Behavior = 7 (3.37%)
- f. Developmental Psych. = 4 (1.92%)
- g. Psychopharmacology = 4 (1.92%)
- h. Other = 13 (6.25%)
- i. Unknown/Don't Recall = 61 (29.33%)
- j. NA/Uncategorizable = 5 (2.40%)

8. In your graduate degree program, was a course with a main emphasis on neuropsychology required?

- a. No = 258 (61.87%)
- b. Yes = 159 (38.13%)

If NO, continue to question 9.

If YES, please specify the name(s) of the course(s). Multiple courses reported by some participants.

- a. Neuropsychology = 104 (65.41%)
- b. Physiological Psych. = 7 (4.40%)
- c. Bio. Psych. = 3 (1.89%)
- d. Brain & Behavior = 2 (1.26%)
- e. Neurology/Neuro. = 2 (1.26%)
- f. Other = 5 (3.14%)
- g. Unknown/Don't Recall = 33 (20.75%)
- h. NA/Uncategorizable = 4 (2.52%)

9. In your graduate degree program, was a course with a main emphasis on neuropsychology offered?

- a. Yes = 183 (44.10%)
- b. No = 232 (55.90%)

10. In your graduate degree program, were you trained to administer neuropsychological assessment instruments?

- a. Yes = 151 (36.47%)
- b. No = 263 (63.53%)

11. Were you exposed to any training related to neuropsychology during your practicum or internship experiences?

- a. Yes = 141 (33.98%)
- b. No = 274 (66.02%)

12. Please rate your level of agreement with the following statement. More training in neuropsychological principles at the graduate school level would be helpful for future school psychologists.

- a. Strongly Disagree = 17 (4.08%)
- b. Disagree = 14 (3.36%)
- c. Neither Agree nor Disagree = 35 (8.39%)
- d. Agree = 195 (46.76%)
- e. Strongly Agree = 156 (37.41%)

13. Have you taken any workshops, continuing education courses, or in-service training related to neuropsychology following completion of graduate school?

- a. No = 106 (25.48%)
- b. Yes = 310 (74.52%)

If NO, continue to question 14.

If YES, please estimate the number of trainings in which you have taken part.

- a. 1-3 = 145 (46.77%)
- b. 4-6 = 90 (29.03%)
- c. 7-9 = 8 (2.58%)
- d. 10+ = 25 (8.06%)
- e. Unknown/Don't Recall = 8 (2.58%)
- f. NA/Uncategorizable = 34 (10.97%)

14. Were you enrolled in the spring lecture series 'Introduction to School Neuropsychology' offered through WSASP?

- a. Yes = 22 (5.29%)
- b. No = 394 (94.71%)

15. Are you enrolled in or have you completed the postgraduate school neuropsychology certification program offered through KIDS, Inc. and Dr. Miller?

- a. Yes = 11 (2.64%)
- b. No = 405 (97.36%)

16. Are you interested in receiving more training in neuropsychology and neuropsychological assessment methods?

- a. Yes = 358 (86.47%)
- b. No = 56 (13.53%)

Attitudes and Beliefs Regarding Neuropsychology

Please rate your level of agreement with the following statements.

17. The incorporation of a neuropsychological perspective is relevant to the practice of school psychology.

- a. Strongly Disagree = 11 (2.65%)
- b. Disagree = 12 (2.89%)
- c. Neither Agree nor Disagree = 36 (8.67%)
- d. Agree = 210 (50.60%)
- e. Strongly Agree = 146 (35.18%)

18. There is neurological involvement in the conditions encountered by school psychologists when working with children with disabilities who are eligible for special education services.

- a. Strongly Disagree = 10 (2.40%)
- b. Disagree = 2 (0.48%)
- c. Neither Agree nor Disagree = 21 (5.05%)
- d. Agree = 202 (48.56%)
- e. Strongly Agree = 181 (43.51%)

Professional Practices Related to Neuropsychology

19. Please specify the extent to which you use neuropsychological principles when conducting assessments.

- a. Never = 23 (5.62%)
- b. Rarely = 97 (23.72%)
- c. Occasionally = 167 (40.83%)
- d. Frequently = 101 (24.69%)
- e. Very Frequently = 21 (5.13%)

20. Please specify how often you use neuropsychological assessment instruments or batteries when conducting assessments.

- a. Never = 84 (20.49%)
- b. Rarely = 154 (37.56%)
- c. Occasionally = 95 (23.17%)
- d. Frequently = 62 (15.12%)
- e. Very Frequently = 15 (3.66%)

21. Please rate how often you use the following assessments of cognitive ability and neuropsychological tests in your practice as a school psychologist.

	Never	Rarely	Occasionally	Frequently	Very Frequently
Cognitive Assessment System	70% (266)	14.21% (54)	5.53% (21)	3.16% (12)	7.11% (27)
Woodcock-Johnson III Tests of Cognitive Abilities	36.20% (143)	26.08% (103)	19.24% (76)	8.35% (33)	10.13% (40)
Wechsler Preschool and Primary Scales of Intelligence – Third Edition	51.55% (199)	22.80% (88)	17.36% (67)	4.92% (19)	3.37% (13)
Stanford-Binet Intelligence Scales: Fifth Edition	41.19% (159)	29.79% (115)	19.69% (76)	5.96% (23)	3.37% (13)
Wechsler Intelligence Scale for Children – Fourth Edition	4.20% (17)	6.91% (28)	17.28% (70)	26.42% (107)	45.19% (183)
Kaufman Assessment Battery for Children – Second Edition	50.53% (192)	17.11% (65)	12.89% (49)	7.63% (29)	11.84% (45)
Differential Ability Scales – Second Edition	31.30% (123)	20.36% (80)	18.32% (72)	10.43% (41)	19.59% (77)
Test of Memory and Learning	85.11% (320)	10.90% (41)	3.19% (12)	0.53% (2)	0.27% (1)
California Verbal Learning Test: Children's Version	94.15% (354)	4.26% (16)	1.06% (4)	0.53% (2)	0% (0)
Children's Memory Scale	87.89% (334)	7.11% (27)	4.21% (16)	0.26% (1)	0.53% (2)
Wechsler Memory Scale – Third Edition	87.89% (334)	8.95% (34)	2.89% (11)	0.26% (1)	0% (0)
NEPSY/NEPSY II	75% (285)	17.11% (65)	5% (19)	2.11% (8)	0.79% (3)
Test of Everyday Attention	95.23% (359)	3.18% (12)	1.33% (5)	0.27% (1)	0% (0)
Delis-Kaplan Executive Functions System	91.03% (345)	5.80% (22)	2.11% (8)	1.06% (4)	0% (0)
Dean-Woodcock Neuropsychological Battery	95.68% (354)	2.97% (11)	1.08% (4)	0.27% (1)	0% (0)
Wide Range Assessment of Memory and Learning	67.02% (254)	15.30% (58)	13.19% (50)	3.17% (12)	1.32% (5)

Referral & Consultation

22. Have you ever referred a student for a clinical neuropsychological evaluation?

- a. Yes = 206 (50.24%)
- b. No = 204 (49.76%)

If NO, continue to question 23.

If YES, please choose the category of disability that best fits the student(s) who was/were referred. Please mark all that may apply.

- a. Intellectual Disability = 41 (19.90%)
- b. Hearing Impairment = 3 (1.46%)
- c. Speech or Language Impairment = 19 (9.22%)
- d. Visual Impairment = 7 (3.40%)
- e. Emotional Behavioral Disability = 69 (33.50%)
- f. Orthopedic Impairment = 2 (0.97%)
- g. Autism = 104 (50.49%)
- h. Traumatic Brain Injury = 76 (36.89%)
- i. Other Health Impairment = 120 (58.25%)
- j. Specific Learning Disability = 73 (35.44%)
- k. Deaf-Blindness = 1 (0.49%)
- l. Multiple Disabilities = 33 (16.02%)
- m. Developmental Delay = 41 (19.90%)

23. In your work as a school psychologist, have you ever received a neuropsychological report regarding a student?

- a. Yes = 377 (91.95%)
- b. No = 33 (8.05%)

If NO, please continue to question 24.

If YES, please rate how helpful you found the report to be.

- a. Very unhelpful = 29 (7.71%)
- b. Moderately unhelpful = 51 (13.56%)
- c. Neither helpful nor unhelpful = 37 (9.84%)
- d. Moderately helpful = 197 (52.39%)
- e. Very helpful = 62 (16.49%)

24. Have you ever consulted with a clinical neuropsychologist regarding a student?

- a. Yes = 215 (52.44%)
- b. No = 195 (47.56%)

Barriers

25. Do you foresee potential barriers in the adoption of a neuropsychological perspective by school psychologists?

- a. Yes = 253 (62.01%)
- b. No = 155 (37.99%)

If NO, thank you for your participation; the survey is complete.

If YES, please specify potential barriers. Please mark all that may apply.

- a. Lack of training in neuropsychology at the graduate school level = 186 (73.23%)
- b. Lack of time to adequately devote to neuropsychology during school psychology training = 151 (59.45%)
- c. Lack of graduate school faculty with neuropsychological expertise = 69 (27.17%)
- d. Lack of interest in neuropsychology by school psychologists = 40 (15.75%)
- e. Lack of relevancy of neuropsychology to the field of school psychology = 38 (14.96%)
- f. Lack of practicality of neuropsychology to the field of school psychology = 111 (43.70%)
- f. Other (Please Specify) = 120 (47.24%) Multiple additional barriers reported by some participants.
 - a. Lack of Resources (\$, test kits) = 35 (29.17%)
 - b. Lack of time on the job = 35 (29.17%)
 - c. Administrator/Teacher Buy in = 17 (14.17%)
 - d. Fit with Current Qualification Model = 11 (9.17%)
 - e. Scope of Practice Concerns = 8 (6.67%)
 - f. Training for practitioners in the field = 8 (6.67%)
 - g. No additional practical benefit = 7 (5.83%)
 - h. State/Federal Regulations = 6 (5%)
 - i. RTI focus = 5 (4.17%)
 - j. Concerns with Neuropsychology as a field = 4 (3.33%)
 - k. Other = 12 (10%)